Alone Again: Revisiting Psychological Perspectives on Solitude

The experience of solitude is a ubiquitous phenomenon. Over the course of the life span, humans experience solitude for many different reasons and subjectively respond to solitude with a wide range of reactions and consequences. Some people may retreat to solitude as a respite from the stresses of life, for quiet contempla- tion, to foster creative impulses, or to commune with nature. Others may suffer the pain and loneliness of social isolation, withdrawing or being forcefully excluded from social interactions.

These exemplars illustrate the complex nature of solitude and its relation to well‐being – and speak to what has been deemed the *paradox of solitude*. Indeed, theorists and researchers haver highlighted several different paradoxi- cal aspects of solitude over the years, including: (1) despite the widely held beliefs that solitude serves self‐enhancing functions, it is often experienced as unwelcome and painful; (2) time alone can serve as both a reward (“me time”) and a punishment (time outs, solitary confinement); (3) solitude is viewed as both normative as well as a cause and consequence of psychopathology; (4) time alone can both interfere with and improve our relationships with oth- ers; and, as we will discuss in some detail herein; (5) solitude can simultaneously confer both costs and benefits for our well‐being (Coplan et al., 2018; Galanaki, 2015; Merton, 1958; Larson, 1999).

It should also be noted that there is little consensus among researchers as to how solitude should be conceptual- ized, operationalized, and assessed. For example, some perspectives emphasize *physical* separation from others, although in some cases this becomes operationalized in varied ways. For example, participants might be required

simply to sit and think away from others (Wilson et al., 2014), whereas in other studies the focus is on activities while participants are physically alone (Leary et al., 2003). Of note, there is really no agreed‐upon physical “dis- tance” from others that is mandated in order for an individual to be considered alone. Other perspectives focus on *perceived* separation from others (Larson, 1990). In this regard, participants might report feeling alone and lonely even in the presence of others (van Roekel et al., 2015). Coplan and Bowker (2017) described this conceptual dis- tinction as solitude representing a *state of mind* rather than a *state of being*. Finally, as we will discuss later, contem- porary technology now makes it possible (and common) for us to be physically alone but in the *virtual* presence of – and interacting with – many others (Hollis et al., 2020).

These different conceptualizations of solitude highlight the many different “faces” of solitude. In 2014, the *Handbook of Solitude* was the first academic volume to specifically focus on the diverse theoretical and empirical approaches to the psychological study of solitude. Since that time, there has been considerable advancement in our understanding of solitude, with novel and exciting research focusing on previously unconsidered aspects of being alone. In this second edition of the *Handbook*, we are absolutely thrilled to present a blend of new and updated chapters that approach the study of solitude from a myriad of theoretical perspectives and methodo- logical approaches, and with critically important applications for practice and policy.

In this introductory chapter, we revisit some of the critical historical components of the study of solitude, consider some of the novel issues that have emerged in recent years, and describe a broad theoretical model of the causes and consequences of solitude. We finish the chapter with an overview of the novel and updated contents of this new volume.

##### Looking Back: Solitude as Bad vs. Good

As noted above, there remain competing hypotheses regarding the nature of solitude and its implications for well‐being. Indeed, these fundamentally opposed differential characterizations of solitude represent the most pervasive theme in the historical study of solitude as a psychological construct. From its early roots through to today, researchers have sought to depict and portray solitude as inherently “bad” versus “good.” As we will see, these attempts to singularly define the implications of solitude for well‐being as an either/or dichotomy appear to represent an oversimplification of what has emerged as a much more complex phenomenon.

The notion that solitude has negative consequences has a long history and can literally be traced back to biblical times (Genesis 2:18, And the LORD God said “It is not good for the man to be alone”). For example, from an evolutionary perspective, solitude is maladaptive because social affiliations are essential to the survival of the human species, offering protection against predators, cooperative hunting, and food sharing (Barash, 1977; Hamilton, 1964; Trivers, 1971). Notwithstanding, many theorists and researchers have also long called attention to positive aspects of being alone (Middleton, 1935; Merton, 1958; Zimmerman, 1805; for a review, see Long & Averill, 2003). For example, over 300 years ago, Montaigne (1685) argued that individuals should strive for experiences of solitude not only as a respite from societal pressures, but also to free themselves from dogma, conventional ways of thinking, and the power of the group. This highlights two domains that have endured as consistently ascribed benefits to spending time alone, namely that solitude is an important and unique context for restoration (Staats & Hartig, 2004) and personal growth (Maslow, 1968).

Historical theoretical arguments regarding the costs and benefits of solitude have come from a wide range of psychological perspectives. For example, developmental psychologists have asserted that excessive solitude during childhood can cause psychological pain and suffering (Freud, 1930), damage critically important family relation- ships (Harlow, 1958), impede the development of the self‐system (Mead, 1934), and prevent children from learning from their peers (Piaget, 1926). Yet, other developmentalists have espoused the notion that solitude provides a facilitating environment for psychological maturity, self‐discovery, and self‐realization, particularly during critical periods for development such as infancy/early childhood (Winnicott, 1958) and adolescence (Larson, 1990).

Social psychologists consider affiliation with others to be a basic human need (Horney, 1945; Shipley & Veroff, 1952), and the failure to meet this *need to belong* can have profoundly negative implications for well‐being (Baumeister & Leary, 1995). Yet, social psychologists also argue that when solitude is *autonomously* motivated (i.e., derived from finding value or interest in the activity, Deci & Ryan, 2000), it is experienced more positively

and can serve as a context for self‐regulation, stress reduction, and restoration (Berman et al., 2008; Leung, 2015; Nguyen et al., 2018).

From the perspective of clinical psychology, social isolation has been traditionally viewed as a target criterion for intervention (Lowenstein & Svendsen, 1938), and as a symptom of several psychological disorders (DSM‐I; APA, 1952). Yet, it has also been suggested that creativity and artistic talents may develop in response to long periods of painful social isolation (Middleton, 1935; Storr, 1988; Thoreau, 1854).

Contemporary approaches to the psychology of solitude now acknowledge that time alone is neither inher- ently good nor bad, and that solitude has a very complex relationship with well‐being (Coplan et al., 2018). In trying to decipher these complexities, researchers have started to focus on the different *causes* of solitude, and how those causes contribute to different *consequences* of being alone. As well, we are just beginning to under- stand how *contextual* factors might impact the pathways linking the causes and consequences of solitude. In this regard, these approaches ask how, for whom, and under what circumstances, do experiences of solitude differentially contribute to costs and benefits of well‐being?

##### Looking Around: A Conceptual Model of the Causes and Consequences of Solitude

There is a myriad of factors that serve to mediate, moderate, and complicate how solitude impacts our well‐being (Coplan et al., 2018). In Figure 1.1, we have attempted to synthesize these postulations into a broad conceptual model stipulating that: (1) there are different causal mechanisms that underlie our experiences of solitude; (2) these different “reasons” for spending time alone affect the implications of solitude for well‐being; and

(3) these processes are nested within contexts that serve to further modulate the nature of these associations.

First, it is important to distinguish between instances where individuals are spending time alone as a result of external processes, motivations to avoid others, or motivations to approach solitude. External processes impose solitude upon the individual. Under these circumstances, regardless of personal inclinations, experiences of ostracism, exclusion, rejection, and/or victimization result in social isolation (Rubin, 1982). Not surprisingly, this *unwanted* solitude has negative consequences, from mundane discomfort (e.g., boredom; Wilson et al., 2014) to painful loneliness (Cacioppo & Patrick, 2008), as well as contributing to declines in both mental (e.g., depression; Williams & Nida, 2011) and physical health (e.g., cardiovascular disease; Valtorta et al., 2018). Indeed, social isola- tion and loneliness are now considered to be risk factors for mortality (Holt‐Lunstad et al., 2015).

In other cases, individuals may seek to remove themselves from opportunities for social interaction (and thus end up in solitude) as a means of avoiding social contexts perceived as stressful or unpleasant. This process has been referred to as *social withdrawal* (Rubin et al., 2009) and we construe it herein as solitude seeking motivated by the desire to avoid others. For example, from a motivational perspective, shyness has been conceptualized as arising from an approach‐avoidance conflict (Asendorpf, 1990), whereby the wish to affiliate with others (high social approach motivation) is simultaneously inhibited by social fear and socio‐evaluative concerns (Coplan et al., 2004). In this regard, although shy individuals’ solitude may be self‐imposed, it is also predomi- nantly unwelcome, and can lead to emotional distress, rumination, and anxiety (Nelson, 2013). Indeed, extreme shyness in children is now widely considered to be one of the most robust and consistent predictors of the development of clinical anxiety disorders (Clauss & Blackford, 2012).

In yet other cases, although it is widely accepted that the simple act of engaging in social interactions makes us happier (Epley & Schroeder, 2014), some individuals are higher in *social anhedonia*, reflecting a reduced capacity to derive pleasure from social interactions (Blanchard et al., 2000). This can lead to increased solitude because of feel- ings of sadness and lethargy (Coplan et al., 2015), and ultimately more serious personality and depressive disor- ders (Brown et al., 2007). As an aside, it is also important to note that *transactional* processes are likely occurring in terms of the interplay between the external process of social isolation and the internal motivation to avoid others (as depicted in Figure 1.1 via a dotted line with arrows on both ends). For example, withdrawing from opportuni- ties for social interaction may invite ostracism from others, which in turn may heighten the desire to subsequently avoid social interaction, and so on… (Ren et al., 2015; Rubin & Mills, 1988).

These scenarios all share the commonality that individuals in these groups are engaging in solitude for rea- sons that are *reactive*. It is also important to consider individuals who are more *proactive* in their selection of

solitude. In such instances, individuals are not retreating to solitude as a means of avoiding social interactions, but instead are *approaching* solitude as a desired and positive context. As mentioned previously, a key determining factor in how we experience solitude is whether it is sought out because of an intrinsic (i.e., autonomous, self‐ directed) motivation (Chua & Koestner, 2008). A number of related terms have been used to describe individual differences in the non‐fearful desire for spending time alone, including *unsociability* (Coplan & Weeks, 2010), *social disinterest* (Coplan et al., 2004), *affinity for aloneness* (Goossens, 2014), *solitropic orientation* (Leary et al., 2003), and *preference for solitude* (Burger, 1995). An affinity for solitude is also a component of the broader person- ality dimension of *introversion‐extraversion* (Eysenck & Eysenck, 1985).

Generally speaking, when solitude is chosen, spending time alone is viewed more positively and is associ- ated with more positive outcomes, including self‐regulation, stress reduction, and restoration (Berman et al., 2008; Leung, 2015; Nguyen et al., 2018). It has also been argued that spending time alone can foster self‐ growth (Long et al., 2003), spirituality (Hay & Morisey, 1978), and creativity (Csikszentmihalyi, 1996). However, it must also be noted that, regardless of the underlying reason, choosing to spend time alone can sometimes be viewed negatively by others and lead to rejection and ostracism (Coplan et al., 2013). Thus, even when affording benefits, spending time in solitude can sometimes also come at a cost.

As we have described, the different *causes* of solitude have clear implications for the potential *consequences* of spending time alone. However, in recent years, it has become increasingly clear that the nature of these associa- tions is even more complicated than we thought. This is because *contextual* effects (e.g., developmental period, culture, technology) can also alter the magnitude – and even the direction – of the links between solitude and indices of well‐being.

##### Looking Forward: Solitude in Context

*Development.* One contextual factor that has received considerable *theoretical* attention is developmental period (see Coplan, Ooi, et al., 2019, for a recent review). Indeed, researchers have long theorized that the risks associated with solitude might depend on the developmental period studied (e.g., early childhood versus middle childhood versus adolescence). In this regard, the costs of solitude are often assumed to be greater during

childhood relative to adolescence and adulthood – given the widely held notion that the young developing child requires a significant amount of positive peer interaction for healthy social, emotional, and social‐cognitive development and well‐being (Rubin et al., 2015). In addition, it is during adolescence that increasing needs for and enjoyment of privacy and solitude are thought to emerge (Larson, 1990). For this reason, it has been posited that some of the negative peer consequences often associated with social withdrawal during childhood, such as peer rejection and peer victimization, may diminish during the adolescent developmental period (Bowker et al., 2016).

However, it has also long been argued that the costs of childhood solitude may accumulate over time and that solitude at any age can foster loneliness and psychological angst, particularly if it is *externally* imposed. As mentioned previously, social needs are thought to exist in individuals of all ages, with several theories suggesting that psychological well‐being is determined by whether social needs are satisfied. For example, Sullivan (1953) posited that all individuals have social needs, but that with development, the nature of the social needs change (e.g., during early adolescence, needs for intimacy emerge), as well as the *type* of relationship required to fulfill the needs (e.g., same‐sex chumships or best friendships might satisfy needs for intimacy that emerge in early adolescence). Regardless of the developmental changes, however, Sullivan argued that if social needs were not fulfilled, significant negative self‐system and psychological consequences would ensue. Consistent with these latter ideas are research findings that have identified loneliness, at any age, as one of the strongest risk factors for psychological ill‐being (Erzen & Cikrikci, 2018). That said, there is some indication that effects of loneliness on psychological and physical health and well‐being may be the greatest among the *oldest* adults, which again suggests that developmental period might matter.

Clearly the debate as to “when” in development solitude might carry the greatest costs is yet to be resolved. Indeed, theoretical speculations in this area have outpaced the empirical work. However, it must also be acknowl- edged that the very nature of solitary experiences likely change with age. For example, young children may retreat to their rooms, engage in solitary play in the company of peers, or find themselves forced to the periphery of social groups. Although externally imposed solitude might manifest similarly at older ages (e.g., adolescents being forced to hang out alone after school; adults being left out of work luncheons and gatherings), adolescents and adults have greater control over and increased opportunities for self‐selected solitary experiences relative to chil- dren. For example, adolescents are sometimes left alone without parental supervision in their homes or are able to take themselves to places of their choosing. Adults can also choose to travel alone, engage in meditative and religious retreats, and can sometimes select relatively solitary occupations and ways to spend their free time. In contrast, there may come a time in the life of an older adult where they are significantly impeded in their abil- ity to actively seek out social contacts. It remains to be seen how these potential differences in *agency* pertain- ing to solitude across the life span speak to the relation between solitude and well‐being. Taken together, though, a thorough examination of the positive and negative faces of solitude must be undertaken with a developmental lens.

*Culture.* The more that we learn about the complex nature of solitude, the more we also come to realize that the meaning and impact of spending time alone must be considered within a broader *cultural* context. There is considerable variation across cultures in attitudes and beliefs regarding aspects of solitude (Buttrick et al., 2019). It is tempting to apply the notion of *goodness of fit* (Thomas & Chess, 1977) as a simple way to explain differences in the meaning and implications of solitude across societies and cultures. That is, if solitude is gen- erally valued or even encouraged within a given culture, then the choice to spend time alone might be rela- tively adaptative, and thus, associated with more positive outcomes because it matches or is consistent with cultural values and norms. However, and perhaps not surprisingly given the complex and multidimensional nature of solitude, it appears that the impacts of culture on the causes and consequences of solitude are extremely complex and nuanced.

For example, there is some evidence to suggest that extraversion is more strongly predictive of well‐being in Western cultures (particularly North America) than in non‐Western cultures, because of the high value placed on being outgoing and sociable in these societies (Kim et al., 2016). Similarly, shyness more strongly predicts indi- ces of negative life quality in Western as compared to East Asian cultures (Rapee et al., 2011). As well, because of

the value placed on sociability in the West, children who play alone in the presence of peers (e.g., at preschool or in the schoolyard) tend to evoke negative responses from their classmates (Coplan et al., 2013; Hart et al., 2000).

Yet, Western cultures are thought to also value independence and self‐reliance (Marjoribanks, 1994). In this regard, the personal choice to spend time alone appears to be acknowledged as a normative belief in such societies (Bowker et al., 2020), and in and of itself, a non‐fearful preference for solitude is relatively accepted by others (Nelson, 2013). However, in other cultures (e.g., China) that value devotion to interde- pendence and the collective (e.g., peer group) over the individual, the decision to remove oneself from the collective (for any reason) may be viewed as selfish and deviant (Chen, 2019), and responded to quite nega- tively (Liu et al., 2015; Liu et al., 2017; Nelson et al., 2012). But, it has also been argued that East Asian cul- tures place greater value and are more likely to encourage humble and socially unassertive behaviors, because they maintain group harmony and promote collectivistic values (Schreier et al., 2010; Xu et al., 2007). Finally, it should be noted that not all Western cultures view sociability in the same way. For example, Finish culture places a high value on quietness and the ability to be “comfortable in silence” (Berry et al., 2004, p. 270).

These are just a few examples of the complexities involved in considering aspects of solitude across cultures. It is only in understanding the cultural context for *why* a solitary behavior may be seen as adaptive or problem- atic that we begin to see the situation clearly and accurately. Thus, we need to be cautious about broadly cate- gorizing certain forms of solitude as either “good” or “bad” when, instead, it is really only by understanding the cultural context within which the solitary behavior is enacted that we that we can begin to understand *why* the behavior may be perceived positively or negatively, and more importantly, how it may lead to positive or nega- tive outcomes in the lives of individuals.

*Technology and social media.* Finally, beyond culture, there is another context that is reshaping how we think about solitude. Today, people’s social interactions are not limited to face‐to‐face encounters or to speaking on the telephone. Instead, technological advances have made computer‐mediated communication not only pos- sible but prevalent in our daily lives. Indeed, Facebook, Instagram, Snapchat, Tic Toc, FaceTime, Skype, text messaging, and numerous other platforms for computer‐mediated communication had become part of the everyday world that has expanded the way we interact on a daily basis.

As a result of this, it is absolutely essential that we examine what solitude *means* in this digital context. For example, there is no real consensus about at what point increasingly interactive technologies would render someone as no longer “alone” (i.e., scrolling through social media feeds vs. commenting and responding to posts vs. exchanging texts in real time vs. direct audio communication vs. direct audio‐visual communication). Indeed, for decades, scholars have examined individual differences in tendencies (both motivations and actual behaviors) to move toward or away from interactions in social settings. Now, the digital world in which we live demands that we expand our research to examine the meaning and impact of moving toward or away from social interaction in technologically mediated contexts.

Emerging work is already pointing to individual differences in, among other things, the use of connective forms of media (forms of media that have the *potential* to connect individuals to others such as e‐mail; Nelson et al., 2016), the extent of interaction that occurs when using digital forms of communication (e.g., how people interact on social media; Scott et al., 2018), and the role of technology in maintaining relationships (e.g., use and content of text messages between friends and romantic partners; e.g., Rideout & Robb, 2018). Just as we can identify meaning and outcomes associated with withdrawing from in‐person settings, we are starting to see that there is meaning and impact to be found in what it means to engage in solitude in the context of a digitally connected world. For example, emerging work is showing that individual differences in whether and how (i.e., competently or not) a person engages in computer‐based interactions can be linked to indices of adjustment and maladjustment (e.g., empathy, loneliness, self‐esteem, prosocial behaviors, aggression; Brody, 2018; Kim & Lee, 2011; Lapierre, 2020; Nelson et al., 2016). Taken together, it is impossible to approach a volume devoted to understanding the meaning and impact of solitude in contexts without examining it in the digital age in which we now live.

##### Overview of the New Edition of this Handbook

The chapters in this second edition of the *Handbook of Solitude* provide the reader with a mix of updated per- spectives and research on topics covered in the first handbook, as well as all new chapters examining original topics related to solitude. Although we have expanded our coverage of important topics related to solitude, we still examine solitude from multiple psychological perspectives, during different developmental periods across the life span, and across a broad range of contexts. Moreover, the contributing authors represent a “who’s who” of international experts in their related areas.

The first section of this volume focuses on theoretical approaches to understanding various aspects of solitude. The section provides a balance of perspectives that, in some chapters, examine the adaptive and beneficial aspects of solitude, with other chapters that employ a lens revealing the potentially problematic aspects of solitude. To begin, Hassan, MacGowan, Poole, and Schmidt (Chapter 2) explore the possible adaptive function of shyness from evolutionary and neuroscientific perspectives. From a very different lens, Mikulincer, Shaver, and Gal (Chapter 3) describe the contribution of attachment theory to our understanding of loneliness in the face of soli- tude. In having these two chapters open the book, the reader is immediately challenged to think about both posi- tive and negative aspects of solitude and, at the same time, the role of both biology and the environment (e.g., the family) in understanding the display of solitude, its meaning, and its impact. In their chapter, Zeytinoglu and Fox (Chapter 4) examine the effects of social deprivation and social isolation on developmental outcomes by demon- strating how work with animals (nonhuman) provide important models to understand the potential effects of deprivations in social experiences. Then, Galanaki (Chapter 5) returns the reader to a perspective that examines the benefits of solitude as she provides psychoanalytic perspectives of the solitary self, including the ability to be alone, the necessity of being alone, as well as the companionable nature of solitude. The section concludes with Chen and Liu (Chapter 6) providing a chapter that lays a foundation for the importance of considering culture as a context for solitude as they examine culture, social withdrawal, and development. Taken together, this opening section lays the conceptual framework for the rest of the book by underscoring that an examination of the good and the bad of solitude must consider the role of biology, the influence of factors in the immediate environment (e.g., family, peers), and the effect of the broader context (culture) in which solitude occurs.

The second section of the book is organized to present the study of solitude in different developmental stages across the life span spanning the years from early childhood to older adulthood. However, equally represented here is heterogeneous nature of solitude, with various different conceptualizations, types, and psychological pro- cesses related to solitude represented. Mumper and Klein (Chapter 7) examine the construct of temperament known as behavioral inhibition (the tendency to exhibit fearful/withdrawn behavior in response to unfamiliar people and novel contexts), including the genetic, biological, cognitive, and environmental risk factors associated with its development, maintenance, and links with psychopathology. Coplan, Ooi, and Hipson (Chapter 8) then explore the causes and consequences of different solitary activities in a variety of contexts (school and nonschool settings) from early childhood to adolescence. Whereas Coplan and colleagues address, among other things, aspects of solitude that youth choose to engage in, Ladd and colleagues (Chapter 9) continue the discussion of solitude in interpersonal contexts but focus on aspects of solitude that children and adolescents rarely choose. Specifically, the chapter shines light on the negative aspects of peer experiences that include rejection, exclusion, and victimization. Continuing with an emphasis on the role of experiences with peers, Bowker, White, and Etkin (Chapter 10) focus their lens specifically on the period of adolescence as they examine social withdrawal and expe- riences at both the *group* (e.g., rejection, exclusion) and *dyadic* (e.g., friendships) levels of social complexity.

Developmentally, the end of adolescence marks a change in the level of structure (e.g., oversight by adults including parents, teachers, and coaches). Given that emerging adults can now choose for themselves how much time to spend with others or in solitude, Nelson and Millett (Chapter 11) discuss how motivations to withdraw from social interactions may be tied, in positive and negative ways, to development during the tran- sition to adulthood. For an increasing number of people, this path toward and into adulthood is made as a single (e.g., not married) individual. Adamczyk (Chapter 12) provides insight into what we know about single- hood in adulthood including the multitude of reasons for singlehood and the links between singlehood and aspects of adjustment and maladjustment. Finally, our developmental coverage of withdrawal across the life

span concludes with a look by Hoppman and colleagues (Chapter 13) into solitude experienced by individuals in older adulthood.

The third section of the handbook is aimed at unpacking the complexity that is solitude. The section attempts to showcase the number of different ways to think about aspects of solitude, including different constructs, processes, and contexts, that when combined increase our understanding of the broader concept of solitude. To begin the section, Nikitin and Schoch (Chapter 14) employ the lens of social approach motivations (dispo- sitional motivation to approach positive social outcomes), and social avoidance motivations (the dispositional motivation to avoid negative social outcomes) to explain why some individuals are better able to establish and maintain satisfying social relationships than others. That is followed by Wesselmann and colleagues’ (Chapter 15) treatment of the painful experience of ostracism including the various affective, cognitive, and behavioral reac- tions to being ignored and excluded. Next, Nguyen, Weistein, and Ryan (Chapter 16) explore some of the myriad of factors that serve to shape solitary experiences, including the reasons for which we find ourselves alone, the implications of different solitary activities, and the characteristics of solitude that make it feel more true and authentic to the individual. This chapter also highlights the importance of autonomous (intrinsic) motivations in the positive experience and impact of solitude.

The next two chapters address a unique context for solitude. As noted previously, the media‐saturated world in which we now live is providing a context that is reshaping how we think about solitude. In exploring the darker side, as it were, of media, Kim (Chapter 17) examines the bidirectional links between problematic use of media and psychological maladjustment with an emphasis on loneliness. Burnell, George, and Underwood (Chapter 18) then highlight how new media has the potential to connect us to others as well as to isolate us from others by focusing on social networking sites and mobile phones and their relation to young people’s social adjustment and maladjustment. Continuing with the notion that solitude has both the potential for good and bad, Paulus, Kenworthy, and Marusich (Chapter 19) explicate how finding the right balance between being alone and being together can promote creativity, and Eccles, Kazmier, and Ehrhart (Chapter 20) look into the world of highly skilled athletes to show how solitude can be a means of rest that has benefits in sport performance and well‐being. The section then concludes by reminding us once again that context matters in our understanding of solitude. Xu and colleagues (Chapter 21) make it poignantly clear that solitude may be experienced uniquely for immigrants who have to constantly deal with the negative biases and stereotypes associated with foreign languages and accents, experiences of acculturation, perpetual foreigner stereotypes, and intergroup anxiety between immi- grant and non‐immigrant groups. Taken together, this section provides a clear reminder that to understand soli- tude’s meaning and impact, we must consider a variety of constructs (e.g., motivations, needs, ostracism), contexts (e.g., peer group, media, sports), and outcomes (e.g., creativity, loneliness, rest, anxiety) related to solitude.

The fourth section of the book focuses on the strong, and oftentimes complicated links between solitude and mental health. Although several chapters in the earlier sections describe findings pertaining to solitude and psychological outcomes, the chapters in this section are unique in their special emphasis not only on individual characteristics (including specific psycho‐social difficulties), but also on contexts that can influence when soli- tude leads to mental health difficulties and psychopathology or confer benefits. In the first chapter in this sec- tion, Zelenski, Sobocko, and Whelan (Chapter 22) explore commonly held beliefs about the links between *introversion*, extraversion, and happiness. Korpela and Staats (Chapter 23) describe the ways in which time spent in nature can be restorative for mental health and well‐being. Leavitt, Butzer, Clarke, and Dvorakova (Chapter 24) provide a detailed discussion about the importance of solitude during the increasingly popular and therapeutic practice of mindfulness meditation. The next two chapters return to a consideration of timely and important individual characteristics related to solitude, with a focus on *autism* by Baczewski and Kasari (Chapter 25) and *social anxiety disorder* by Alden and Fung (Chapter 26). The remaining chapters in this section focus on unique contexts that profoundly impact, for better or worse, experiences of solitude and aloneness and their associations with mental health. Wong and Li (Chapter 27) offer in‐depth cultural analysis of *hikiko- mori*, a phenomenon first discovered in Japan wherein individuals retreat into solitude in their residences for six months or longer, with an emphasis on a novel intervention effort in Hong Kong. In the final chapter in this section, Haney (Chapter 28) examines the unique context of solitary confinement within the United States’ prison system, with a fascinating discussion of the ways in different aspects of context (the larger prison system,

the nature of solitary confinement) come together to lead to considerable suffering and psychopathology in an already vulnerable population of inmates. Taken together, the chapters highlight the important contributions of both the individual and the context for research and clinical intervention and prevention efforts.

In the final chapter of the book, we are extremely pleased to include a unique and personal historical per- spective on the genesis of a central research area related to solitude. In this chapter, Kenneth Rubin (Chapter 29) describes the development of his innovative and highly influential research program on social withdrawal dur- ing childhood. This seminal work began in the 1970s with the novel notion that if children and adolescent benefit from social interactions, relationships, and group involvement, youth who fail to interact with peers might struggle considerably across numerous domains. This initial idea proved to be correct, and as a result, led to the creation of a brand‐new area of research, *childhood social withdrawal*, of which Rubin is widely regarded as a founder. The three editors of this handbook were all fortunate to work with Ken as his graduate students, an experience for which we are eternally grateful. Thus, it is fitting that we conclude this handbook with his deeply personal account of his research career as it not only influenced our research careers but also the research careers of many of the authors in this book and those who will be reading this handbook as gradu- ate students or senior academics.

##### Concluding Thoughts: Getting Solitude “Just Right”

As we have seen, we still have much to learn about the nature of the complex links between solitude and well‐ being. Moving forward, we would assert that we should aim for *balance* in this discussion. That is, solitude is not a one *size fit all* phenomenon – and as a result – we should be careful how we advocate its implementation. As an example of how to think about the implementation of such a complex construct, Coplan, Zelenski, and Bowker (2018) likened the effects of solitude on well‐being to spending time in direct *sunlight*. In this regard, experiencing at least some sunlight on a regular basis is probably good for all of us (e.g., source of vitamin D), but also particularly important for some of us (e.g., those with Seasonal Affective Disorder). However, the opti- mal time that we spend in the sun differs across individuals (e.g., some people get sunburned more easily than others), and chronic overexposure puts all of us at increased risk for negative consequences (e.g., melanoma).

Importantly, this suggests that there are potentially negative implications for both getting too much soli- tude – but also – and importantly – for not getting enough solitude (Coplan, Hipson et al., 2019). Ultimately, it appears that our experiences of solitude may be subject to the *Goldilocks Hypothesis*. As it applied to bowls of chairs, porridge, and beds, the Goldilocks Hypothesis asserts that there is an optimal amount (“just right”) of exposure to certain circumstances or experiences for positive effects to occur that is specific to each individual (e.g., Coplan et al., 2019; Kagan, 1990; Kidd et al., 2014; Przybylski & Weinstein, 2017). Accordingly, the chap- ters in this handbook have helped shed light on the biological, environmental (e.g., family, peers), and contex- tual (e.g., culture) factors that contribute to what determines the amount and type of solitude that is “just right” for any individual.

Indeed, we would like to thank the contributing authors for their thought‐provoking and insightful chapters. We hope that the content of the volume will be of benefit to readers who are trying to utilize the potential benefits in their own lives. Also, we are hopeful that the chapters will further stimulate research related to our understanding of the causes and consequences of solitude.

# Evolutionary and Neuroscientific Perspectives on Adaptive Shyness

Shyness reflects inhibition and anxiousness in social situations, and has been conceptualized as an emotion as well as an enduring characteristic of one’s personality (see Jones et al., 1986). Although shyness is a ubiquitous phenomenon that is observed across development, with estimates exceeding 90% of individuals experiencing it at some points in their lives (Zimbardo, 1977), a smaller percentage of children (~10–15%; Kagan, 1994) and adults (< 40%; Pilkonis, 1977) are characterized as dispositionally or temperamentally shy. Temperamental shy- ness is associated with a number of distinct physiological correlates of stress‐vulnerability, including greater relative right frontal EEG activity, high and stable heart rate at rest, and high morning basal cortisol levels (see Kagan et al., 1988; Schmidt & Miskovic, 2014; Schmidt & Schulkin, 1999, for reviews). Interestingly, these same distinct patterns of resting physiology have been identified in other mammals, including timid and cautious nonhuman primates (see Shackman et al., 2013), suggesting that temperamental shyness may be conserved across mammals. Temperamental shyness also has been linked to a range of internalizing problems (Findlay et al., 2009), but primarily social anxiety (Heiser et al., 2003; Hofmann et al., 2006; Poole et al., 2017). However, we know that not all individuals who are shy experience maladjustment. Some individuals who are shy appear to adapt reasonably well (Schmidt et al., 2017; Tang et al., 2017).

Shyness is an inherently interesting phenomenon to study, not only because of its ubiquity, but because social interaction and social connection are so fundamental to human existence, raising questions regarding the function of shyness and what purpose(s) it serves (see Schmidt & Poole, 2020a). In this chapter, we explore this broader question from evolutionary and neuroscientific perspectives. To this end, we address three specific questions organized around the broader former question: (1) Are there adaptive functions of shyness? (2) What are some of the regulatory mechanisms of adaptive shyness? and (3) How are these self‐regulatory mechanisms instantiated in the brain in adaptive shyness?

### Are There Adaptive Functions of Shyness?

Temperaments are early-emerging, biologically based, and stable traits that can provide individuals with diverse behavioral strategies that allow them to gain access to resources, reproduce, and coexist within a social hierarchy (Kagan, 1994). The shy-bold continuum, for example, is commonly observed in nonhuman animal species of fish, birds, and mammals (Wilson et al., 1994). Within this continuum, some individuals are more biologically inclined to exhibit risk‐taking behavior and approach toward novel stimuli (i.e., bold behavioral strategy) whereas others will display fear and avoidance in response to unfamiliar objects,

individuals, and situations (i.e., shy behavioral strategy; Groothuis & Carere, 2005; Koolhaas et al., 1999; Wilson et al., 1994). Similarly, temperamental behavioral inhibition can be assessed in humans, with these observed tendencies being evident from infancy throughout development (Kagan, 1994). While behavioral inhibition and the shy-bold continuum tend to focus on the extent to which an individual experiences approach or avoidance motivations toward any unfamiliar stimulus, there are also individual differences in responses to unfamiliar stimuli that are of a social nature. Specifically, some individuals will exhibit bolder behaviors with social conspecifics while others tend to experience fear and anxiety when interacting with unfamiliar social partners and when encountering new social situations (see Schmidt & Schulkin, 1999, for a review). Although both responses can be viewed as adaptive, wariness and fear are not always acknowledged to have value in our evolutionary past or in more recent human history. Given how conserved the shy‐bold continuum and phenotype appear to be across a range of animal species, it likely has served an important function to species’ survival throughout evolution.

##### Fearful and Self‐Conscious Shyness

Shyness has been described as a social ambivalence in which both approach and avoidance motivations are experienced simultaneously and in conflict (Asendorpf, 1990; Coplan et al., 2004; Lewis, 2001). However, the degree to which each of these motivations is experienced varies across individuals. There is empirical support for heterogeneity within shyness and shy expressions across a range of measures in toddlers (Eggum‐Wilkens et al., 2015), young children (Poole & Schmidt, 2019c, discussed further later in the chapter), and adults (Bruch et al., 1986; Santesso et al., 2006; Schmidt & Robinson, 1992). For example, individuals who experience heightened avoidance motivations within this motivational conflict are thought to possess an evolutionarily older phenotype known as *fearful shyness,* which tends to emerge relatively early in human development. This type of shyness reflects a heightened sensitivity to social threat and emerges with the onset of stranger fear (i.e., 6–12 months of age; Buss, 1986a,b). Fearful shyness appears to have evolved from a basic fear system to protect individuals from possible physical harm by unfamiliar conspecifics (Schmidt & Poole, 2019). In sup- port of this subtype, there is evidence for a high degree of individual variation in fear responses in mammals (Boissy, 1995), and this variation is evident early in life and is associated with different physiological and behav- ioral correlates (see Schmidt & Schulkin, 1999, for a review). In all, fearful shyness reflects a dominating moti- vation for an avoidance reaction to social stimuli and can be seen as a temperamental disposition that is evident from infancy.

In contrast, *self‐conscious shyness* reflects a motivation for both approach and avoidance, is expressed later in development (Buss, 1986a,b), and is assumed to have evolved later in human history (Schmidt & Poole, 2019). This type of shyness has been thought to emerge with the evolution of self‐awareness and other‐understand- ing. As such, self‐conscious shyness does not develop in human children until the preschool years at which time self‐awareness is evident (Schmidt & Poole, 2019) and children can take on the perspectives of others (e.g., Wellman & Liu, 2004). Self‐conscious shyness has been found to be unrelated to fearful shyness (Eggum‐ Wilkens et al., 2015) as it is associated with less fear of physical harm and more fear of negative social evalua- tion, threat to the ego, and social rejection or exclusion (Schmidt & Poole, 2019). This shyness subtype may have evolved in line with selective pressure for behaviors that aid in securing strong human relationships for the purposes of protection, support, and access to reproductive opportunities (Buss, 1999; Gilbert, 1989). Since failure to gain access to these important social resources can result in rejection and loss of social status, preoc- cupation with self‐generated behaviors in the form of self-conscious shyness can be seen as a method for moni- toring an individual’s impression on social conspecifics (Gilbert, 2001).

Fearful and self‐conscious shyness can be evaluated in humans by monitoring facial expressions during avoidance behaviors, such as gaze and head aversions (Asendorpf, 1990). In particular, *nonpositive shyness*, which occurs when an avoidant behavior is exhibited during a neutral or negative facial expression, largely expresses fear and discomfort rather than pleasure (Asendorpf, 1989; Colonnesi et al., 2014). Although not all nonpositive expressions of shyness are inherently fearful, this shyness subtype is conceptually linked to fearful shyness (e.g., Schmidt & Poole, 2019). In contrast, *positive shyness*, which is evident when a smile is

present before or during an avoidant behavior, suggests a motivation for both approach and avoidance (Reddy, 2005; Thompson & Calkins, 1996). This expression of shyness has been commonly referred to as a “coy smile,” which involves the highest level of arousal in the smile being immediately followed by a gaze or head aversion (see Colonnesi et al., 2013; Nikolic et al., 2016). Although self‐consciousness is not always dis- played in a positive manner, positive shyness is conceptually linked to self‐conscious shyness (e.g., Schmidt & Poole, 2019).

In general, self‐conscious shyness may lead to positive facial expressions during shy episodes, which can have many adaptive consequences within social interactions. In contrast, fearful shyness may generally lead to non- positive (i.e., negative and sometimes neutral) facial expressions during shy episodes, which do not grant the same benefits. It is important to note that these shyness subtypes are not mutually exclusive within individuals. Some people may exhibit high or low levels of both self‐conscious shyness and fearful shyness (i.e., high levels of positive and nonpositive shyness, respectively) or higher levels of one or the other. For the remainder of the chapter, there are times when we use fearful shyness interchangeably with nonpositive shyness, and self‐ conscious shyness interchangeably with positive shyness. As we discuss later in the chapter, part of our research program has been directed toward attempting to distinguish among these multiple subtypes and uses on a conceptual and biological level.

##### Adaptive Aspects of Shyness Subtypes

We argue that self‐conscious shyness may be currently more adaptive than fearful shyness, but this claim of course depends on the context in which it is expressed. Although there appear to be adaptive functions to both shyness subtypes, fearful shyness was likely useful in our evolutionary past when unfamiliar social conspecifics were considered physically dangerous. In contrast, self‐conscious shyness appears to be more salient in our cur- rent social environment as the nature of our social interactions have become more complex. It is also possible that fearful shyness serves an adaptive function in current human history, such as in the case of “stranger danger”, and that high levels of self‐consciousness could critically deter an individual from successfully engag- ing in social interaction. However, we argue that moderate to low levels of self‐conscious shyness are more adaptive in most current social situations when compared to fearful shyness and characteristics of extreme self‐consciousness.

For example, the *Emotional Reactivity Hypothesis* (ERH) states that less fearful temperaments better allow for the evolution of more sophisticated social processing and understanding. This hypothesis has been explored in canines (Hare, 2007; Hare & Tomasello, 2005) and children (LaBounty et al., 2017; Lane et al., 2013; Wellman et al., 2011) and pertains to social cognition: one of many traits known to increase social sophistication in humans, primates, and other mammals (Hare, 2007). Social cognitive skills, such as Theory of Mind, allow individuals to make social judgments through inferring others’ thoughts, feelings, and beliefs. Better Theory of Mind ability has been found to be positively related to positive shyness while there is evidence to suggest that nonpositive shyness is negatively related to this social cognitive skill (Colonnesi et al., 2017; MacGowan et al., 2021). These findings suggest that, over time, less fearful forms of shyness (i.e., positive shyness) may have been selected for as the complexity of human social systems increased. Another adaptive aspect of positive shyness is its potential to increase interpersonal liking and inspire affiliative and prosocial behaviors in others (Colonnesi et al., 2014; Keltner et al., 1997).

It has been argued that individuals who engage in higher levels of positive shyness are likely to gain self‐ esteem from effectively dealing with social challenges and are presumed to learn more from social situations (Thompson & Calkins, 1996). As well, positive shyness among humans and other species may allow for addi- tional time for the individual to learn about and reflect on a conspecific’s motives or intentions before acting and committing to approach‐ or avoidance‐related social behaviors (Schmidt & Poole, 2019). Interestingly, these coy behaviors have been documented in other species (McNamara et al., 2009) and are thought to signal interest while gaining more information regarding the social conspecifics that are present and the safety of the social environment (Candolin, 2003; Wachtmeister & Enquist, 1999).

Work examining positive shyness has also suggested that these expressions might act as an appeasement signal to potentially dominant or threatening social partners. In other primates with similar social systems,

such as chimpanzees and macaques, teeth baring is thought to signal appeasement and affiliation to others (see Parr & Waller, 2006). In humans, some have viewed positive shyness as a placation behavior for real, imag- ined, or imminent social breaches (Keltner & Anderson, 2000; Keltner et al., 1997). Thus, positive expressions of shyness may allow for cautious and low‐risk interaction that involves simultaneous appeasement displays. Some shy behaviors that are associated with appeasement include blushing, head aversion, and gaze aversion. Blushing, which has been found to occur more in children who exhibit high levels of positive shyness (Nikolić et al., 2016), is a physiological reaction to social evaluation and signals that the individual is perceptive to pos- sible social judgments and social norms. Similar to a general expression of positive shyness, blushing conveys that the individual is sensitive to a possible social violation and therefore exhibits appeasement (Castelfranchi & Poggi, 1990; de Jong, 1999; Keltner & Buswell, 1997). Such a reaction has been thought to signal trustworthi- ness and prosocial behavior (Dijk et al., 2009; Dijk et al., 2011) and in turn is likely to reduce negative evaluation from others (de Jong, 1999). Gaze aversions have also likely evolved as appeasement mechanisms as they are thought to be signals of submission to more dominant individuals (Terburg et al., 2012; Van Honk & Schutter, 2007).

In all, low to moderate levels of self‐conscious shyness appear to have many adaptive functions in current human history. Although fearful shyness may be currently useful in some specific contexts, this subtype was likely more adaptive in our evolutionary past when unfamiliar individuals were more likely to be physically threatening. Self‐conscious shyness (i.e., positive shyness) can provide appeasement and affiliative signals to others while simultaneously providing the individual with more time to gather information regarding the given social situation. Positive shyness can protect the individual from social rejection and threat to the ego while aiding in gaining access to social and nonsocial resources. Finally, the development of smiling as seen in positive shyness has been thought to be related to physiological processes of arousal. Namely, expressions of positive shyness in early childhood, and even infancy, might exist to reduce arousal during social interaction while simultaneously engaging with another person by holding their interest and attention (Sroufe & Waters, 1976). We discuss the regulatory functions of positive shyness further in the next section on self‐regulation in the context of shyness.

### What Are Some of the Regulatory Mechanisms of Adaptive Shyness?

Self‐regulation is one critical factor that has been heavily implicated in our understanding of shyness in general, and adaptive shyness in particular. Self‐regulation has been long regarded as a key component of temperament and personality (Posner & Rothbart, 2000; Rothbart & Bates, 1998). Broadly defined, self‐regulation encom- passes the behavioral, physiological, cognitive, and affective processes that serve to modulate reactivity in order to support goal‐directed behavior (Hofmann et al., 2012). Self‐regulation is hypothesized to emerge in early infancy through increased control over orienting responses (Harman et al., 1997; Johnson et al., 1991) and con- tinues to develop throughout the life span, displaying especially rapid development during the early preschool years (Eisenberg et al., 2004; Kopp, 1982).

##### Self‐Regulation and Shyness

Self‐regulation has been frequently implicated in the development and maintenance of shyness. As early as the first year of postnatal life, infants display individual differences in inhibition toward social and nonsocial novelty (Calkins et al., 1996; Kagan, 1994; Rothbart, 1988). It has been suggested that self‐regulatory capacity may lead to individual differences in behavioral inhibition (wariness in response to novelty, a proposed antecedent of shyness), such that low levels of self‐regulation may be associated with relatively higher levels of behavioral inhibition in the context of high negative reactivity (e.g., Rothbart, 1988; Rothbart & Bates, 1998). In support of this theory, shyness in adulthood has been cross‐sectionally associated with low regulation and high negative reactivity (Eisenberg et al., 1995), and longitudinally in childhood, high levels of inhibitory control (one com- ponent of self‐regulation) at 42 months was negatively associated with the trajectory of shyness over 3.5 years (Eggum‐Wilkens et al., 2016).

In addition to contributing to the development of shyness, some researchers have even proposed a distinct subtype of shyness in which regulation is of critical importance. For example, Xu and his colleagues have sug- gested that “regulated shyness” is observed in Chinese children and is culturally‐linked to the display of social restraint and modesty in order to maintain social harmony (Xu et al., 2007, 2008, 2009). It is possible that posi- tive shyness in North America functions similarly to regulated shyness in China. Specifically, both positive and regulated shyness appear to be associated with regulatory mechanisms, and both may represent more socially acceptable forms of shyness compared to nonpositive or anxious shyness.

Typically, children’s ability to self‐regulate is conceptualized as a positive attribute, regarded as critical for optimal development across functional and socioemotional domains. For example, high levels of self‐regula- tion are known to predict positive social functioning (Eisenberg et al., 1995) and academic success (Graziano et al., 2007; Ponitz et al., 2009), whereas poor self‐regulation has been linked to behavioral problems and mental illness across the life span (Gross & Munoz, 1995). Despite these positive aspects of self‐regulation, some have suggested that there may be individual differences in the adaptiveness of self‐regulation depending on tempera- mental factors (see Henderson, 2010; Henderson & Wilson, 2017; and Thompson & Calkins, 1996, for reviews). Some studies have found an interaction between shyness and aspects of self‐regulation when examining socioemotional outcomes. For example, in a sample of preschool‐aged Italian children in the school context, shyness was negatively associated with teacher‐reported prosocial behavior and popularity when preschoolers exhibited higher levels of inhibitory control, but positively associated with regulated school behaviors when children displayed lower levels of inhibitory control (Sette et al., 2018). In a separate sample of preschoolers, behavioral inhibition was positively associated with social anxiety and low social initiative only in the context of high inhibitory control (Thorell et al., 2004). Others have found a similar pattern of results when examining behavioral inhibition, inhibitory control, and anxiety in early childhood. For example, White and colleagues found that, in a sample of preschoolers with high inhibitory control, behavioral inhibition in toddlerhood increased the risk for anxiety problems in early childhood (White et al., 2011). In this same study, behavioral inhibition in toddlerhood increased the risk for anxiety problems for preschoolers with low attentional shifting. White and colleagues speculated that different aspects of self‐regulation differentially influence risk for anxiety symptoms in children with high behavioral inhibition, such that high attentional shifting serves as a protective

factor and high inhibitory control serves as a risk factor.

Neural correlates of attentional shifting also have been shown to moderate the association between shyness or behavioral inhibition and socioemotional adjustment in much the same way. When individuals displayed neural correlates (e.g., N2 event–related potential response) associated with relatively strong attentional and cognitive control, shyness was positively associated with socioemotional maladjustment (e.g., Henderson, 2010; McDermott et al., 2009). This pattern of results suggests that different aspects of self‐regulation (i.e., inhibitory control and attentional shifting) may have different consequences for shy children across different domains of functioning (e.g., social adjustment, academic adjustment, psychopathology).

Our group has found a similar pattern of behavioral results using temperamental inhibitory control and attentional shifting to better understand the relation between shyness and observed social behavior in two dif- ferent social laboratory contexts in a sample of preschoolers (Hassan et al., 2020). We were interested in chil- dren’s attempts at seeking social support from a relatively familiar experimenter during a frustration task where children were precluded from gaining access to a desirable toy. We also assessed children’s social engagement during a stranger approach task when a novel experimenter entered the room and attempted to engage with the child using a standardized script (Goldsmith et al., 1995). We found that attentional shifting, but not inhibi- tory control, moderated the association between shyness and social support seeking during the frustration task and social engagement during the stranger approach task. More specifically, we found shyness was only nega- tively associated with social support seeking and social engagement when individuals displayed relatively high levels of attentional shifting, and was unrelated to social behavior when individuals exhibited relatively low levels of attentional shifting.

These results provide support for the idea of heterogeneity in both self‐regulation and shyness. Although self‐regulation is often conceptualized as an adaptive characteristic, there may be individual differences in the adaptiveness of high levels of self‐regulation in fear‐based temperamental styles such as shyness (Eisenberg et al., 1995; Graziano et al., 2007; Gross & Munoz, 1995; Ponitz et al., 2009). Similarly, although shyness is often conceptualized as avoidance in novel social contexts, our results suggest that not all shy children display reluc- tance to engage in social situations, and some of this heterogeneity may depend on children’s temperamental self‐regulation (Kagan et al., 1987, 1988).

##### Self‐Regulation and Adaptive Shyness Subtypes

In addition to functioning as an important moderator between shyness and socioemotional outcomes, self‐ regulation can also inform our understanding of different subtypes of shyness (e.g., positive and nonpositive expressions of shyness). As highlighted previously, individuals who display positive affect in conjunction with shy‐related behaviors (i.e., positive shyness) are thought to be distinct from individuals who display primarily negative or neutral affect in conjunction with shy‐related behaviors (i.e., nonpositive shyness).

In infancy, positive shyness has been most commonly identified through infants’ expressions of a coy smile (Colonnesi et al., 2013; Reddy, 2000). Behaviorally, coy smiles include the presence of a smile paired with gaze and/or head aversion that occurs before or during the decline of the peak of the smile (Colonnesi et al., 2013). In infants, coy smiles are most often observed in the presence of a stranger (Colonnesi et al., 2013) and the presence of positive and negative shyness (i.e., nonpositive shyness) continues to be distinguishable during toddlerhood (Colonnesi et al., 2014) and childhood (Poole & Schmidt, 2019a). As well, the degree to which children engage in each type of expression of shyness appears to be associated with different socioemotional outcomes. As highlighted previously, positive shyness is associated with more positive outcomes when com- pared to nonpositive expressions of shyness. In both toddlerhood and childhood, positive shyness is associated with more sociability and less anxiety, while nonpositive shyness is associated with less sociability, more social anxiety, and greater behavioral manifestations of fear during self‐presentation tasks (Colonnesi et al., 2014; Poole & Schmidt, 2019a). Taken together, these studies suggest that: (1) different subtypes of shyness are distinguishable as early as infancy; (2) children who display more positive shy expressions may experience reduced risk for socioemotional difficulties; and (3) children who engage in relatively high levels of positive shy expressions may be indistinguishable from non‐shy children in some respects (Poole & Schmidt, 2019a).

One proposed explanation for why these distinct subtypes of shyness are associated with different outcomes is self‐regulation. It has been suggested that displays of positive affect in conjunction with avoidance related behaviors may function to regulate an individual’s arousal levels in novel social situations such that displays of positive affect may allow for modulation of arousal while children remain oriented toward novel social stimuli (Colonnesi et al., 2014; Poole & Schmidt, 2019a; Sroufe & Waters, 1976). In support of this notion, Asendorpf (1990) noted that within a coy smile, gaze aversion tends to occur during the most communicative part of the smile, suggesting that the smile may act as a regulatory mechanism by modulating one’s internal milieu. Moving forward, it would be helpful to determine whether positive and nonpositive shyness are in fact differ- entially related to level of self‐regulation, and whether individual differences in temperamental self‐regulation influence the development and maintenance of positive and nonpositive expressions of shyness.

Taken one step further, it would be interesting to determine whether different aspects of self‐regulation (e.g., inhibitory control, attentional shifting) work to moderate the association between positive and nonposi- tive shyness and social behavior or clinical outcomes similarly to when shyness is treated as a homogenous construct. Finally, using evolutionary frameworks such as *differential susceptibility* to guide future studies and analyses may provide us with valuable information about the multiple contexts that may support adaptive functioning in both positive and nonpositive expressions of shyness (Belsky & Pluess, 2009; see also Schmidt & Miskovic, 2013).

### How Are These Self‐Regulatory Mechanisms Instantiated in the Brain in Adaptive Shyness?

Although the origins of shyness are multifaceted, interest in the neurobiological foundations of shyness has received considerable attention over the past several decades (see, e.g., Fox et al., 2001, 2005; Kagan et al., 1987, 1988; Schmidt & Schulkin, 1999, Schmidt & Miskovic, 2013, 2014, for reviews). This has been fos- tered by the availability of theoretical frameworks for understanding nonhuman animal and human brain‐ behavior relations as well as advancements in technologies that have allowed for the relatively noninvasive collection of electrical brain activity such as electroencephalography (EEG). This combination has positioned researchers well to study the neural substrates underlying shyness, and how these neural processes may medi- ate adaptive and nonadaptive behaviors associated with shyness.

##### Frontal Brain Asymmetry and Shyness

One of the most widely studied neural correlates of shyness and related phenomena is frontal brain EEG alpha asymmetry. This work is rooted in motivational models of frontal brain activation, which have described rest- ing state frontal brain alpha asymmetry as a trait‐like measure (i.e., a biological diathesis) that is stable across time and context (see Coan & Allen, 2004; Davidson, 2000; Fox, 1991, 1994; Reznik & Allen, 2018, for reviews). According to this framework, greater relative activity in the left frontal brain region is presumed to facilitate approach‐related motivations and emotions such as sociability and happiness, whereas greater relative activity in the right frontal region has been implicated in avoidance‐related motivations and emotions such as shyness and fear (Reznik & Allen, 2018).

Researchers have used EEG‐based data to derive asymmetries of frontal brain activity and the frontal activa- tion motivational model as a theoretical platform to test hypotheses related to individual differences in tem- perament (including shyness and related constructs) and affective style across development (see Schmidt & Miskovic, 2014, for a review). Typically, these studies examined frontal asymmetry as the difference in EEG alpha power in the right frontal hemisphere *minus* EEG alpha power in the left frontal hemisphere. Because EEG alpha power is inversely related to cortical activity, negative scores reflect greater relative right frontal brain activity (Tomarken et al., 1992).

During different developmental periods, researchers have provided support for the relation between right frontal asymmetry and social avoidance‐related tendencies. For example, in infants and children, resting right frontal asymmetry has been associated with behavioral inhibition and emotional reactivity (Calkins et al., 1996; Davidson & Fox, 1989; Fox & Davidson, 1987; McManis et al., 2002), which are the temperamental antecedents of shyness. In preschool children, those described as socially inhibited and withdrawn during interactions with peers show right frontal asymmetry at rest (Fox et al., 1996), as do temperamentally shy children (Poole et al., 2018, 2019; Theall‐Honey & Schmidt, 2006). In adults, higher levels of behavioral inhibition, shyness, and social anxiety also have been linked to right frontal asymmetry at rest (Moscovitch et al., 2011; Schmidt, 1999; Sutton & Davidson, 1997) and increases in right frontal brain activity in responses to social stress in adults (Davidson, et al., 2000) and children (Schmidt et al., 1999).

##### Adaptive Subtypes of Shyness in the Brain

An additional line of our research has been to examine the neural substrates of different subtypes of shyness in children that are presumed to have different adaptive functions. As mentioned earlier in the first section, we have been particularly interested in different subtypes of shyness that share conceptual overlap, such as fearful/ nonpositive shyness and self‐conscious/positive shyness, as they appear to have different adaptive functions. We have recently explored each of these two different conceptualizations of shyness in two separate studies to determine whether we could distinguish them on resting brain‐based measures.

In Study 1, we classified children with early‐developing (fearful) shyness and a later‐developing (self‐con- scious) shyness. We found that children with later‐developing shyness had the highest relative salivary cortisol

response (a measure of stress reactivity; Schulkin et al., 2005) in the context of self‐presentation, the highest levels of embarrassment, and the lowest social skills according to parent‐ and teacher‐report, whereas children with early‐developing shyness displayed the highest relative resting right frontal brain asymmetry (a neural cor- relate of fear and avoidance) relative to the other groups (Poole & Schmidt, 2019c). In line with Buss’ (1986a,b) hypotheses, this provides partial support that early-developing shyness may be maintained by a sensitivity toward experiencing fear, whereas later‐developing shyness may be more closely related to self‐conscious emotions.

In Study 2, we examined resting state EEG measures in children with positive shyness, nonpositive shyness, and low overall shyness. We operationalized positive shyness as the display of shy behavior (e.g., avoidance) and positive affect (e.g., smiling), whereas nonpositive shyness is the display of shy behavior without positive affect (Poole & Schmidt, 2019a, 2020a). As mentioned above, positive shyness has been regarded as an adaptive, approach‐dominant subtype of shyness (see Poole & Schmidt, 2020b, for a recent review).

Similar to Study 1, we first examined resting state frontal EEG asymmetry among children classified as posi- tive shy, nonpositive shy, and low shy (Poole & Schmidt, 2020a). Our results revealed that children classified as nonpositive shy displayed greater relative resting right frontal EEG activity, whereas children classified as posi- tive shy and low shy displayed greater relative resting left frontal EEG activity (a neural correlate of approach). These findings converge with studies that have examined psychosocial correlates of approach‐avoidance in these subtypes, extending this work to a neural measure. It may be the case that children who display more positive shyness exhibit an underlying biological diathesis for approach as reflected by greater relative left fron- tal brain activity at rest, which could facilitate approach behaviors in social situations and yield the benefits of such social interactions, including social engagement and competence.

In Study 2, we also examined frontal EEG delta‐beta correlation among these shyness subtypes (Poole & Schmidt, 2020a). Delta‐beta correlation is thought to reflect the efforts of regulatory networks to down regu- late arousal in the subcortical networks (Knyazev & Slobodskaya, 2003; Schutter & Knyazev, 2012) and thus some researchers have conceptualized delta‐beta correlation as a proxy for adaptive emotion regulatory abili- ties. Our results revealed a relatively higher frontal delta‐beta correlation among the positive shy children com- pared to the nonpositive shy and low shy children (Poole & Schmidt, 2020a). As stated above, positive shyness is hypothesized to emerge from the simultaneous feelings of arousal and regulation in social situations (Colonnesi et al., 2014; Colonnesi et al., 2017; Nikolić et al., 2016; Poole & Schmidt, 2019a), and thus it is pos- sible that the positive shy children display greater synchrony of delta and beta oscillations as reflected by stronger delta‐beta correlation due to their efforts to regulate feelings of arousal.

##### Frontal Brain Maturation and Adaptive Shyness

In order to further understand the adaptive function of shyness, we recently have begun to investigate whether frontal brain *maturation* may be related to shyness in childhood given that the frontal cortex is involved in the regulation of behavior (Fox, 1994; Passler et al., 1985) and delays in frontal maturation have been linked to a range of childhood behavioral and regulatory problems (e.g., Dawson & Fischer, 1994). One way to measure frontal brain maturation is to examine the development of EEG spectral power (Thatcher, 1991). The development of spectral power in faster frequencies (e.g., alpha) is thought to reflect increased brain maturation of the cerebral cortex, and increases in EEG power in these faster frequencies have been related to regulatory functions (Bell & Wolfe, 2007; Clarke et al., 2001). In infants and young children, there is more spectral EEG power at slower frequencies (e.g., delta) relative to faster frequencies in absolute terms and, with age, delta occupies less power, whereas alpha occupies more power in the overall power spectrum (Clarke et al., 2001; Marshall et al., 2002). Accordingly, increases in the ratio of alpha to delta power (i.e., alpha/delta ratio [ADR]) may reflect an increase in the proportion of alpha to delta power and a proxy of brain maturation.

Using this idea as a guiding framework, we have examined the ADR score in relation to shyness during early (Schmidt & Poole, 2018) and late (Schmidt & Poole, 2020b) childhood in three separate studies. In Study 1 (Schmidt & Poole, 2018), six‐year‐old children had resting state EEG collected across four repeated assessments

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separated by approximately six months. We examined how maternal‐reported shyness predicted the trajectory of ADR across the repeated assessments spanning age six to eight years. We found that low shy and high shy children exhibited a similar ADR ratio score at enrollment. However, we found that low shy exhibited the expected linear increases in ADR across visits, whereas high shy children failed to show significant increases in ADR across visits.

We sought to replicate these findings in a separate study using an independent sample of older children (age 10 to 16 years). In Study 2 (Schmidt & Poole, 2020b), we derived latent classes of observed shyness across two visits spanning approximately one year and examined if they were distinguishable on frontal ADR that was col- lected using EEG at enrollment. Consistent with findings in younger children (i.e., Study 1), we found that children who displayed stable‐low levels of observed shyness showed a significantly higher frontal ADR score relative to children who showed stable‐high levels of observed shyness.

In Study 3 (Schmidt & Poole, 2021), we examined the specificity of frontal ADR in relation to the positive and nonpositive shyness subtypes and a low shy group used in the Poole and Schmidt (2019b) study described above. We found preliminary evidence of a linear relation between frontal ADR score and shyness group in children, such that the positive shy group had the lowest ADR score, the low shy group the highest ADR score, and the nonpositive shy group was intermediate between the two former groups, suggesting possible differ- ences in frontal brain maturation for some adaptive aspects of shyness.

In interpreting these findings, we have speculated two possible explanations (Schmidt & Poole, 2018, 2020b). One is a proximate explanation. That is, the pattern of less growth in the proportion of relative alpha power to delta power among shy children might reflect a neural mechanism underlying dysregulation of emotion regu- latory processes in social situations, which is characteristic of some shy children. Previous work has reported that delayed frontal brain maturation may underlie some emotional and behavioral problems that are related to shyness in children (see, e.g., Dawson & Fischer, 1994; Posner & Rothbart, 2000; Schore, 1996; for reviews). A second is an ultimate explanation. That is, delayed frontal brain maturation might reflect individual differ- ences in the evolutionary process of neoteny. *Neoteny* refers to the prolongation retention of childhood charac- teristics and delayed maturity (Bogin, 1990; Gould, 1977, 2008). Unlike most mammals, human development is characterized by a relatively long period of childhood. This protracted period is presumed to have played a criti- cal part of human evolution, allowing our brains to grow larger and allowing for the development of higher order cognitive processes (Bogin, 1990). Neoteny has been hypothesized as an important element to social cognitive development in humans in that one of the presumed functions of extending childhood is to allow additional time for learning to take place when the brain is highly plastic (Bjorklund, 1997, 2009; Gallese, 2017).

Interestingly, there is empirical evidence for neoteny in the human brain (Somel et al., 2009), particularly the prefrontal cortex (Petanjek et al., 2011).

We have speculated that shyness may have evolved due to individual differences in frontal brain maturation, resulting from the process of neoteny (see Schmidt & Poole, 2019, for a review). The function of delayed frontal brain maturation, manifesting as an approach‐avoidance conflict in social situations, may actually allow the shy child additional time for learning of others’ intentions before socially participating. Indeed, as noted earlier, expressions of positive shyness have been associated with more sophisticated Theory of Mind in two separate studies of children (Colonnesi et al., 2017; MacGowan et al., 2021). This additional time for learning others’ intentions is important for negotiating familiar and unfamiliar social environments. Interestingly, per- haps the social immaturity (Rubin & Asendorpf, 1993), and delayed onset of some developmental milestones in shy children (Caspi et al., 1988) reflect the process of neoteny. We speculate that the delaying of brain matu- rity, particularly in the frontal brain regions, may be a neotenous feature present in some shy individuals, which serves as a putative mechanism linking shyness and adaptive behavior.

Although it is difficult to empirically test ultimate and evolutionary explanations of behavior, as reviewed in the series of EEG studies above, we have begun to explore the proximate explanation using EEG measures to index brain maturation and emotion regulatory processes underlying adaptive shyness. We have also recently begun to explore more proximate hypotheses of the adaptive nature of shyness by examining adaptive pro- cesses in the shy brain using perceptual tasks. Here we adapt shy individuals to affective faces varying in emo- tional expressions and examine their corresponding afterimages to that particular emotion. For example, after adapting to a positive facial expression (e.g., happy faces), the typical visual afterimage that follows is to

perceive a negative facial expression (e.g., angry face), while after adapting to a negative facial expression (e.g., angry face), the typical visual afterimage that follows is to perceive a positive facial expression (e.g., happy face). However, there appear to be individual differences in the experience of these afterimages. We found that young adults who had high levels of both shyness and sociability were more likely to perceive a negative face emotion afterimage after adapting to happy faces and a positive face emotion afterimage after adapting to angry faces than young adults classified by other combinations of high and low shyness and sociability (Poole et al., 2020). These findings suggest that the experiences of these afterimages appear to be linked to personality and may be a window into understanding individual differences in how well the brain adapts to social stimuli, with some shy subtypes possibly showing an advantage in adapting to these social stimuli.

Future research could test the proposed shyness‐neoteny hypothesis in several ways (see Schmidt & Poole, 2019). First, if there are indeed maturational delays associated with some types of shyness, then perhaps these delays would be evidenced on epigenetic markers of aging, which could be examined. Second, to the extent that neoteny may have allowed for prolonged learning to take place, then there may be differences in learning and memory among some types of shyness in different social contexts that could be examined. Lastly, the shy- ness‐neoteny hypothesis could be tested between the sexes for preferences across a range of stimuli, for exam- ple, people expressing neotenous features (e.g., coyness, youthful smiles) and characteristics of some types of shyness could be judged for attraction and interpersonal likeability.

### Conclusion

In this chapter, we considered the evolutionary and neuroscientific basis for shyness. More specifically, we discussed the adaptive aspects of different subtypes of shyness, the putative function of these subtypes, some of the regulatory mechanisms of shyness subtypes, and how these mechanisms maybe instantiated in the brain. We put forth a speculate hypothesis that some types of shyness may be adaptive and linked to a delay- ing of brain maturation (i.e., neoteny). This delaying of maturation may have served an important function in our evolutionary past as humans began to evolve, our neocortex grew larger, and social interactions became more complex in that it may have allowed some individuals more time for additional learning to take place about the intentions and motives of conspecifics. To that end, in some sense, the shy brain has remained forever young.

An Attachment Perspective on Solitude and Loneliness

Being together and being alone are two core human experiences that have both rewarding and aversive aspects and can have both positive and negative implications for well‐being and psychosocial functioning (e.g., Coplan et al., 2018; Cupach & Spitzberg, 2010). In the current chapter, we focus on the experience of being alone and propose an attachment‐theoretical (Bowlby, 1973, 1982, 1988) perspective for explaining individual differences in attitudes toward solitude and feelings of loneliness. Specifically, we propose that a sense of attachment secu- rity (a belief that one can trust others and can confidently expect that they will be available and responsive when needed) provides a solid foundation for enjoying periods of solitude and developing a capacity to be comfortably alone. In contrast, attachment insecurities interfere with this capacity and transform solitude into an undesirable experience of loneliness. We begin with a brief summary of adult attachment theory and pro- vide an account of the sense of security and the two major dimensions of attachment insecurity, anxiety, and avoidance. Next, we review findings on the interpersonal manifestations of attachment insecurities. Then we propose an attachment perspective on solitude and loneliness and review empirical research concerning attach- ment‐related differences, during adolescence and adulthood, in the experience of being alone.

##### Attachment Theory and Research

One of the core tenets of attachment theory (Bowlby, 1973, 1980, 1982) is that human beings are born with a psychobiological system (the *attachment behavioral system*) that motivates them to seek proximity to significant others (*attachment figures*) in times of need. According to Bowlby (1982), the goal of this system is to maintain adequate protection and support, which is accompanied by a subjective sense of safety and security. This goal is made salient when people encounter actual or symbolic threats and notice that an attachment figure is not sufficiently near, interested, or responsive (Bowlby, 1982). In such cases, a person’s attachment system is upreg- ulated and the person is motivated to increase or reestablish proximity to an attachment figure so that “felt security” (Sroufe & Waters, 1977) is attained.

Bowlby (1988) assumed that although age and development increase a person’s ability to gain comfort from internal, symbolic representations of attachment figures, no one at any age is completely free from reliance on actual others. The attachment system therefore remains active over the entire life span, as indicated by adults’ tendency to seek proximity and support when threatened or distressed (Zeifman & Hazan, 2016). Moreover, peo- ple of all ages are capable of becoming emotionally attached to a variety of relationship partners (e.g., siblings, friends, romantic partners, coaches, and leaders), using such people as “stronger and wiser” attachment figures

(Bowlby, 1982) – i.e., as safe havens in times of need and secure bases from which to explore and develop skills – and suffering distress upon prolonged or permanent separation from these people (Bowlby, 1980; Fraley & Shaver, 2016). Bowlby (1973) devoted a great deal of attention to individual differences in attachment‐system functioning that arise as a result of the availability, responsiveness, and supportiveness of a person’s key attachment figures, espe- cially in times of need. Interactions with attachment figures who are available, sensitive, and supportive in times of need facilitate: (1) the smooth functioning of the attachment system; (2) promote a sense of connectedness and security; and (3) strengthen positive mental representations (*working models*) of self and others. In contrast, when attachment figures are not reliably available and supportive: (1) a sense of security is not attained; (2) worries about one’s social value and others’ intentions become ingrained; and (3) strategies of affect regulation other than

proximity seeking are developed (*secondary attachment strategies*, characterized by *anxiety* and/or *avoidance*).

When studying individual differences in attachment‐system functioning in adults, attachment research has focused primarily on *attachment orientations* (or *styles*) – patterns of relational expectations, emotions, and behaviors that result from internalizing a particular history of attachment experiences (Fraley & Shaver, 2000). Research, beginning with Ainsworth, Blehar, Waters, and Wall (1978) and continuing through scores of recent studies by social and personality psychologists (for a review see Mikulincer & Shaver, 2016), indicates that attachment styles are conceptually located in a two‐dimensional space defined by two roughly orthogonal dimensions, attachment anxiety and attachment‐related avoidance (Brennan et al., 1998). The avoidance dimen- sion reflects the extent to which a person distrusts relationship partners’ goodwill and defensively strives to maintain behavioral independence and emotional distance. The anxiety dimension reflects the extent to which a person worries that a partner will not be available in times of need, partly because of the person’s self‐doubts about his or her own love‐worthiness. People who score low on both dimensions are said to be secure with respect to attachment. A person’s location in the two‐dimensional space can be measured with reliable and valid self‐report scales (e.g., the *Experiences in Close Relationships* scale, ECR, Brennan et al., 1998), and this loca- tion is associated in theoretically predictable ways with a wide variety of measures of relationship quality and psychological adjustment (Mikulincer & Shaver, 2016).

We (Mikulincer & Shaver, 2003) proposed that a person’s location in the two‐dimensional anxiety‐by‐avoid- ance space reflects both his or her sense of attachment security and the ways in which he or she deals with threats and stressors. People who score low on these dimensions are generally secure, hold positive working models of self and others, and tend to employ constructive and effective affect‐regulation strategies. Those who score high on either attachment anxiety or avoidance, or both (a condition called fearful avoidance), suffer from attachment insecurities, self‐related worries, and distrust of others’ goodwill and responsiveness in times of need. Moreover, these insecure people tend to use secondary attachment strategies that we, following Cassidy and Kobak (1988), conceptualize as attachment‐system “hyperactivating” or “deactivating” to cope with threats, frustrations, rejections, and losses.

People who score high on attachment anxiety rely on hyperactivating strategies – energetic attempts to achieve support and love combined with a lack of confidence that these resources will be provided and with feelings of anger and despair when they are not provided (Cassidy & Kobak, 1988). These reactions occur in relationships in which an attachment figure is sometimes responsive but unreliably so, placing the needy per- son on a partial reinforcement schedule that rewards exaggeration and persistence in proximity‐seeking attempts because these efforts sometimes succeed. In contrast, people who score high on attachment‐related avoidance tend to use deactivating strategies: trying not to seek proximity to others when threatened, denying vulnerability and needs for other people, and avoiding closeness and interdependence in relationships. These strategies develop in relationships with attachment figures who disapprove of and punish frequent expressions of need and bids for closeness (Shaver & Hazan, 1993).

##### Interpersonal Manifestations of Attachment Orientations

People enter social interactions with knowledge and attitudes that they acquired during past interactions with the same relationship partner, or they transfer and apply knowledge and attitudes based on previous relation- ships (Brumbaugh & Fraley, 2006). These cognitive construals include a person’s goal structure (the goals he or

she frequently seeks during social interactions) and knowledge about self and others (beliefs about one’s worth, skills, and efficacy; beliefs about a partner’s likely motives and actions). These construals can bias feelings and behavior during an interpersonal interaction via top‐down, schematic processes that favor attention to and encoding of information that reinforces expectations and encourages the ignoring or dismissal of information that invalidates expectations. More important, these construals are parts or offshoots of a person’s attachment orientation, and they are among the main vehicles by which these orientations would shape relational cogni- tions, feelings, and behaviors and bias relationship satisfaction and stability.

A host of studies have shown that attachment orientations are associated with the goals that people pursue in interpersonal interactions. Specifically, more avoidant people are more likely to prioritize distance‐related goals, whereas more anxious people are more likely to prioritize closeness‐related goals (e.g., Greenwood & Long, 2011; Van Petegem et al., 2013). For example, in a longitudinal study, Van Petegem et al. (2013) found that anxious attachment among adolescents measured at one time point predicted lower levels of autonomy goals within a family context a year later. In another study, Fraley and Marks (2011) found that avoidant people implicitly preferred distancing in a motor task in which participants were instructed to push or pull a lever in response to lexical stimuli. More avoidant participants were faster to push the lever away from themselves when presented with the word “Mom.”

There is also evidence that people differing in attachment orientations also differ in the way they perceive others. Numerous studies have shown that individuals who score higher on attachment anxiety or avoidance have more negative explicit and implicit views of relationship partners, hold more negative expectations con- cerning their relationship partners’ behavior, and tend to explain a partner’s hurtful behavior in more negative terms (e.g., Chavis & Kisley, 2012; Collins et al., 2006). For example, Baldwin et al. (1993) examined the cogni- tive accessibility of expectations regarding a partner’s behavior, using a lexical‐decision task, and found that avoidant people had readier mental access to representations of negative partner behaviors (e.g., the part- ner being hurtful) than did secure people. In addition, Collins et al. (2006) found that less secure people, either more anxious or avoidant, tended to attribute a partner’s hurtful behavior to the partner’s personal- ity and bad intentions and were more likely to believe that this behavior was likely to destroy the relationship.

Hundreds of studies, summarized in the second edition of our book (Mikulincer & Shaver, 2016), have demonstrated that attachment insecurities, expressed as either anxiety or avoidance, also tend to have detrimental effects on the quality and stability of social and personal relationships during adolescence and adulthood. In both cross‐sectional and prospective studies of both dating and married couples, less secure people have reported lower levels of relationship satisfaction and higher rates of relationship instability (see Mikulincer & Shaver, 2016, for a review). Self‐reports of attachment insecurities have also been associated with friendships characterized by relatively low levels of trust, closeness, mutuality, and satisfaction (e.g., Bippus & Rollin, 2003; Chow et al., 2016; Granot & Mayseless, 2012). Moreover, attach- ment insecurities reduce the quality and success of flirtation and dating interactions (e.g., McClure & Lydon, 2014; McClure et al., 2010), undermine the quality of interpersonal communication (e.g., Beck et al., 2014; Wegner et al., 2018), and increase the amount and severity of interpersonal conflicts and the reliance on less adaptive ways of managing these conflicts (e.g., Brassard et al., 2009; Creasey, 2014; Overall et al., 2013).

The conclusion that attachment insecurities put people at risk for troubled, unstable relationships is further supported by studies assessing people’s profiles of interpersonal problems (e.g., Bailey et al., 2018; Bartholomew & Horowitz, 1991; and see Hayden et al., 2017, for a meta‐analysis). Attachment anxiety is consistently associ- ated with a higher overall level of interpersonal problems and with notable elevations in problems related to being *submissive, exploitable,* and *overly intrusive/demanding*. Avoidant attachment is usually associated with problems related to being *overly competitive*, *cold,* and *socially withdrawn*. In the next section, we turn to experi- ences of being alone and show that the negative representations of others, interpersonal problems, and low‐ quality relationships of insecure people not only make being together difficult and often painful but also bias people’s attitudes toward solitude, interfere with the capacity to be alone, and promote feelings of loneliness.

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##### Attachment Orientations, Solitude, and the Capacity to Be Alone

Being alone is a common human experience during which people can curiously explore, play, learn, and reflect about themselves and the world (e.g., Ainsworth, 1991) and create novel ideas and artworks derived from their own experience (Csikszentmihalyi, 1996). They can also meditate and be more mindful of their current feelings and sensations (Kabat‐Zinn, 1994) and calm themselves and renew feelings of mental energy (Korpela & Staats, Chapter 23). Several writers (e.g., Buchholz, 1997; Larson, 1990; Long & Averill, 2003; Modell, 1993; Winnicott, 1958) have argued that people have an innate need for solitude and that moments or periods of *voluntary* solitude provide an opportunity to feel free and relaxed and to engage in creative imagination and productive self‐transformation. According to Winnicott (1958), during these moments people can enjoy being with themselves in a relaxed manner without having to react to social demands or others’ influence. This relaxed state allows one to be authentic, spontaneous, creative, autonomous, and in contact with one’s *true self* (Winnicott, 1963).

However, there are individual differences in the extent to which people experience solitude as a positive state and enjoy the psychological benefits of being alone (e.g., Buchholz & Catton, 1999; Coplan et al., 2018). Research has shown that children, adolescents, and adults differ in their need to be alone (e.g., Coplan et al., 2015) and the extent to which they take pleasure in solitude (e.g., Burger, 1995; Marcoen et al., 1987) and toler- ate moments of aloneness (e.g., Bowker & Raja, 2011). Recently, Coplan et al. (2019) introduced the construct of aloneliness to reflect feelings of dissatisfaction that may arise when the need for solitude is not met (i.e., when one wants to spend more time alone than the time one typically spends). Like loneliness, which reflects feelings of dissatisfaction when the need for relatedness is not met, aloneliness was also found to be associated with negative affectivity and depression (Coplan et al., 2019).

According to Winnicott (1958), the capacity to enjoy moments of solitude develops from the calm experi- ence of being alone during infancy in the presence of the attachment figure (usually mother). The presence of what Winnicott (1958, 1963) called a *good enough mother*, who is reliable, responsive, and sensitive to the infant’s needs, provides a temporal and spatial place for infants to exist in a state of “*going‐on‐being.”* In this state, since infants are not driven by urgent biological needs and can feel secure in the presence of mother; they can enjoy being in a restful state of mind and experience personal impulses, sensations, or feelings in a mindful and clear manner (Winnicott, 1958). If the mother reacts in an intrusive manner and does not allow her infant to reside in this resting state of aloneness, the infant cannot fully experience and recognize its impulses, sensations, and feelings as part of a comfortably developing self. Similarly, if the mother is not available or responsive when needed, the personal impulses, sensations, and feelings of restful solitude might be overwhelming for the immature infant or pushed aside by concerns about the need for parental attention. In fact, only when mothers (and other parental figures) interact with infants in a loving and nonintrusive manner, can the infants vividly and comfortably notice, enjoy, and explore their inner experiences (Tuber, 2008). Gradually, infants internalize the representation of a loving and supportive parent and become able to enjoy moments of solitude (Winnicott, 1958, 1963).

Following Winnicott’s (1958, 1963) reasoning, we suggest that the capacity to be comfortably and reward- ingly alone allows a person to enjoy both a sense of enjoyable self hood and the feeling of being closely related to loving others. In Winnicott’s (1958) terms, a person who develops the capacity to be alone is never truly alone. Rather, an internalized presence of a loving relationship partner is always available in his or her mind. Therefore, when a healthy capacity to be alone develops normally, moments of solitude activate feelings of personal value and strength by reactivating mental representations of loving and caring others. Winnicott (1958) claimed that a mature adult can use moments of solitude to regulate anxiety and restore emotional equanimity during stressful periods while relying on internalized representations of loving attachment figures. It is therefore important to distinguish between (1) being socially withdrawn and detached from others in a frightening, depressing, or deadening way and (2) having a well‐developed capacity to be comfortably alone while maintaining a close, interdependent relationship with a loving partner. It is also worthwhile to distinguish between the capacity to be alone (i.e., feeling comfortable during periods of solitude) and an affinity or prefer- ence for solitude (i.e., being intrinsically motived to actively seek out time alone).

The development of an inner sense of security (Sroufe & Waters’s, 1977, “felt security”) during interactions with a loving and responsive attachment figure is thus an important contributor to developing the capacity to be alone and enjoy solitude. As reviewed above, adults who enjoy a strong sense of attachment security tend to maintain positive representations of relationship partners and to rely on these representations both for mitigat- ing distress and for engaging fully in relaxed and joyful exploration, play, and learning (Mikulincer & Shaver, 2016). These positive representations also allow them to enjoy solitude without being afraid of a part- ner’s disapproval, rejection, or intrusions. In contrast, attachment insecurities may interfere with the ability to enjoy and benefit from solitude and may foster what Goosens and colleagues called aversion to aloneness (e.g., Danneel et al., 2018; Marcoen et al., 1987).

Difficulty in enjoying solitude might be especially pronounced in people who score high in attachment anxi- ety, because they have an unmet desire to be very close to their relationship partner and are prone to worry or even panic when this closeness seems unavailable at a particular time. They also tend to worry that their partner might abandon them if they pay too much attention to their own wishes and needs or engage in independent activities (Hazan & Shaver, 1987; Shaver & Mikulincer, 2002). Moreover, attachment‐anxious individuals might be less accepting of their partner’s moments or periods of solitude, interpreting them as signs of inattention, rejection, or unavailability, increasing the impulse to intrude into a partner’s personal space (Lavy et al., 2013). For attachment‐avoidant people, solitude might serve as an at‐first desirable means to deactivate attachment needs and feelings, which is their main defensive maneuver (Hazan & Shaver, 1987; Shaver & Mikulincer, 2002). But this can lead to feelings of boredom and meaninglessness, which is the way avoidant people habitually feel during moments of aloneness (Tidwell et al., 1996). It might also become an excuse for sustaining psychological distance from a partner, gradually causing the relationship to fail.

Unfortunately, there has been no systematic, published research program examining links between attach- ment orientations and solitude. However, a recently unpublished master’s thesis conducted by the third author (Gal, 2019) provides initial evidence on these links. Gal (2019) conducted three correlational studies of married Israeli young adults in which they completed the Experiences in Close Relationships (ECR) scale (Brennan et al., 1998), tapping attachment anxiety and avoidance. They also completed scales assessing preference for soli- tude (e.g., Burger, 1995) and perceived benefits and threats of being alone (e.g., Segal, 1997). In addition, they completed two new brief scales assessing a participant’s capacity to be alone (eight items) and difficulties with a partner’s aloneness (six items) when the two are together at home. When completing these scales, participants were instructed to focus on times when they were at home with their partner and to rate the extent to which they were capable of being alone at these times (e.g., “I find it hard to study or to work alone when my partner is at home,” “I find easy to be alone with myself and to feel peaceful and calm when my partner is at home”) and to accept the partner’s aloneness (e.g., “I find it hard when my partner decides to work or study alone when I’m at home,” “I don’t like it when my partner decides to be alone with himself/herself when I’m at home”).

In addition, Gal (2019) conducted a fourth study examining the contribution of attachment orientations to participants’ cognitive and affective responses while being alone in the presence of their romantic partner dur- ing a structured laboratory session. Both partners of heterosexual couples living together independently com- pleted the ECR scale and were invited to participate in a laboratory session in which they were asked to freely interact with each other for 10 minutes while simulating being together at home. One of the partners was randomly selected to be the “actor” and, after interacting for three minutes, he or she was privately instructed to be alone in the presence of the other partner without informing him or her about the instructions. After three minutes, the “actor” was instructed to stop what he or she was doing and return to interacting with his or her partner for another two minutes. Then, both partners completed scales describing their own experience during the aloneness period (when the “actor” was instructed to be alone) and during the reunion period (when the actor returned to interact with his or her partner).

Across the four studies there was support for the hypothesized links between attachment anxiety, aversion of solitude, and difficulties in being alone within a close relationship. Specifically, attachment anxiety was sig- nificantly associated with the appraisal of more aloneness‐related threats, the report of less capacity to be alone when the partner is at home, and the expression of more difficulties accepting the partner’s periods of solitude. In the experimental session, attachment anxiety was significantly associated with both actors’ and partners’

reports of less ability to be comfortably alone during the aloneness episode and with less positive perceptions of the partner and more negative feelings during both the aloneness and reunion episodes.

The findings also supported the hypothesis that attachment‐avoidant people would prefer to be literally alone and would have difficulty maintaining a balance between solitude and togetherness within a close rela- tionship. Specifically, attachment avoidance was associated with a greater affinity for solitude, but it was also associated with lower ability to be comfortably alone when the partner is at home. In the experimental session, avoidance was significantly associated with both actors’ and partners’ reports of impaired ability to be comfort- ably alone during the aloneness episode and with less positive perceptions of the partner and less positive feel- ings during both the aloneness and reunion episodes. Importantly, the observed links between attachment and experiences of solitude could not explained by alternative and related relational and personality constructs, such as relationship satisfaction, trust, intrusiveness, and dependence or self‐direction and autonomy. Rather, the results were found to be a result of attachment dynamics affecting the experience of solitude.

##### Attachment Orientations and Feelings of Loneliness

The negative mental representations, interpersonal problems, and unstable relationships associated with attachment insecurities not only create problems with being alone and enjoying moments of solitude; they also seem to foster feelings of relationship dissatisfaction and loneliness. The term loneliness refers to a negative psychological experience caused by actual or perceived deficiencies in one’s relationships and from feelings of deprivation in relation to others (Peplau & Perlman, 1982). Larose et al. (2002), for example, defined loneliness as a “subjective distressing and unpleasant state in which individuals perceive deficiencies in their social world” (p. 684). These deficiencies are not only quantitative, such as having few friends or engaging in too few social activities, but are also indicative of poor‐quality relationships in which people feel a lack of intimacy and emo- tional closeness, and perceive themselves as unloved, unaccepted, insufficiently cared for, misunderstood, or invalidated by a relationship partner (e.g., Ernst & Cacioppo, 1999). The chronic, dispositional form of loneli- ness is thought to result from a history of relationships with cool, rejecting, inconsistent, or unavailable attach- ment figures (e.g., Rubenstein & Shaver, 1982; Weiss, 1973).

Working explicitly from an attachment perspective, Weiss (1973) defined loneliness as an emotion that sig- nals unsatisfied needs for proximity, love, and care due to the unavailability and nonresponsiveness of attach- ment figures. In other words, loneliness is a form of separation distress that results from failure to meet basic attachment needs. As such, loneliness should be mitigated or precluded by partners and relationships that promote a sense of security and satisfy one’s needs for love, acceptance, understanding, and care. In contrast, a history of relationships with unavailable and nonresponsive relationship partners and the resulting attach- ment insecurities should render a person chronically vulnerable to loneliness (Berlin et al., 1995; Hazan & Shaver, 1987).

Attachment researchers have also hypothesized that anxious attachment is more conducive to loneliness than is avoidant attachment (e.g., Berlin et al., 1995; Hazan & Shaver, 1987). Attachment‐anxious people exag- gerate their unsatisfied needs for care and security, which intensifies the psychological pain associated with insufficient or absent love and partner responsiveness. Avoidant people try to deny or inhibit attachment needs and may therefore feel less directly or less consciously frustrated by poor‐quality relationships or nonresponsive partners. As already shown in this chapter, avoidant individuals tend to be disengaged in social interactions, which leads them to feel bored, distant, tense, or irritated (Tidwell et al., 1996), but they can acknowledge those feelings without admitting a need for affection or connectedness. In fact, construing the problem as one of boredom or irritation puts the blame on something outside the avoidant person. One can be bored and critical or dismissing of others without admitting personal needs, insufficiencies, or dependence on others. According to Hazan and Shaver (1987), this stance often allows avoidant people to admit that they are distant from others without missing others or labeling themselves lonely.

These hypotheses have been supported by dozens of studies examining associations between self‐reports of attachment orientation and feelings of loneliness (see Mikulincer & Shaver, 2016, for a complete review of these studies). For example, all studies in which attachment security in relationships with parents during

adolescence was correlated with loneliness have produced inverse associations (e.g., Al‐Yagon et al., 2016; Aikins et al., 2009). In addition, more than 95% of the studies that included measures of attachment anxiety or compared anxious with secure people have found that anxious attachment is strongly associated with greater loneliness when examined cross‐sectionally or longitudinally (e.g., Bachem et al., 2019; Pereira et al., 2014). For example, Bartz et al. (2016) found that attachment anxiety was associated with greater loneliness and a higher tendency to attribute humanlike traits (e.g., free will) to nonhuman agents (anthropomorphism), presumably in an attempt to fulfill unmet needs for connection. Moreover, attachment anxiety mediated the link between loneliness and the cognitive bias of anthropomorphism.

Interestingly, most of the studies that have assessed avoidance or compared avoidant with secure individuals have found that avoidant attachment, like attachment anxiety, is associated with greater loneliness (e.g., Heatley Tejada et al., 2017; Itzhaky et al., 2017). This finding might imply that avoidant people may not deactivate their attachment systems to the point of not caring at all about the absence of supportive relationships and may not be able to deny loneliness by interpreting it as boredom. This conclusion is consistent with findings from experimental studies showing that the contextual priming of security‐enhancing representations (e.g., name of a security provider) produced positive cognitive and emotional effects even among people scoring relatively high on avoidant attachment (e.g., Cassidy et al., 2018; Mikulincer et al., 2014). Thus, it seems that avoidant people have a need for security lurking beneath their characteristic avoidant defenses (Shaver & Mikulincer, 2002).

However, even if both anxious and avoidant people tend to feel lonely, only avoidant people seem to choose to withdraw socially and remain isolated. For example, Shaver and Hazan (1987) reported that whereas attach- ment‐anxious people described themselves as more hopeful and active in their search for relationship part- ners, avoidant people were more likely to believe they would always be lonely. In fact, avoidant people are more likely to say that during the preceding few years they have not felt in tune with other people, have not been part of a group of friends, and have not felt close to anyone (Shaver & Hazan, 1987). Similarly, studies have found that avoidance is associated with social withdrawal (e.g., Chen et al., 2012; Shallcross et al., 2014) and perception of fewer opportunities for romantic connection especially when there is a potential for con- nection (Spielmann et al., 2013). In addition, there is evidence that avoidance increases the odds of being sin- gle or not being involved in serious dating (e.g., Adamczyk & Bookwala, 2013; Ringstad & Pepping, 2016). However, at odds with these findings, Schachner et al. (2008) found no sign of heighted avoidant attachment in a community sample of long‐term single adults (not being in a committed relationship for the past three or more years and not likely to become committed in the near future) compared to coupled participants. Moreover, Pepping et al. (2018) offered a theoretical model by which long‐term singlehood can result from avoidant deactivation or anxious hyperactivation of the attachment system or from an authentic personal decision sustained by one’s sense of security. That is, being single does not imply being insecure (see also Adamczyk, Chapter 12).

Avoidant people’s social withdrawal is also manifested in recent studies that have assessed feelings of nostal- gia (the emotional mechanism that activates a need for social connectedness and memories of emotional close- ness; Wildschut et al., 2006). According to Wildschut et al. (2006), nostalgia is activated by loneliness, and the experience of nostalgia tends to reduce loneliness and increase perceptions of emotional connection to others. In three studies, Wildschut et al. (2010) found that feelings of nostalgia are inhibited by attachment‐related avoidance, which is compatible with the idea that avoidant people prefer social withdrawal over emotional con- nectedness. In addition, an experimental induction of relational isolation increased reports of nostalgia among low‐avoidant participants, but not among high‐avoidant participants.

In two additional studies, Wildschut et al. (2010) found that more avoidant people benefited less from nos- talgia: An experimental induction of nostalgia in the laboratory (as compared with a control condition) increased perceptions of social connectedness and interpersonal competence, but only among low‐avoidant participants. Moreover, several studies have found that an experimental induction of nostalgia increased approach‐oriented social intentions/goals to connect with others or to pursue a romantic relationship when avoidant attachment was low but not when it was high (e.g., Abeyta et al., 2019; Juhl et al., 2012). Abeyta et al. (2015) content analyzed nostalgic narratives and found that the narratives of more avoidant people included less attachment‐related content.

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##### Concluding Remarks

The experience of being alone, like the experience of being together, is an enticing topic for personality‐social psychologists interested in attachment. In this chapter, we have proposed and briefly explored an attachment perspective on solitude that follows Rubenstein and Shaver’s (1982) early distinction between loneliness and positive solitude, with the former being more common in people with an insecure attachment orientation, and the latter being a healthy state sustained by a sense of security. However, most of the research on attachment and solitude has focused largely on insecure people’s heightened feelings of loneliness and have overlooked the possibility that secure individuals might be most comfortable with solitude, and might be able to pursue it and benefit from it in healthy, creative ways. That possibility has recently been studied by Gal (2019), as summa- rized here, but we need more systematic research on this topic and on the ways in which a sense of security provides a basis for developing a capacity to be alone and savor moments of solitude while maintaining a healthy balance between aloneness and togetherness.

### What Does Animal (Nonhuman) Research Tell Us About Social Deprivation and Social Isolation?

Humans are often described as “social animals” (Batson, 1990). Most animals, however, are social in that they interact with other conspecifics on a regular basis. For example, nonhuman mammals, such as primates and rodents, are both typically reared by their primary caregiver/s in the early stages of their development and con- tinue to interact socially with other conspecifics across their lifetime. Therefore, primate and rodent models offer important opportunities for examining how, why, and when social interactions or their absence matter for healthy development (Brett et al., 2015; Gunnar & Quevedo, 2007). One experimental approach used for answer- ing these questions is depriving animals of specific types of social experiences, such as interactions with mothers or peers, and examining the effects of the social deprivation on development. This work is suitable for answering questions such as: (1) How does maternal, paternal, and/or peer deprivation during specific developmental peri- ods affect development?; (2) Does the developmental timing and duration of social deprivation affect develop- mental outcomes?; and (3) Can the effects of social deprivation or isolation be reversed by later social interactions or enrichment? Another approach examines whether ordinary variations in animal temperament, particularly fearful responses to unfamiliar social partners, are associated with social isolation and health problems.

In this chapter, we first discuss why it is important to understand the effects of social deprivation and social isolation on humans. Second, we provide a brief review of the theoretical and empirical work on the importance of social relationships in development. Third, we describe the utility of animal models for understanding the potential impact of certain types of social deprivation and isolation experienced by some humans focusing on two main animal models: nonhuman primates and rodents. For each model, we describe the similarities of findings with these species with humans and discuss the unique strengths of research conducted with that population. We then review the nonhuman primate and rodent empirical work on (1) how social deprivation and social isolation as “induced” by experimental manipulations affect development, and (2) how “naturally occurring” variations in temperament, particularly behavioral inhibition, may serve as a risk factor that leads to social isolation and health problems. In conclusion, we discuss the implications of this work for future research directions with humans.

### The Importance of Understanding the Effects of Social Deprivation and Social isolation

Understanding the impact of social deprivation and social isolation on healthy human functioning is critical for several reasons. Although most humans are raised by their primary caregivers such as mothers and/or fathers, and continue to form social bonds in later years, there are also wide variations in individuals’ social experiences.

For example, around 2.7 million children are estimated to live in institutional care worldwide (Petrowski et al., 2017) and an important proportion of these children are deprived of stable, warm, and responsive car- egiving provided by an attachment figure (Nelson et al., 2019). Given that children with a history of institution- alization have vastly varying experiences before, during, and, for some, after institutionalization, assessing the exact quality and quantity of children’s social experiences or the type of deprivation experienced is often chal- lenging. Thus, animal studies are well suited for examining the impact of social deprivation given that they allow for manipulating the exact timing and duration of the deprivation. By allowing for greater “environmen- tal control,” animal models can help manipulate the specific aspects of deprivation, such as deprivation of milk, tactile stimulation or presence/absence of the caregiver, to identify the mechanisms by which social depriva- tion leads to disruptions in development (Hofer, 1987). Finally, animal models can test whether specific enrich- ment experiences can reverse specific impacts of social deprivation.

Another important variation in children’s early social experiences concerns the family structure they grow up in. Some children are raised in biparental family units with opportunities to interact with two caregivers on a regular basis, whereas others are raised by single or widowed caregivers without opportunities to interact with a second caregiver. Animal research conducted with monogamous, biparental species allow researchers to examine whether growing up in single‐parent family units and/or experiencing “paternal deprivation” have differential effects on the development of the offspring. Additionally, many individuals experience social isolation during certain periods in their lives. Homeschooled children who also grow up without siblings or peers may be deprived of critical social experiences. Individuals who move to another location, change their schools or workplaces, or lose their loved ones can also experience social isolation. Thus, animal research on the effects of social isolation experienced later in life can inform human studies on whether such social isola- tion experiences lead to alterations in biology and behavior. Finally, understanding whether and how ordinary variations in these temperaments in animals may be associated with experiences of social isolation and health problems is critical.

### Brief History of Theory and Research on the Role of Social Relationships for Development

The importance of the early affective relationships among caregivers and their infants has a long history of emphasis in both human and animal work. For instance, in the 1930s and 1940s, psychoanalytic scholars such as Sigmund Freud and René Spitz highlighted the importance of the early mother infant relationship for healthy development and alerted the public on the negative consequences of separating children from their caregivers and families (Hofer, 1994). In his reports published between 1939 and 1945, Freud brought attention to the devastating effects of family disruptions during World War II on children’s development (Freud & Burlingham, 1974). Spitz’s (1945) work has shown that children of incarcerated women who were allowed to have affective interactions with their mothers showed better developmental outcomes than institutionalized children who were deprived of nurturing social interactions. In animal research, Konrad Lorenz (1935) – regarded as the founder of ethology – demonstrated that ducklings *imprint* on the first moving object they see shortly after hatching, which was conceptualized as an early forming “emotional bond” between the mother and her offspring (see Lorenz, 1958).

In the 1940s and 1950s, Harry Harlow’s early work on the negative effects of peer‐rearing in rhesus monkeys’ behaviors also highlighted the importance of early interactions between mothers and their offspring. Harlow is most famously known for his studies examining the maternally deprived infant rhesus monkeys’ preference for the surrogate mothers made from cloth over the ones made from wire. His important conclusion from this line of work was that infants’ attachment to their caregivers is not simply due to the fact that caregivers provide food but rather they often are a source for warmth and comfort through the provision of bodily contact (Harlow & Suomi, 1971). Along with the “surrogate mother” studies, Harlow conducted a series of revolution- ary studies on the impact of social deprivation and isolation that largely contributed to the development of Bowlby’s attachment theory (Van Der Horst et al., 2008).

John Bowlby, who is considered the founder of attachment theory, integrated the early psychoanalytic per- spectives and ethological work on the role of early caregiver–infant relationships into his theory on attachment (Hofer, 1994). Bowlby (1969, 1973, 1982) conceptualized attachment – the special affective bond between a caregiver and his/her child – as an evolutionary‐based motivational system that allows the infant to maintain and restore proximity to the mother to increase his/her chances of survival. Bowlby noted that, when sepa- rated from their mothers, infants first “protest” to this separation by crying, searching, and showing distress signs. The evolutionary function of this behavior is to help the caregiver and offspring find each other. Bowlby suggested that, when the separation lasts longer, infants respond with “despair” showing signs of sadness and withdrawn behaviors that serve to conserve energy and avoid danger in the long absence of the attachment figure. Bowlby indicated that an important feature of the attachment relationship is that it is selective, such that the parent and the infant demonstrate attachment behaviors toward one another but not toward others. Both primates and rodents have been shown to respond to short‐term and long‐term separations from their caregiv- ers in similar ways described by Bowlby (for a review on attachment in rhesus monkeys, see Suomi, 2008; for a review on rodent attachment, see Landers & Sullivan, 2012). These seminal studies provided an important foundation for studying the importance of social interaction. Indeed, Bowlby’s attachment theory, which was built off this foundation of research, is still deemed to be an important conceptual framework for understand- ing the role of early social relationships and their absence in both animal and human research.

### Nonhuman Primate Models

##### Why are Nonhuman Primate Models Useful?

Nonhuman primates are the evolutionarily closest animals to humans (Kumar & Hedges, 1998) and, therefore, provide important models to understand the potential effects of deprivations in social experiences on humans. Rhesus monkeys, perhaps the most commonly used nonhuman primates in research, share similarities with humans (Phillips et al., 2014). They share approximately 95% of their genes with humans, and the structure and functional organization of their brains are highly similar to human brains (Stevens et al., 2009). For example, rhesus monkeys’ neocortex constitutes 72% of the brain volume, whereas humans’ neocortex constitutes 80% of the brain volume (Passingham, 2009). In vast contrast, rats’ neocortex comprises only 28% of the rat brain. Consistent with the similarities in neural architecture, primates are also capable of more advanced cognitive skills such as inhibitory control and delay of gratification, and therefore, are good models for examining the effects of early expe- riences on the development of higher‐level cognition (see Phillips et al., 2014). Similar to humans, nonhuman pri- mates have extended life spans with distinct developmental periods such as infancy, childhood, and adolescence. They spend their early months in close proximity with their caregivers developing an attachment relationship and, then, become gradually more independent from caregivers over time, spending more of their time with peers.

Their social and emotional intelligence also make them good models to understand psychological processes (Phillips et al., 2014). For example, several nonhuman primates including rhesus monkeys and chimpanzees demonstrate complex communication patterns, live in social groups, and demonstrate social learning ability of complex behaviors such washing food before consumption (Stevens et al., 2009). They have the ability to rec- ognize themselves as well as others (see Phillips et al., 2014). Specifically, they are able to discriminate between familiar and unfamiliar faces, recognize individuals’ faces from photos, and understand other conspecifics’ facial expressions (see Phillips et al., 2014).

Nonhuman primates possess relatively stable temperamental and personality dimensions that are compara- ble to the dimensions studied in humans (Capitanio & Widaman, 2005). For example, chimpanzees have rela- tively stable traits such as sociability, positive affect, anxiety, and equitability (see Phillips et al., 2014). Likewise, rhesus monkeys’ temperament during infancy has been associated with both the quality (i.e., reciprocated relationships) and quantity (i.e., how much time they spend with others) of their social relationships during juvenile years (Weinstein & Capitanio, 2008). These similarities allow researchers to examine how early experi- ences such as social deprivation affect their temperament, mood, and personality.

*Harlow’s studies on maternal deprivation and total isolation*. Harry Harlow is one of the most prominent scientists who examined the effects of social deprivation and social isolation on nonhuman primates’ behaviors. Harlow strived to answer whether and how the type, duration, and the timing of social isolation had a lasting impact on rhesus monkeys’ behaviors. In his earlier studies, Harlow used the partial isolation paradigm: monkeys were separated from their mothers shortly after birth and kept alone in a wire‐meshed cage (see Harlow & Harlow, 1962). Although monkeys were kept alone in their cages, they were housed in a larger room where they could see and hear other monkeys but could not have direct physical contact with them. Harlow reported that monkeys that experienced partial isolation showed abnormal behaviors including staring blindly into space, engagement in repetitive and compulsive behaviors, and low levels of attention toward the monkeys kept in neighboring.

In subsequent studies, Harlow examined the effects of total isolation by removing monkeys from mothers shortly after birth and placing them into steel chambers that prevented them from seeing or hearing other monkeys or humans (Harlow et al., 1965). Harlow examined groups of monkeys that were kept in isolation for a duration of three months, six months, and one year, with the goal to understand if the duration of isolation had an effect on monkeys’ behaviors and whether it determined the “reversibility” of the early negative experi- ences. Harlow reported that the duration of social isolation had an additive or cumulative effect on later ability to socialize, such that monkeys isolated for three months showed noticeable disturbances in their social behav- iors. However, those isolated for 6 months and 12 months showed increasingly worse social behaviors (Harlow et al., 1965). Harlow and his students also found that rhesus monkeys reared in total isolation for six months developed normal behavioral repertoire if they had opportunities to spend time with more socially skillful peers (Suomi & Harlow, 1972). These latter findings suggested that the maternally deprived monkeys’ behav- ioral problems were at least partially reversible if they had opportunities to interact with more socially compe- tent peers.

*Effects of peer‐rearing in nonhuman primates*. The effects of maternal deprivation on the development of primates is more commonly examined via peer‐rearing paradigms. In this paradigm, monkeys are deprived of having contact with adult monkeys for the first six months of life (Stevens et al., 2009). Instead, in the first month of their lives, monkeys are reared by animal caretakers in a nursery and subsequently housed with three to five peers. This paradigm is considered to reflect the experiences of children living in institutional care more closely than the “partial” or “total isolation” paradigms of Harlow, given that children growing up in institutions are typically deprived of a sensitive adult caregiver with whom they can develop a secure attachment, but they have opportunities to interact with peers.

Research has shown that although peer‐reared primates show attachment to their peers, their attachment is anxious (Stevens et al., 2009). This may be because peers may not be as effective as parents in regulating young monkeys’ fear and distress in the context of unfamiliar or distressing events. Consistent with this finding, peer‐ rearing has been shown to have negative impact on primates’ ability to use a social companion to reduce stress as reflected by activation of the HPAA axis, a phenomenon referred to as “social buffering.” Specifically, in three‐year‐old rhesus monkeys, social partners were shown to buffer the stress response of the mother‐reared monkeys; however, the same level of buffering was not observed in the peer‐reared monkeys, suggesting that being deprived of early mother–infant relationship harms primates’ ability to benefit from social buffering (Winslow et al., 2003; for a review, see Hostinar et al., 2014).

Although peer‐reared monkeys showed normal physical and motor development, they developed into more anxious, impulsive, and aggressive individuals and often become more submissive, establishing themselves low in social hierarchy (Suomi, 2008). Their social play was observed to be less frequent and complex. They also showed increased preference for alcohol over nonalcoholic solutions (see Barr et al., 2004). Peer‐reared male monkeys have been shown to have increased levels of health problems in terms of frequency and prevalence compared to those reared by their mothers (Conti et al., 2012).

Peer‐rearing has been shown to lead to greater stress reactivity and disruptions in the hypothalamic‐ pituitary adrenal (HPAA) functioning (for a review, Stevens et al., 2009). Specifically, peer‐reared monkeys show higher plasma cortisol (Shannon et al., 1998) and higher basal cortical levels, even after one and a

half, and three years of normal social life (Feng et al., 2011). They experience altered neurotransmitter functioning such as lower levels of serotonin‐binding potential (Ichise et al., 2006) and metabolic altera- tions such as higher rates of whole‐brain glucose metabolism (Doudet et al., 1995).

*The effects of peer deprivation in nonhuman primates.* Although the majority of the social deprivation work with nonhuman primates focused on the effects of maternal deprivation via peer‐rearing studies, it is also important to understand whether peer deprivation alone without the experience of maternal deprivation would lead to any alterations in behavioral development. In the wild, social interactions with peers and other community members constitute an important part of primates’ lives. For example, by six months of age, rhesus monkeys spend only about 20% of their awake time with their mothers but spend the rest of the time with peers and other community members (Stevens et al., 2009).

Based on the proposition that growing up with only a mother without having opportunities to interact with other peers may be harmful for the developmental of social skills, Kempes and her colleagues (2008) compared two groups of rhesus monkeys. The first group was reared only by their mothers and were deprived of peer interactions for the first year of their life and subsequently placed in a peer group with monkeys that were raised in a naturalistic group. The second group was monkeys that were raised in a naturalistic setting with their mothers and peers. Peer‐deprived monkeys showed higher rates of submissive behavior, stereotypic behaviors and agonistic behaviors, and lower rates of grooming and sitting together with other monkeys (Kempes et al., 2008). These findings suggest that being raised only with a mother without having opportuni- ties to interact with peers impacts the development of primates negatively.

##### Studying Temperament in Nonhuman Primates

Although most studies have examined the role of social isolation via “experimental manipulations” that deprived primates from certain social experiences, “naturally occurring” variations in primates’ temperament may also contribute to their experiences of social isolation and loneliness, which in turn may be associated with behavioral and health problems (Capitanio, 2017). One temperament that has been associated with experiences of social isolation in human work is behavioral inhibition. Behavioral inhibition refers to heightened negative reactivity in the presence of unfamiliar individuals and in unfamiliar situations (Fox et al., 2005). Although research on behavioral inhibition has originated from work with human infants (Kagan, 1989), there is evi- dence suggesting that it is not a uniquely human temperament (Capitanio, 2018).

In nonhuman primates, behavioral inhibition is typically assessed via the social separation paradigm (Capitanio, 2017) or the human intruder paradigm (Kalin, 2017). In the social separation paradigm, monkeys are separated from their mothers or their social group, and their distress and vocalizations in response to these separations are observed. Monkeys who show more heightened distress are considered “high reactive,” whereas those who show less distress are considered “less reactive.” More heightened reactivity to social separation in general has been linked with anxiety (Suomi et al., 2011). In the human intruder paradigm, the monkeys first experience a brief social separation from their social group. Following this separation, a human intruder enters the room and looks at the wall, without making any direct eye contract with the monkey. After this phase, the intruder turns back at the monkey and makes direct eye contract (see Suomi et al., 2011).

Using an adapted version of the human intruder paradigm with three‐ to four‐month‐old rhesus monkeys, Chun and Capitanio (2016) identified behaviorally inhibited monkeys based on three criteria: low emotionality in the first hour following relocation, high vigilance at the end of the 25‐hour separation, and a blunted cortisol response seven hours after relocation/separation. Compared to noninhibited Rhesus, behaviorally inhibited Rhesus were found to spend less time in *proximity* with their mothers and experience less grooming, even though there were no differences in time of contact with their mothers. Behaviorally inhibited Rhesus infants were also found to spend more time engaging in nonsocial behaviors, such as being alone, as juveniles but not as adults, suggesting that behavioral inhibition in infancy is at least relatively stable from infancy to

adolescence. Likewise, duration of nonsocial behaviors was also stable from juvenile years to adulthood (Chun & Capitanio, 2016). These findings suggest that natural variations in behavioral inhibition may con- tribute to the extent to which Rhesus spend their time nonsocially or perhaps in isolation from other mem- bers of their social group.

Kalin and his colleagues conducted a series of studies with Rhesus to examine the neural underpinnings of behavioral inhibition, which they refer to as anxious temperament. They have shown that the central nucleus of the amygdala, anterior hippocampus, and orbitofrontal cortex are key components of a larger complex neu- ral network that underlies anxious temperament (Fox et al., 2008; Fox & Kalin, 2014). For example, Rhesus with higher levels of temperamental anxiety were shown to display more elevated metabolic activity in the central nucleus of the amygdala and anterior hippocampus in stressful and non‐stressful contexts (Fox et al., 2008). Targeted lesions in these brain regions were shown to lead to reductions in temperamental anxiety, suggesting that these brain regions likely play a “causal role” in the expression of anxious temperament (Fox & Kalin, 2014). Given that such targeted lesion studies can only be conducted in animal work, these findings have important implications for our understanding of the causal role of specific brain regions in the expression of socially anx- ious behaviors.

Based on these findings, a key question is *how* do these brain regions play a causal role in the expression of anxious temperament? One possibility is that the central nucleus of the amygdala may play a role in the experience of fear and inhibition, whereas the anterior hippocampus and orbitofrontal cortex may regulate the expression of anxiety by providing contextual and regulatory information to the amygdala (Fox & Kalin, 2014). In support of this idea, it was found that the lesions in orbitofrontal cortex led to reduced anxi- ety (freezing behavior) through an effect on the extended amygdala (Fox et al., 2010). This may be because when orbitofrontal cortex does not send certain contextual messages to the amygdala, the amygdala does not respond to distress to the same extent. These findings suggest that these three brain regions embedded within a larger neural network may influence the expression of anxious temperament not only directly but through their connections with each other. An important implication of these findings for interventions is that treatments that target multiple brain regions associated with anxious temperament might be more effective in treating anxious temperament and preventing social isolation that may occur as a result of socially anxious behavior.

In adult Rhesus, another trait that has been linked with their social experiences is sociability or the tendency to affiliate (Capitanio et al., 2014). In nonhuman primates, high sociability is operationalized by high ratings on warmth and affiliation, and low ratings on solidarity. When studying Rhesus with low sociability, Capitanio and his colleagues (2014) hypothesized that there could be two types of low sociable Rhesus: those that were intro- verted and those that are lonely. Introverted animals were characterized as those that showed low social attain- ment and low social initiations, suggesting that they did not attempt to form social connections. On the other hand, lonely animals were those that showed low social attainment but demonstrated high social initiation as the sociable animals. Although the lonely animals showed more social initiations than the introverted animals, they were similar in the extent to which they engaged in complex social behaviors such as “contact” and “initia- tion of grooming.” In line with the findings with humans (Cacioppo & Hawkley, 2009), the lonely animals were more “sensitive to social threat” such that they showed greater social interest in the “safe” juvenile targets compared to the “risky” targets, whereas the high‐sociable and introverted monkeys did not demonstrate such a preference (see Capitanio, 2017). In another study, it was shown that Rhesus that showed greater perceived social isolation reflected by low sociability and high social threat sensitivity demonstrated a sympathetic nerv- ous system gene expression associated with increased inflammation and reduced antiviral responses (Cole et al., 2015). These findings suggest that lonely Rhesus that frequently initiated interactions but could not suc- ceed in social attainment were more sensitive to social threat and showed poorer health outcomes. In sum, individual differences in Rhesus’ temperamental characteristics such as behavioral inhibition and sociability emerge early in development and are relatively stable across time, and these temperamental characteristics may play a role in the extent to which Rhesus can initiate and engage in successful social interactions and/or spend their time in in isolation from others.

### Rodent Models

##### Why Are Rodent Models Useful?

Although rodents are phylogenetically not as close to humans as primates are, they show many similarities to humans in terms of genetic background, anatomy, physiology, and social life. Given rodents’ shorter life cycle, they allow for examining the effects of early experiences within a couple of weeks, rather than decades. Similar to humans and primates, rodents spend the majority of their postnatal period in close care of their parents (Champagne et al., 2003), which provides opportunities to examine whether and how the absence of these early experiences can lead to disruptions in development. After weaning, most rodents spend a large propor- tion of their time with peers or other rodents in the community. Thus, their social nature also allows for exam- ining the effects of deprivation of such critical experiences.

*Effects of maternal separation and maternal deprivation in rodents.* Early studies of Levine (1960) followed by Meaney’s and his colleagues work (1988) have made a substantial impact to the study of maternal separation and deprivation in rodents. Levine designed one of the first postnatal paradigms used with rodents (i.e., handling) to manipulate the mother–infant relationship. In this paradigm, animals are temporarily removed from their mother and their litter and placed into individual cages for up to 15 minutes until their weaning period (Levine, 1960). Research has linked handling with a range of positive developmental outcomes. It leads to increased intensified maternal care involving licking and grooming behaviors as well as greater infant–mother social interactions, which provide the infant with increased sensory stimulation. This enhanced sensory stimulation, in return, has been shown to lead to increases in the secretion of growth hormones, serotonin and thyroid (Meaney et al., 1988). Compared to non‐handled animals, neonatally handled animals display increased exploration (Weinberg et al., 1978), lower levels of emotional reactivity and fearfulness, lower adrenocortical reactivity in response to novel stimuli, and better spatial learning and memory (Meaney et al., 1988). Likewise, handling has been associated with lower anxiety‐ and depression‐like behaviors in male mice (Liu et al., 1997). Overall, this body of work with rodents suggests that infants’ brief separations from the mother in early development are mostly associated with positive emotional and cognitive outcomes rather than negative outcomes. Brief separations are therefore often considered as “brief immunizations” that allow infants to deal with challenges in a less emotionally reactive and cognitively effective way.

In contrast to the positive effects of handling, longer separations from the mother during infancy have been shown to lead to problematic outcomes. Two main paradigms have been utilized to examine the effects of longer separations from the mother. In maternal separation paradigms, the animals are removed from the litter for about one to eight hours per day (Knop et al., 2017), whereas in social deprivation paradigms, animals are removed for longer durations up to 24 hours per day. Maternal separations for six to eight hours lead to hyper‐ responsivity of the neuroendocrine system with increases in the production of neuroendocrine hormones such as corticosterone (Levine et al., 1991). Rats separated from their mothers for three hours per day showed greater alcohol dependency (drank more ethanol‐sucrose solution) than rats that were unseparated and those that were handled for 15 minutes per day (Huot et al., 2001). Longer durations of maternal separation and reduced maternal care lead to long‐term changes in the dopamine, oxytocin, and serotonergic systems, which in turn contribute to the observed increases in anxiety‐like and depression‐like behaviors (for a review, see Curley et al., 2011)

The lasting impact of maternal deprivation on developmental outcomes raises the question: what are the specific processes by which caregivers affect biology and behavior? Hofer (1978, 1994) suggested that mothers affect their offspring’s physiology via a multitude of “hidden regulatory processes” such as provision of milk, tactile stimulation, and warmth. Hofer and his students demonstrated that certain regulatory processes affect specific physiological or behavioral processes but not others (Hofer, 1987). For example, they examined the factors that may prevent two‐week‐old rat pups’ 40% reduction in heart rate in response to maternal separa- tion. Although tactile stimulation or supplemental heat did not stop the reduction in heart rate, continuous infusion of milk into the pups’ stomach did maintain the heart rate at normative levels (Hofer, 1987; Hofer, 1971),

suggesting that mothers regulate offspring’s heart rates mainly by providing milk. Hofer and his colleagues also showed that although infant rats experienced a reduction in their growth hormone secretion when separated from mothers, this response was prevented via rigorous tactile stimulation in the form of brush strokes, sug- gesting that mothers’ tactile stimulation may be the hidden process that facilitates normative levels of growth hormone secretion (Hofer, 2006). In another study, they demonstrated that the mere presence of an anesthe- tized mother who could not interact with the infant rat was sufficient to reduce neuroendocrine stress reactiv- ity in response to novel stimuli, but the presence of food did not make the same impact (Stanton et al., 1988). Finally, rat pups that were kept in a warm environment after being deprived of maternal care and food contin- ued to show normal activity level relative to those placed in cold environments (Stone et al., 1976). These find- ings suggest that there are multiple hidden regulatory processes by which mothers facilitate the growth and healthy functioning of their infant pups, and that specific regulatory processes may impact specific physiologi- cal and behavioral processes.

*Effects of paternal deprivation in rodents.* Human family structures are diverse and complex. Some children are reared by their mothers and fathers, some are reared by two mothers or two fathers, while others are reared in single parent households. Some children are cared by their biological parents, some by their nonbiological parents while others are reared by a combination of both biological and nonbiological parents. Given the diversity in children’s experiences of family structure and parental care, it would be important to use animal models to understand the impact of deprivation from a specific type of caregiving, such as paternal caregiving, on offspring’s developmental outcomes.

Similar to work with humans, the majority of animal research has focused on the role of *maternal* parenting behaviors partly because most monkey and rodent species are reared primarily by their mothers. Fortunately, there are some rodent species including prairie voles (*Microtus ochrogaster*), Mandarin voles (Lasiopodomys mandarinus), and California mice (*Peromyscus californicus*) that are monogamous and display biparental parent- ing. For example, similar to humans, prairie voles maintain diverse family structures. In the wild, about one‐ third of prairie vole pups are reared by their mothers and fathers, about one‐third are reared by single‐mothers, and about one‐third are reared in small communal groups with their biological parents and several alloparents (Getz & Carter, 1996). Interestingly, the majority of virgin female voles display “alloparental behavior” when placed with non‐descendent pups, suggesting that they also demonstrate the ability to take care of nonbiologi- cal offspring (see Bales & Saltzman, 2016). Given the diversity in their family structures and complex social behaviors, species such as prairie voles are excellent models for investigating the specific roles of mothers, fathers, as well as the impact of “biparenting” and “alloparenting.”

An important body of work examined the role of paternal deprivation on offspring outcomes in prairie voles. Ahern and his colleagues (2011) conducted a series of experiments to examine the sex‐specific parenting behaviors displayed in biparental family units and the effects of paternal deprivation on offspring outcomes. In biparental family units, mothers and fathers did not differ in the extent to which they attended to their nests, a behavior important for the protection of the offspring. Mothers and fathers licked and groomed their pups at similar rates when they were alone with their pups; however, mothers licked and groomed their pups more than fathers did when both parents were in the nest, whereas fathers demonstrated more partner‐directed lick- ing and grooming than mothers did. These findings suggest that although some responsibilities such as nest attendance were shared equally by parents, there were sex‐specific findings in the care of the offspring and partners when both partners were in the nest.

To test the effects of “paternal deprivation,” Ahern and his colleagues (2011) compared single‐mother and biparental households. They hypothesized that, to compensate for the absence of the paternal caregiving, sin- gle mothers would lick and groom their offspring more so than mothers in the biparental units. Contrary to this hypothesis, there were no differences in the extent to which single mothers and mothers in biparental units licked and groomed their pups. The absence of fathers had a large impact on the extent to which pups received parental care given that mothers did not compensate for the absence of paternal care. Compared to females reared by both parents, females reared without fathers licked and groomed their pups less especially when rear- ing them without a male partner, and displayed lower rates of alloparenting when presented with

non‐descendant pups (Ahern & Young, 2009; Ahern et al., 2011). Both males and females raised without fathers were less likely to form normal pair‐bonding (Ahern & Young, 2009).

Research on the effects of paternal deprivation on offspring outcomes in mandarin voles yielded similar find- ings (Bales & Saltzman, 2016). Offspring reared without fathers displayed higher anxiety and reduced locomo- tor activity in an open field test ( Jia et al., 2009), showed impaired social recognition (Cao et al., 2014), and displayed less social behavior and higher anxiety in a social interaction test ( Jia et al., 2009). Males reared with- out fathers showed reduced play behaviors and more aggression toward unfamiliar females (Yu et al., 2012). Paternal deprivation had sex‐specific effects on the neuroendocrine system, such that paternally deprived females showed reduced glucocorticoid receptors and brain‐derived neurotrophic factor in the hippocampal formation, whereas males did not show such changes (Wu et al., 2014). Paternal deprivation also led to sex‐spe- cific changes in the dopaminergic system: reduced mRNA expression of two dopamine receptors (type 1 & type 2) in female offspring in later life but enhanced expression of these receptors in males (Yu et al., 2012). Overall, findings from monogamous biparental rodent species suggest that paternal deprivation has effects on both the physiology and behavior of the offspring, but that these effects are often sex dependent.

*Postweaning social isolation in rodents.* Both for humans and animals, social experiences that take place in childhood and adolescence play an important role for physical and mental health outcomes. In rodent work, the standard procedure used for examining the effects of social isolation in adolescence is the postweaning social isolation paradigm (Fone & Porkess, 2008). In this procedure, rodents are isolated from their dam and housed in individual cages on the first day of weaning typically until the day of testing. Isolation‐reared rats are housed in the same room as the control‐group rodents such that they can see, hear, and smell other rodents; however, they are prevented from socially interacting with them. Thus, this paradigm is designed to test whether deprivation from experiencing social interactions during the postweaning period without depriving pups from sensory stimuli (i.e., sight, auditory) impacts developmental outcomes.

Which developmental period does “postweaning” reflect? By the first day of weaning (postnatal day 20), rat cortex reaches 90% of the adult cortex. Children’s cortex reaches 90–95% of adult size by two to three years of age based on postmortem studies and around six years of age based on recent MRI work (Semple et al., 2013). Based on these estimates, the first days of weaning may correspond to the early childhood years. Notably, in rodent literature, the period from the first day of weaning to early adulthood is often referred to as adolescence (Lukkes et al., 2009). This period captures different developmental periods in rodents’ lives: puberty/preadoles- cence (postnatal day 21–28), early adolescence (pnd: 28–34), mid‐adolescence (pnd: 34–46) and early adulthood (pnd: 46–56; Lukkes et al., 2009). As such, the postweaning isolation studies aim to understand the extent to which the timing and duration of social isolation leads to lasting changes in rats’ biological systems as well as behavior. The postweaning period reflects an important time for engaging in “social play” with litter mates and peers.

Therefore, deprivation from opportunities to engage in “social play” is considered to be the main mechanism accounting for the effects of postweaning social isolation on rats’ behavior (Špinka et al., 2001). For example, although social isolation for the first 25 days after weaning led to heightened aggression and hyperarousal in novel environments, male rats that were allowed to have daily play bouts with a conspecific were protected from this effect (Einon et al., 1978; Potegal & Einon, 1989). Likewise, the effects of postweaning social isolation were not long‐lasting in species that do not typically engage in social play in adolescence (Lukkes et al., 2009). Thus, being deprived of social play may be a mechanism that can at least partially explain the effects of post- weaning social isolation on rodents.

Postweaning social isolation was associated with both cognitive and emotional deficits. It was shown to lead to poor cognitive outcomes including impaired rule learning, recognition memory, and prepulse inhibition of acoustic startle (see Fone & Porkess, 2008), and resulted in reduced social interaction, increased aggression and antisociality, and anxiety‐like behaviors; though the effects depend on the timing and duration of the social isolation as well as the sex of the rodent (see Fone & Porkess, 2008). In both male and female rats, social isola- tion experienced from pre‐ to mid‐adolescence (about 15 days) led to increases in anxiety‐like behaviors includ- ing longer latency to emerge in an unfamiliar open‐field and reduced defensive burying reflecting lower levels of proactive coping (Arakawa, 2005, 2007). In males, the majority of these anxiety‐like behaviors did not

disappear even after resocialization up to 90 days, suggesting that these behaviors are likely not reversible. Importantly, when male rats experienced the same duration of isolation in late adolescence, they did not show anxiety‐like behaviors. In contrast, in female rats, social isolation experienced in pre‐ to mid‐adolescence as well as experienced in adulthood led to anxiety‐like behaviors (Arakawa, 2007). These findings indicate that post- weaning social isolation leads to poor developmental outcomes in both males and females. However, in females, these negative effects seem to be reversible by resocialization experiences, whereas, in males, certain develop- mental impairments may not be reversible by resocialization, suggesting that the adolescence period may con- stitute a critical period for the effects of social isolation in male rats.

Postweaning social isolation has been proposed to lead to anxiety‐like behaviors by disrupting the function- ing of the neurotransmitter systems, specifically the serotonin and dopamine systems, which are known to modulate emotive behaviors and mental health systems (Lukkes et al., 2009). These systems follow a pro- tracted course of development and are not fully developed until early to late adolescence. Postweaning social isolation has been shown to alter the functioning of these systems in a brain region‐specific manner. For exam- ple, it leads to increases in serotonergic activity in the medial prefrontal cortex, but decreases in in the hip- pocampus and decreases in the dopamine innervation in the medial prefrontal cortex but increases in dopaminergic activity in the NAc in male rats (see Lukkes et al., 2009). It is also possible that social isolation leads to deficits in behaviors by affecting the interactions between serotonin and dopamine functioning within the limbic system (Lukkes et al., 2009). For example, activation of the 5‐HT serotonin in the medial frontal cortex has been shown to lead to decreases in the dopamine release in this region. Thus, it is possible that rather than having a direct effect on both of these systems, postweaning social isolation may alter the functioning of one of these systems, which may in turn, lead to disruptions in the functioning of the other system.

*Communal rearing as an enriched social environment in rodents.* The standard paradigm used to examine the impact of maternal caregiving on rodent pups’ development is housing the parent and her pups in one room in isolation from other rodents. However, under naturalistic conditions, rodent offspring are more typically reared by multiple female and sometimes male adults. Lactating mothers who rear their offspring in these communal nests were observed to display higher levels of sensitive caregiving such as nursing and licking and grooming behaviors during the postpartum period compared to mothers who reared their offspring alone (see Curley & Champagne, 2016). Compared to offspring reared in standard conditions, offspring reared in communal nests were shown to have more positive outcomes including increased exploratory behaviors, reduced anxiety‐like behaviors, more social behaviors, and increased hippocampal and hypothalamic nerve growth factor (see Curley & Champagne, 2016). The enhanced developmental outcomes of communally reared offspring are likely a function of receiving increased responsive caregiving from mothers and other adults.

*The role of temperament in rodent social behaviors and social isolation.* Rodents’ temperament, particularly behavioral inhibition, has been linked with the extent to which they spend their time socially with others and health‐ related outcomes. Cavigelli and her colleagues (2009) assessed rats’ behavioral inhibition based on their latency to approach to novelty in both social and nonsocial situations. In social situations, rats were introduced to a novel rat placed in a wired cage; in nonsocial situations, they were introduced to novel objects. They defined behavioral inhibition as longer than median latency to approach to novelty in social and nonsocial situations. Based on this definition, 30% of any tested group showed behavioral inhibition in both situations. Notably, rats’ responses to social situations and nonsocial situations were unrelated: rats could be slow to approach novel social situations but not slow at approaching novel objects. Latency to approach an object in the nonsocial condition was relatively stable across four months, whereas latency to approach an unfamiliar rat in the social condition was not stable over the same time period. Similar to findings in humans, about 17% of rats demonstrated a stable pattern of behavioral inhibition in social situations assessed four months apart, and these inhibited rats continued to show behavioral inhibition at a third time point (for a review see Cavigelli, 2018).

Importantly, behavioral inhibition predicted shortened life span (Cavigelli, 2018). Stable inhibition during *social* situations, however, was a better predictor of life span than inhibition during nonsocial situations, sug- gesting that wariness toward unfamiliar peers may be particularly detrimental to health and thus lead to shorter

life spans (see Cavigelli, 2018). This may be because social wariness toward unfamiliar peers may increase stress levels, and lead to the “wear and tear” on the body. It is also possible that behaviorally inhibited rats may inter- act less with other rats and may not effectively use social partners to reduce their stress levels.

There is some evidence suggesting that behavioral inhibition leads to shorter longevity by altering the func- tioning of the neuroendocrine system. Behaviorally inhibited rats were shown to have 20–30% more basal glucocorticoids than noninhibited rats (Cavigelli et al., 2009), and greater levels of basal glucocorticoids in young adulthood predicted shorter life spans (Cavigelli et al., 2009). Notably, inhibition during social situations was a better predictor of basal glucocorticoid production and glucocorticoid reactivity than inhibition during nonsocial situations, suggesting that wariness in social situations may play an especially important role in alter- ing the basal functioning of the neuroendocrine system. Behavioral inhibition was also associated with poorer cardiovascular system functioning (higher heart rate and blood pressure), which may be another mechanism by which behavioral inhibition may be linked with shorter life span (see Cavigelli, 2018). Finally, behavioral inhibition was associated with poor immune system functioning (an accentuated inflammatory response), which may also explain why this temperament trait may lead to shorter life span (see Cavigelli, 2018).

Although behavioral inhibition in infancy has been linked with greater basal glucocorticoid production and behavioral inhibition in later life, social experiences in adolescence were shown to moderate these associations (Caruso et al., 2014). Specifically, behaviorally inhibited rats that were housed with novel social partners in adolescence showed less exploratory behavior in adulthood compared to those housed with familiar social partners. On the other hand, behaviorally noninhibited rats that were housed with novel social partners in adolescence showed lower increase in basal glucocorticoid production and increased exploration in adulthood compared to rats that were housed with familiar rats. As such, rats that were noninhibited as infants displayed behaviors and physiology linked with behavioral inhibition. These findings suggested that relatively short‐term social experiences in adolescence may lead to changes in the stability of temperament as well as glucocorticoid production.

### Conclusion and Future Directions

As reviewed in this chapter, nonhuman animal research has not only produced empirical findings that guide our understanding of how social deprivation and isolation impact developmental outcomes, but also played an important role in the formation of theories such as Bowlby’s attachment theory that have guided a fruitful body of research with humans. Although this chapter has primarily focused on nonhuman animal research, particularly Rhesus macaque. and rodents, there is also an extensive body of work examining the impact of social deprivation and social isolation in humans. For example, one form of social deprivation that is experi- enced by some children is growing up in institutional settings such as in orphanages. In such settings, children are often deprived of consistent and emotionally responsive caregivers due to factors such as high staff turn overs and rotations, high child to caregiver staff ratios, and insufficient staff training (Smyke et al., 2007). This form of social deprivation has been shown to have long‐lasting negative impact on children’s brain, social, and cognitive development (Hostinar et al., 2012; van Ijzendoorn et al., 2011). These findings are largely consistent with the nonhuman animal research findings reviewed in this chapter.

An important question that nonhuman animal researchers examined is to what extent the adverse impacts of early social deprivation are reversible when social deprivation is terminated. In human research, there is one project that was specifically designed to answer this question: the Bucharest Early Intervention Project (BEIP). The BEIP is a randomized control trial that examines whether children who are removed from institutional care and placed into a high‐quality foster care home show better developmental outcomes compared to those who have remained in the institutions, and equivalent or worse developmental outcomes compared to chil- dren who have never been institutionalized. Findings from this project show that children who receive the foster care intervention show better developmental outcomes compared to children who have remained in the institutions in certain areas such as social functioning and intelligence (see Nelson et al., 2019), suggesting that termination of severe social deprivation and transitioning to a responsive caregiving setting help boost the

development in certain domains. Moreover, in certain developmental outcomes such as brain electrical activ- ity, findings suggested that children who received the foster care intervention not only showed better develop- mental outcomes compared to the children who remained in the institutions, but also showed equivalent outcomes compared to those who have never been institutionalized (Debnath et al., 2020), suggesting that some of the adverse effects of institutional care may even be reversible. On the other hand, foster care inter- vention did not have a detectable positive effect on outcomes such as executive functions, which refers to goal‐directed cognitive skills (Wade et al., 2019). Thus, it might be that the effect of early social deprivation on such outcomes may not be reversible or may be reversible if children are removed within the first six months of development (Colvert et al., 2008). These findings are consistent with that of Harlow’s findings suggesting that the effects of early social deprivation are partially reversible depending on the duration of the social dep- rivation and timing of terminating social deprivation (Harlow & Suomi, 1971).

Although there is a good amount of human work examining the impact of institutional care or maternal deprivation on child outcomes, few studies have examined whether the impact of social deprivation or recov- ery from social deprivation depends on the child’s sex. Given the evidence from rodent work suggesting that there may be sex differences in whether or how well rodents recover from social deprivation after resocializa- tion (Arakawa, 2007), it would be important to understand whether the impact of social deprivation or chil- dren’s recovery from social deprivation depends on children’s sex. Answering such questions is only possible if studies include large enough samples to be able to compare males and females within the same study. Given the difficulties of conducting research with children who experience social deprivation, recruiting large enough samples is not always possible.

There is also limited research examining what type of social experiences may compensate for maternal or paternal deprivation experienced during different developmental periods. In rodent work, communal rearing with multiple caregivers raising their offspring together have been linked with positive developmental out- comes. Based on this evidence, it would be important to examine which types of communal rearing may pro- mote children’s development. Likewise, it would be important to examine the support of other relatives in child developmental outcomes, as well as whether and how these support mechanisms help children recover from early social deprivation experiences in a more efficient way.

To conclude, research with nonhuman primates and rodents have produced a rich body of work on the impact of social deprivation and social isolation on development. By allowing for greater ability to manipulate the environment, animal research have been useful for identifying the exact mechanisms by which caregivers or social partners may regulate distinct biological and behavioral systems, and explaining how the type of social deprivation (mother, father, peer or community), its timing and duration impacts offspring’s development. In terms of future directions, it will be important to continue to cultivate dialogue between human and nonhu- man animal researchers and examine questions related to the impact of early social experiences to determine whether certain findings are generalizable across different species.

The Origins of Beneficial Solitude: Psychoanalytic Perspectives

In the domain of psychoanalysis and in numerous psychoanalytic theories, solitude, as a *state of being alone*, has been described as a fundamental and potentially *beneficial* human experience and has been ascribed a variety of meanings (Buchholz, 1997; Modell, 1993; Storr, 1988; see also Coplan, Bowker, & Nelson, Chapter 1). However, there have been few psychoanalytically informed empirical studies on beneficial (or potentially beneficial) soli- tude as a *personality enhancing* and *constructive* experience of aloneness. In contrast, from the psychoanalytic standpoint, loneliness, as the *painful experience of being alone*, has been the topic of a few well‐known studies, published some decades ago (e.g., Fromm‐Reichmann, 1959; Klein, 1975), and more recently (e.g., Quinodoz, 1991/1993), by clinicians. Empirical investigations into the origins of beneficial solitude from various psychoana- lytic perspectives, however, are appropriate and potentially useful, for the following three reasons: (i) psychoa- nalysis has placed much emphasis on the decisive role of early life experiences, therefore the origins of solitude are also of great importance; (ii) most psychoanalytic models focus on what is the essence of solitude, that is, on the complex relation between the inner/private and the outer/social realm of human experience; and (iii) psy- choanalysis, as a psychotherapeutic method based on a two‐person relationship and aiming at uncovering the unconscious layers of personality, is expected to alleviate loneliness and promote beneficial aloneness.

In the chapter, several psychoanalytic views on the origins of beneficial solitude, its developmental course during the first years of life and its implications for later development will be discussed and evaluated, organ- ized around three dimensions: the solitary self, the ability to be alone and the necessity of being alone, as well as the companionable nature of solitude. Finally, conclusions will be drawn and future directions will be described, concerning the paradox of solitude, which I argue is evident from the beginning of life.

### The Solitary Self

##### Autoerotism, Primary Narcissism, and Secondary Narcissism

The concepts of autoerotism, primary narcissism, and secondary narcissism are very important in the under- standing of the origins, first manifestations, and development of the solitary self. According to Sigmund Freud (1905/1953), in the beginning of life the sexual drive is supported by the self‐preservative instinct (i.e., *anaclitic relationship*). This means that it is the vital function of nourishment, mainly from the mother (her breast or breast substitute), which satisfies the infant’s instinctual drive and provides pleasure, with the mouth being the first *erotogenic zone*. Thus, when the sexual drive detaches itself from the need for nourishment, it is directed toward the infant’s own body. This is the state of *autoerotism*, a typical manifestation of which is thumb suck- ing. By responding to the infant’s need and reducing his/her excitation, the mother provides a compensation for the infant’s typical sense of *helplessness,* thus creating an *original experience of satisfaction* (Freud, 1895/1966).

This is the context within which the *wish* emerges, that is, the individual’s impulse to cathect (i.e., invest) an animate or inanimate object with libido (i.e., psychic energy associated with the drives) and connect with it and with the satisfaction it provides. During the mother’s absence, the infant seeks to repeat the remembered real experience. Relying on the memory image of the mother, the infant creates, with his/her own body and in a hallucinatory manner, a perceptually identical experience – a process called *hallucinatory wish fulfillment*. As a consequence, both the real and the hallucinatory satisfaction become the foundation and the prototype of the wish, which is what makes us human.

Gradually, the infant proceeds in unifying his/her body image and establishing the ego, cathected with libido. This means that the infant is in a state of *primary narcissism,* in which the self and the object are undifferentiated (Freud, 1914/1957b). Later, Freud (1916–1917/1963) regarded primary narcissism as the first stage of life, prior to the emergence of the ego and not different from autoerotism, which came to be regarded as the sexual activ- ity typical of the narcissistic stage.

In Freudian theory, development is conceived as a gradual differentiation of the subject from the object, as the process of cathecting objects (initially the mother) and as the reduction of omnipotence. Although primary narcissism declines by the end of infancy, the ego is still cathected with libido, and an energy balance between ego libido and object libido occurs (i.e., an increase in the one entails a decrease in the other). Moreover, the residues of primary narcissism are manifest throughout the life span in the individual’s ego ideal (e.g., ideals, ambitions). However, a regression to primary narcissism is likely, even from the early years of life, and takes the form of the reinvestment of the ego, which means that libido is withdrawn from objects, and the narcissistic identification with objects, which means relating with objects on the basis of ego libido. This state is called *secondary narcissism* and is observed, albeit with varying degrees and qualities, in both normal and pathological psychic organizations (Freud, 1914/1957b).

Autoerotism and primary narcissism seem to represent a state of *primary aloneness,* in Freudian theory. The infant is immersed in omnipotent self‐sufficiency, in which satisfaction is achieved through an equally omnipo- tent other, who is not perceived as a separate being and is not yet internalized by the infant. This undifferenti- ated state may be regarded as an aloneness state because it is an objectless or pre‐objectal period of life, during which, paradoxically, being one with the caregiver reduces the typical infant helplessness and ensures survival. However, Freudian texts reflect an ambivalence toward the infant’s ability to perceive a separate other from the start. For example, in one of his earliest essays Freud (1895/1966) articulated the existence of another, a *fellow human‐being*, early in infancy. He argued that the relation with this being, the mother, who is the first object of love and hate, and the only source of help, is the context within which “a human‐being learns to cognize” (p. 331). If a *mirror relation* is what characterizes primary narcissism (in mythology Narcissus was in love with his own image or the image of his twin sister), then, as Laplanche and Pontalis (1967/1973) argued, it is not an objectless state. Put differently, it is an aloneness state in the sense that the infant experiences the mother as a “mirror” or “double” of his/her emerging ego. Furthermore, during moments when the infant is inevitably alone, he/she may not be overwhelmed by despair, but is able to sustain the investment on his/her own body and the outer world by resorting to *fantasy* as a means of wish fulfillment.

In addition, the notion of secondary narcissism may be regarded both as expressing *defensive withdrawal* in front of pressure and *beneficial solitude* enhancing creativity (see Paulus, Kenworthy, & Marusich, Chapter 19). Evidence supporting this argument comes from Freud’s own life experiences. When recollecting the early years of his career, Freud (1914/1957c) admitted that he suffered from loneliness, caused mainly by the difficulties he encountered in his psychoanalytic investigations and in the reception of his ideas by his contemporaries. Therefore, he seems to have experienced a mixture of involuntary and voluntary isolation, which was “not without its advantages and charms” (p. 22). He described this solitude as freedom from daily pressures and as a domain of discoveries, creativity and originality, which required effort and courage but yielded much *narcis- sistic gratification* – he felt as Robinson Crusoe in that “glorious heroic age” (p. 22). *Splendid isolation* (a term used to describe the British foreign policy) was the name Freud used for this beneficial solitude (in a letter to Jung; see Freud et al., 1976), which was a necessary prerequisite for scientific contribution. I argue that, when revealing his own experiences of aloneness, isolation, and solitude, Freud is referring to secondary narcissism, as described above.

Further evidence supporting that *voluntary isolation* when faced with adversity is likely to be a regression to primary narcissism (i.e., secondary narcissism) comes from Freud’s (1930/1961) famous essay on civilization. He argued that in order to avoid the suffering which stems from human relations, we withdraw ourselves, and in the resulting state of peacefulness, we search for solutions – on our own. We may build a private world through, for example, working, creating in art and science, and enjoying art and beauty, or by surrendering ourselves to intoxicating substances. This withdrawal is a form of defensive self‐protection, but it can also be a context of psychopathology. However, secondary narcissism should be balanced with what seems to be a *neces- sity*: object relations in a community (for this balance see Paulus, Kenworthy, & Marusich. Chapter 19). Hallucinatory wish‐fulfillment, as solitary connection with oneself and others in fantasy, is not enough. Freud (1914/1957b, p. 85) concluded in his essay on narcissism: “A strong egoism is a protection against falling ill, but in the last resort we must begin to love in order not to fall ill, and we are bound to fall ill if, in consequence of frustration, we are unable to love.”

##### The Stimulus Barrier

As described above, in Freudian theory the initial state of the human being is that of autoerotism and primary narcissism. The stimulus barrier seems to be the mechanism that ensures the preservation of this way of being. Freud (1920/1955a) first described the stimulus barrier as an innate organization that functioned as “a protec- tive shield against stimuli” (p. 27) in the neonate. This protection against noxious, overwhelming stimuli is regarded as a more important function for the vulnerable neonate than the reception of stimuli.

Freud (1920/1955a) has ascribed a biological‐neurological character to this metaphor. He regarded it as a sensory and perceptual threshold for incoming stimuli, an external membrane, under which other, deeper lay- ers exist. The stimulus barrier is the forerunner of an intermediary between the id and the external world, which later came to be called the *ego*. Therefore, the stimulus barrier is a threshold for internal stimuli too. Tension is reduced and homeostasis is maintained through this barrier.

However, this merging of biological and psychological concepts has led to some confusion about the stimu- lus barrier (Esman, 1983). Daniel Stern (1985/2000) was critical toward this concept because Freud had placed it in the framework of autoerotism and primary narcissism, a conceptualization that Stern disputed. Other writers from the psychoanalytic field have reformulated the concept. According to Esman (1983), the stimulus barrier is “an innate, selective, maturing screening mechanism” (p. 204), an active mechanism with a dual *self‐ regulatory function*: (i) to accept stimuli of certain kind and intensity and (ii) to ward off other stimuli, according to the degree to which these contribute to the adaptation of the organism. In this regard, the stimulus barrier seeks to preserve optimal stimulation (Esman, 1983; Gediman, 1971). This means that the infant both seeks and avoids stimuli. The avoidance of stimuli is facilitated through this innate, idiosyncratic organization and through the protection provided by the mother, who seems to function as a stimulus barrier herself (Benjamin, 1965; Khan, 1963). Search for stimuli promotes attachment and avoidance of stimuli is the forerun- ner of defenses and individuation (Shapiro & Stern, 1980) – one could also add here of the capacity to be alone. The stimulus barrier is regarded by many to be present throughout life and to evolve from a more passive mechanism into a *complex ego function* (Furst, 1978; Gediman, 1971). This means that throughout life the indi- vidual is well‐equipped when he/she needs to minimize internal and external distractions and achieve a level of self‐regulation, all of them necessary for being able, on his/her own, to deal with challenges and vicissitudes or engage in various forms of creative activities.

A breach in the stimulus barrier, caused by the penetration of stimuli, may be called *trauma*. However, trauma can be the result both of overwhelming excitation and of stimulation deprivation. Both situations can be acute or chronic, as well as cumulative. Stimulus infatuation and stimulus hunger are the two sides of the same coin: whereas the individual wishes to reduce the effect of a stimulus, he/she continually searches for new similar stimuli. What is usually avoided is the human relation in favor of other stimuli. Thus, the individ- ual’s inability to feel satisfied, *fed*, when on his/her own may stem not only from deprivation and from a strong stimulus barrier but also from chronic overload and a weak stimulus barrier (Gediman, 1971). *Withdrawal*, in the form of a *better‐be‐alone‐than* tactic, emerges then as a defensive response, and in Freudian terms, may be

regarded as an expression of secondary narcissism (discussed above). In light of the aforementioned text, the simultaneous desire and aversion toward stimulation (i.e., craving to escape solitude while struggling to protect it) becomes a less‐puzzling paradox.

##### Normal Autism and Symbiosis

Inspired by the Freudian views discussed above is the *separation‐individuation theory*, which was formulated by Margaret Mahler (Mahler et al., 1975). In this theory, two concepts – normal autism and symbiosis – are rele- vant to the study of beneficial solitude. More specifically, according to this theory, immediately after birth the infant is a profoundly alone and helpless being. In the first two months of life – the *normal autistic phase –* the infant lives in an *autistic shell*, which does not lead to disorganization. Instead, the stimulus barrier, the omnipo- tence stemming from the satisfaction of biological needs, and the hallucinatory wish‐fulfillment protect the infant from the *awareness of isolation,* which could be overwhelming for his/her immature ego. The controver- sial claim that this normal developmental phase could be called *autistic* initiated an intense scientific dialogue. In 1982, Mahler admitted that this is a phase of adaptation in extrauterine life, during which “the newborn has to achieve physiological homeostasis, that is, adequate inner regulation in synchrony with the vocal and ges- tural rhythms of the caregiver [. . .] each infant is *an active partner in the early dialogue*” (our emphasis; Bergman, 1999, p. 5). In a personal communication with Stern in 1983, Mahler also suggested that the autistic phase could have been named *awakening* (Stern, 1985/2000, p. 235), a term very similar to Stern’s emerging sense of self. Pine (1994), Mahler’s collaborator, described a *relative autism*, which he considered as “primary attunement to internal physiological stimuli” (p. 10).

Following the *autistic* period, separation‐individuation theory suggests that the infant’s experience is one involving *social symbiosis*. The infant emerges from the autistic shell and enters a *dual unity*, that is, an undif- ferentiated state with mother, with “the delusion of a common boundary” (Mahler et al., 1975, p. 45). Omnipotent symbiotic fusion protects the infant from the *awareness of separateness* (which is different from separation) and thus from the premature frightening realization of aloneness. In the light of infant research, Pine (1994, 2004) proposed that this phase is critical for the experience of *moments of merger* (e.g., undifferenti- atedness, boundarylessness) that can emerge during nursing (for a discussion of oneness experiences, see suc- ceeding text). It is then that merging becomes highly significant, not only for the infant but for the mother as well, and reaches a kind of resolution, different for each mother–infant dyad.

In a similar line of thought, Thomas Ogden (1994) introduced a primitive infantile state, which he named *autistic‐contiguous position*. In the beginning of life, the relation to the object is a sensation experience, that is to say, the infant feels the object (mainly the breast) at the skin surface. Ogden adopted the concept *autistic shapes* and *autistic objects* introduced by Tustin (1990) for high‐functioning autistic children, but, like Mahler, he did not refer to the psychopathological condition of autism. Rather, he described a realm of personal isolation, an experience of *being‐in‐sensation*, which serves as a sanctuary in the face of stress inherent in human relationships and is an essential part of aliveness (Ogden was inspired by Winnicott’s theory, which is discussed in the next section). It is as if the infant suspends life in the world of objects by creating an autonomous and insulated realm of nonhuman, machine‐like sensation shapes. Although self‐generated, this position develops only if the mother has the capacity to allow her infant to exist for some moments without her and to wait.

Taken together, the psychoanalytic insights on the solitary self and its origins suggest that solitude plays an important role in protecting the infant from disorganization caused by excessive internal and external excita- tion, in a time when his/her ego functions, responsible for self‐regulation, are not yet developed. In all these views, there is an implicit recognition that the infant’s solitude is at first a state of primary narcissism and, after the emergence of specific object relations, evolves into secondary narcissism, as Freud conceptualized these states. However, although the infant is described as a rather isolated self‐system, he/she is protected by the premature and traumatic awareness of aloneness through fantasy and experiences of merger with the car- egiver. These two means of protection may be regarded as the prototypes of creativity and engagement with the world (both animate and inanimate), which are the content of beneficial solitude throughout life.

##### Essential Aloneness, Noncommunicating Self, and Going‐On‐Being

More than Freudian theory, it is the work of D.W. Winnicott that constitutes a hallmark in the understanding of the roots and the developmental significance of solitude, and especially its beneficial aspects. This theory is still influencing contemporary thought and research on this issue, both inside and outside of the psychoanalytic field. Winnicott (1988) argued for the existence of *essential aloneness* in the beginning of life, during a pre‐primi- tive stage of development. It constitutes a paradox because it is an *aloneness of predependence*; that is to say, the infant is not aware of his/her absolute dependence by the caregiver. This notion also implies primary narcis- sism, the illusion of omnipotence, and mother–infant undifferentiatedness. Aloneness is regarded as *a primary state*, not as *the* primary state, which means that other possible primary states are not excluded (Eigen, 2008), such as companionship and sharing.

The *noncommunicating self* makes its appearance during the first year of life. Then a change occurs in the perception of love objects, from the *subjective object* to the *objectively perceived object*, in other words, from merg- ing with mother to separateness (Winnicott, 1965). With the use of symbols, the mode of communication changes from implicit and ambiguous to explicit and concrete. The infant leaves the area of omnipotence and enjoys communication. But at that time exactly, there exists an absolutely *private core*, which does not commu- nicate and always remains isolated, because it *has to* remain isolated. Winnicott (1965) wrote: “Although healthy persons communicate and enjoy communicating, the other fact is equally true, that *each individual is an isolate, permanently non‐communicating, permanently unknown, in fact, unfound*” (Winnicott’s emphasis, p. 187).

It is the game of hide‐and‐seek, in which “it is joy to be hidden but disaster not to be found” (Winnicott, 1965, p. 186). This mode of communication is not nonverbal but it is forever silent, personal, an indication of *alive- ness*. This view may be regarded to reflect the first signs of existential aloneness.

Winnicott (1965) also stated that health means (i) being able to use noncommunication in the sense of silent or secret communication with the subjectively perceived objects and (ii) the ability to lose contact with the commonly shared reality with the aim of feeling real and of preserving and enhancing the *true self*. Indeed, the more this *incommunicado element* (Winnicott, 1965) is under the threat of being revealed and altered, the more primitive are the defenses we employ to deal with this threat, because the protection of the innermost being facilitates the establishment of the true self. In this regard, Winnicott may be viewed as a predecessor of researchers who investigate the beneficial aspects of solitude today (e.g., mindfulness; see Leavitt, Butzer, Clarke, & Dvorakova, Chapter 24).

Every human infant has a true self, expressed through *spontaneous gesture* and recognized by the *good enough mother*. Mother *mirrors* the infant, that is, responds with sensitivity and reliability to his/her needs, thus facilitat- ing the development of the true self in the infant (Winnicott, 1971). The infant feels alive, a *psychosomatic entity*, with *continuity of being* (Winnicott, 1958, 1965). This fortunate state is reflected in the infant’s capacity to be creative and use symbols (e.g., language, symbolic play, dreaming), which form the content of his/her time spent alone.1

In the beginning of life, the *good enough* environment responds to the infant’s needs, and therefore the infant experiences a state of undisturbed isolation, a state of *going‐on‐being*. The infant leaves this isolation to express his/her spontaneous gesture and explore the environment, without losing his/her sense of self. But if the envi- ronment *impinges* on the infant’s existence (e.g., by intruding or demanding compliance or by inconsistent responding), the experience of being without having to react continually to external stimulation is broken. The infant returns to his/her isolated state, but this isolation is now comprised of primitive defenses. A *split* occurs between the true self, which needs to be protected from being violently altered by the environment, and a *false* or *compliant self*. The individual is incapable both of being with himself/herself due to the terror of isolation and of developing genuine object ties because the true self, not enriched by lived experience, must remain hid- den (Winnicott, 1958).

Winnicott (1965) later became more explicit in distinguishing the modes of not‐communicating. Apart from simple not‐communicating (a kind of resting), there exists a mode of active or reactive not‐communicating. *Active not‐communicating* is a form of voluntary, potentially beneficial aloneness, whereas *reactive not‐communi- cating* is a pathological state, the result of environmental impingement. Therefore, it is one thing to be *isolated*,

that is, acknowledging and preserving this core of self, and another thing to be *insulated*, that is, falsely living in a world devoid of real objects. And Winnicott (1965) beautifully portrays this private universe:

[. . .] we have to recognize that aspect of health: the non‐communicating central self, for ever immune from the reality principle, and for ever silent. Here communication is not non‐verbal; it is, like the music of the spheres, abso- lutely personal. It belongs to being alive. And in health, it is out of this that communication naturally arises. (p. 192)

Winnicott’s views reflect a developmental and clinical conceptualization of the origins and first manifesta- tions of aloneness and solitude as well as their vicissitudes. In this conceptualization, the mother plays a crucial role in the quality and destiny of her child’s solitary experiences. Manifestations of voluntary, beneficial alone- ness are evident from the first months of life. Aloneness is regarded as a fundamental way of being and is in a dialectical tension with connectedness, which means that both are needed for normal development and enrich each other. However, Winnicott goes as far as identifying a core of the infant’s self (probably a facet of the unconscious) which is – and will always remain – absolutely “solo,” idiosyncratic and isolated, and, thus, has to be respected by caregivers as such.

##### Schema‐of‐Being‐With‐the‐Self

Another view on the solitary self in infancy is provided by the work of Daniel Stern (1985/2000, 1994, 1995), who, although inspired by psychoanalytic thinking, was one of the main proponents of *intersubjectivity* – a theory highly relevant to the study of solitude. He introduced a layered model of development that was later revised (Stern, 1985/2000) to include three *preverbal senses of self* – emergent, core, and subjective (or intersub- jective) – all emerging together and in interaction with each other (rather than occurring successively). Under the influence of infant research (e.g., Beebe & Stern, 1977; Trevarthen, 1979), Stern supports the view of the *initial dualism*, which means that intersubjectivity is present from the beginning of life or that the self is with a differentiated other from the start and gradually develops new forms of relatedness.

Of relevance to beneficial solitude is the *self‐in‐the‐presence‐of‐the‐other* (Stern, 1985/2000), which reminds us of Winnicott’s notion of the capacity to be alone in the presence of the mother (discussed in the following section). It is a variation of the self‐being‐with‐a‐self‐regulating‐other and refers to the infant’s experience of being alone, with his/her perceptions, feelings, thoughts, and actions, in the physical proximity of the car- egiver. Even more relevant to the study of solitude is the *schema‐of‐being‐with‐the‐self*. This concept is inspired by Winnicott’s (1965) notion of going‐on‐being (see previous section) and Tustin’s (1990) work with high‐ functioning autistic children. It represents the way of being with one’s own, without other people around, “a state of mentally floating, alone” (Stern, 1995, p. 108), during which mental activities take place, but the individual does not pay attention to them. Stern (1995) wrote of a friend of his who had such an experience and who seemed to enjoy the beneficial aftereffect of solitary moments: “Such moments are experienced as free mental ambling, quite pleasurable, refreshing, and often productive, because when she breaks the moment and ‘returns’, she often does so with solutions to problems and questions that were pressing just before” (p. 108).

Stern (1995) further argued that when we are alone, “something is always happening” (p. 109), such as inten- tionally prolonging a peaceful moment in order to keep a state of equilibrium. This is a *feeling shape*. This *moment* of lived experience is “a‐way‐of‐being‐with‐the‐self ” or, better, “a‐way‐of‐one‐part‐of‐the‐self ’s‐being‐ with‐another‐part‐of‐the‐self.” It is as if the individual observes his/her complex mental operations from a distance, without interfering, without the need to complete a task and offer a product. The moment is *interper- sonal* in two ways: (i) it is “a‐negative‐way‐of‐being‐with‐someone,” because it reduces consciousness and intru- sions and (ii) it is a way for a part of the self to be with another part of the self.

The schema‐of‐being‐with‐the‐self has the same structure as the schema‐of‐being‐with‐an‐other (Stern, 1995). Both schemas use the same kinds of constants, are built around feeling shapes, acquire a narrative form, and are characterized by interpersonal motives and functions. “These experiences structure subjective time, much as music can. Such structuring not only organizes but heightens the sense of existing” (Stern, 1995, p. 108).

Stern’s (1985/2000) conception of intersubjectivity includes the acceptance (influenced by Winnicott) that some experiences are *non‐shareable,* perhaps because they are never *attuned* with by the mother. Total psychic transparency leads to psychopathology, as much as the inability to share experiences leads to alienation and loneliness. From infancy, we live in between these two poles. Being‐with‐a‐self‐regulating‐other means co‐dis- covering a balance between self‐disclosure and privacy. In ill health, the lack of attunement by the mother cre- ates in the infant a feeling of uncanny aloneness. In Stern’s view, loneliness is felt *only if sharing has taken place and then has been lost*. Finally, with the emergence of *language* during the end of the first year of life (sense of a verbal self and other), the infant is more likely than before to experience the inability to share some experiences not only with others but also with the self. Paradoxically, language creates a *split* between the lived and the represented experience, thus contributing to estrangement, while simultaneously enabling the infant to share his/her state of “‘being‐with’ others in intimacy, isolation, loneliness, fear, awe, and love” (Stern, 1985, p. 182). With the advent of symbolic function, the *domain of the private* is established between the false self and the true self; it contains all experiences that are not shared, but are not disavowed, which means that they are accessible by language and changeable through experience.

In conclusion, it is remarkable that, although Stern formulated a theory for the interpersonal world of the infant and was a proponent of intersubjectivity, he also acknowledged the infant’s need for aloneness and linked it with adult experiences of beneficial aloneness. Schema‐of‐being‐with‐the‐self – a notion combining cognitive and psychoanalytic traditions – implies that from early on the individual is capable of a rather stable representation of a non‐shareable self, complemented by the representation of a self‐in‐a‐relationship. Of major importance for the understanding of the creative use of aloneness is Stern’s view about the paradox of language. The emergence of language, early in life, marks the end of the possibility for a complete understand- ing, through all senses, of oneself by a significant other, because of the chasm it produces between the real and the symbolized experience. However, only with language can the individual fill and enjoy this empty space as well as share, as far as this is possible, his/her aloneness experiences with the other.

##### Idiom

Following Winnicott, Christopher Bollas (1989) posited that each human being has a true self, which may be called idiom, “an inherited set of dispositions” (p. 10), a “unique nucleus” (p. 212), which is present before object relating. The idiom meets culture and, through their dialectic, the psychic life of the individual develops. It is a form of knowledge that Bollas (1989) named the *unthought known*, in the sense of knowledge that exists from the beginning of life but has not been thought out.

It depends on the familial environment how much of this thought will be employed in a child’s life. When the environment facilitates the expression of the idiom, it has a *transformational* effect on the infant who experi- ences a kind of pleasure, which Bollas (1989, p. 19) describes with the Lacanian term *jouissance*, “the subject’s inalienable right to ecstasy.” In other words, parents set the foundation for what Bollas (1992) called *being as character*, and is conceptualized as the child’s ability to let his/her idiom be expressed by getting absorbed in playing (the process of play), even if this expression is not without risks (i.e., “what will happen to me if I sur- render myself in playing?”).

The idiom reflects the fundamental and primary aloneness of the individual; “solitude is the container of self ” (Bollas, 1989, p. 20). Bollas (1989) defined this inevitable and authentic aloneness as follows:

In our true self we are essentially alone. Though we negotiate our ego with the other and though we people our internal world with selves and others, and though we are spoken to and for by the Other that is speech (Lacan’s theory of the Symbolic) the absolute core of one’s being is a wordless, imageless solitude. We cannot reach this true self through insight or introspection. Only by living from this authorizing idiom do we know something of that person sample that we are. (p. 21)

By creatively combining the ideas of Winnicott and Lacan, Bollas describes aloneness as a (genetic) predis- position and fundamental condition, out of which the individual’s character emerges. Aloneness is regarded, therefore, as a unique nucleus of self, called idiom, which will always remain in a solitary state, that is,

unthought, unknown, unspoken, and non‐shareable. This means that the human being, although “individual,” will always remain internally “divided” between the unconscious and the conscious aspects of self. However, from the beginning of life this solitary nucleus is destined to encounter the outer world and be in a dialectical tension with it. It is only when family acknowledges and respects the child’s uniqueness, allowing it to be “lived” in everyday interactions, that the child becomes able to develop his/her psychic life, based on mutual enrichment between the idiom and the environment.

### The Capacity to Be Alone

###### Fort‐da

The wooden reel or *fort‐da* game, which is the famous developmental observation made by Freud (1920/1955a) on his 18‐month‐old grandson, clearly demonstrates the child’s ability to deal with solitude caused by the inevitable brief separation from his mother. In the game, the child repeatedly held the reel by the string that was tied around it and threw it in such a way that it disappeared into his cot; then, he pulled the reel again until it reappeared. This act was accompanied by the utterance *o‐o‐o‐o* (from the German word *fort*, which means *gone*) upon disappearance, and *da* (which means *there*) upon reappearance. The same child also used to look at a mirror, then fall on the floor and utter the words *Baby o‐o‐o‐o*, which means that he could make his image *gone*. In an earlier version of this game, he had the habit of throwing several small objects away, a game accompanied again by *o‐o‐o‐o* (here only disappearance was enacted).

Freud’s (1920/1955a) interpretation of the game was that the child, “during this long period of solitude” (p. 15), was able to renunciate the instinctual satisfaction caused by the mother’s presence, an ability that consti- tutes a major cultural achievement for the human being. In addition, by constructively repeating and working through disappearance and reappearance, the child transformed his passive experience of separation and soli- tude into an active one; he became master of the situation through binding. Thus, the distressing experience of separation from the mother can be a great source of gratification and pleasure if it is expressed in the symbolic level (i.e., words, playing), already from the second year of life. Indeed, Freud (1920/1955a) notices that this game may have been beneficial for the little boy, “a successful piece of self‐discipline,” as he wrote in an earlier study (Freud, 1900/1953), because when his mother died, about four years later, the boy did not show signs of grief. It seems that the game had prepared him for this irreparable loss.

##### Negative Hallucination

Based on several Freudian views, among which are the importance of absence, hallucinatory wish fulfillment (discussed in previous sections), and the notion of the negative, André Green (1986) used the term *negative hal- lucination* to describe a normal developmental phenomenon taking place in the early mother–child relation- ship. The inevitable separation from the mother leaves the infant physically alone. The relationship with her will be preserved only if the increase of tension or excitation caused by her absence is negativized by the infant. This means that the empty and silent space between the mother and the child will be occupied by the negative hallucination of the mother, which consists of primitive (i.e., hallucinatory or satisfying in fantasy) representa- tions of the mother, and is defined by Green (1999, p. 276) as “a representation of the absence of representa- tion.” The mother’s negative presence is transformed into a *framing structure* for the ego, enabling the child to wait and to tolerate absence as well as the related depressive affect. The framing structure “holds” the mind (in the Winnicottian sense) and constitutes the matrix of future (erotic and aggressive) investments.

Reflecting on Green’s views, I argue that this desirable outcome seems to have three developmental anteced- ents: (i) separation from the mother is not too prolonged, in order to avoid her effacement or fading away in the mind of the infant; (ii) the mother is available, reliable, and warm, in order to facilitate the emergence of the primitive representations and to ensure that the infant experiences holding and containment; and (iii) the mother is not an all‐present and intrusive figure, but is able to withdraw discretely leaving the infant alone for a reasonable amount of time, so that her perception be replaced by her representation. Negative hallucination

is the child’s own creation, which means that his/her psychic space is expanded and gradually populated by representations. Such a rich internal life seems to be the necessary prerequisite for high‐quality aloneness expe- riences. However, this is not an easy task; the infant has to make much effort to address the issue of the moth- er’s absence and to deal with his/her aloneness, in other words, to engage in the *work of the negative* (Green, 1999), and in this work the mother plays a decisive role.

In general, the notion of the negative sheds a different light on the understanding of the origins of beneficial solitude because it shifts our attention from the mother’s presence (as attachment theory postulates; see Mikulincer, Shaver, & Inbal Gal, Chapter 3) to the mother’s absence. This absence, which entails the infant’s aloneness, is a crucial early experience; absence is regarded as negative presence, full of creative fantasies that enhance the inner world of the infant and stir his/her representational activity, therefore expanding his/her capacity to tolerate and enjoy solitude as well as to be patient until the mother returns. This occurs with one condition: the mother needs to alternate between presence and absence with a pace analogous to the infant’s ability to deal with aloneness. Otherwise, her image in the mind of the infant is effaced and the infant’s alone- ness becomes emptiness, a psychic hole that persists in later years and is likely to become the root of severe (mainly narcissistic and borderline) psychopathology.

##### Oceanic Feeling and Oneness Experience

The sublime aloneness experience, which is deeply rooted in what takes place in infancy, is perhaps the oceanic feeling and, in general, the oneness experience. The concept of the oceanic feeling (or feeling of the eternal) was introduced by Romain Rolland and discussed by Freud (1930/1961) in relation to primary narcissism dur- ing infancy. He defined it as “a sensation of ‘eternity’, a feeling as of something limitless, unbounded” (p. 64) and as “a feeling of indissoluble bond, of being one with the external world as a whole” (p. 65). By definition, this feeling occurs in solitude as in the contact with God, nature, or art but it may also take place in the most intimate connection with another human being, such as in love, where the sense of loneliness is expected to be eliminated. It may even take the form of an *ecstatic* or *mystic experience*. In attempting to formulate a *genetic* explanation of this experience, as he called it, Freud (1930/1961) regarded the oceanic feeling as the result of the regression to the state of primary narcissism, where there is no differentiation of the inner from the outer, or a restoration of limitless narcissism, a view later adopted by Mahler (Mahler et al., 1975) in her description of merger experiences (as noted previously).

More recently, Storr (1988) argued that the individual’s ability to feel united with another presupposes a high degree of ego organization and integration. It is a vital and highly subjective experience, with permanent posi- tive effects on the individual. Sometimes, such an experience may completely alter one’s life. The Freudian view that the oceanic feeling is regressive (i.e., the illusion of return to an infantile condition, to the bliss of a lost paradise) is dismissed. Storr (1988) considered creative activity, scientific discovery, childbirth, some forms of exercise, silence, and solitude itself as additional triggers for this experience.

Support for this view provides the encounter of psychoanalysis and infant research: merging is possible only if an intact, *bounded sense of self* is first established (Lachmann & Beebe, 1989); merger‐ or fusion‐like experiences reflect a capacity achieved only after the formation of a sense of self and other. The origins of both oneness experiences and the stable sense of self can be traced in early mother–infant matching, attunement, and repair of disruptions in attunement. Similarly, in more recent psychoanalytic thought (Chirban, 2000), it has been argued that only a well‐integrated and cohesive self can loosen its boundaries and feel high levels of intimacy with another. These *progressive*, rather than regressive, oneness experiences start with an energetic readiness, which is followed by immersion in the unity, and lead to a self‐transformation. They are characterized by time- lessness and lack of self‐consciousness, and a move forward, instead of a longing for past merger experiences. The distinction between *experiencing oneness* and *searching for* or *fantasizing oneness* is a crucial one, in that only in the former is the individual really engaged *in the moment* and able to experience all the beneficial outcomes.

In conclusion, all the above views seem to agree that, throughout life, oneness experiences, in which loneliness is diminished and aloneness is felt as heightening the sense of existence, stem from the well‐ attuned, euphoric moments of meeting between the infant and the mother in the first few months of life

(the prototype perhaps being the union of intrauterine life). During childhood, this limitless and timeless elation is usually experienced by the child when he/she is left alone and unbothered, so that he/she becomes immersed in play.

##### The Capacity To Be Alone and the Necessity of Being Alone

In a previous section I discussed the implications for the solitary self of Winnicott’s ideas on essential alone- ness, noncommunicating self and going‐on‐being. However, the greatest contribution of his theory to the understanding of aloneness is the brilliant conception of the capacity to be alone (Winnicott, 1965). This conception is at the heart of his developmental and clinical theorization and at the center of psychoanalytic insight on solitude. The capacity to be alone arises from a *paradox*: “This experience is that of being alone, as an infant and small child, in the presence of mother” (p. 30). The mother identifies with her infant during the first months of life, a state called *ego‐relatedness* or *object‐relating*. Gradually, the infant introjects this sup- portive mother and becomes able to tolerate and enjoy solitude. Therefore, if all goes well, no one is ever truly alone, as there is always someone there; and only in this *sophisticated aloneness* can the child unfold his/ her true self.

This facet of Winnicott’s conception can be regarded as the *necessity of being alone*, although he did not explicitly make the distinction between capacity and necessity (Schacht, 2001). The necessity of being alone is described in statements such as the following (Winnicott, 1965): “It is only when alone (that is to say, in the presence of someone) that the infant can discover his own personal life” (p. 34). The capacity to be alone is a major manifestation of emotional maturity and is not acquired by all individuals, whereas the necessity of being alone is universal.

Winnicott (1965) offered a comprehensive description of what we could call “solitude in the first years of life”: “The infant is able to become unintegrated, to flounder, to be in a state in which there is no orientation, to be able to exist for a time without being either a reactor to an external impingement or an active person with a direction of interest or movement” (p. 34). He also made the developmental claim that many individuals become able to enjoy solitude before the end of childhood and that some children “may even value solitude as a most precious possession” (Winnicott, 1965, p. 30). When discussing the noncommunicating self, he explicitly relates the ability for aloneness with the capacity to concentrate on a task, a major developmental aim during childhood (Winnicott, 1965).

The state *I am alone* passes through three developmental phases. The first one is the *I*, the phase of the integration or unit of the individual; “*I* includes ‘everything else is not me’” (Winnicott, 1965, p. 61). Next, comes *I am*, which signifies that the infant exists, is alive, although still vulnerable or even paranoid; he/she has a contact with reality (the not‐me) and is able to share with the use of the mechanisms of introjection and projection, which facilitate mutual enrichment. *Sharing* means, among other things, that his/her exist- ence is *recognized by others*. And finally, comes *I am alone*, which stems from the infant’s awareness that a reli- able mother exists for him/her. In this light, *loneliness* can be understood as arising in the *I am* phase (a close parallel to Klein’s [1975] depressive position). The infant, even under favorable circumstances, may experi- ence failures in sharing, the main failure being that he/she is not seen or recognized to exist or is not under- stood by the mother. Therefore, loneliness is lessened by the acknowledgment of his/her existence, by sharing itself.

A precondition for the development of the capacity to be alone is the transition from *object relating* to *object use*. Winnicott (1971) regards this transition as perhaps the most difficult developmental task, in as much as he viewed the capacity to be alone as a major manifestation of emotional maturity. It requires that the subject places the object outside the subject’s omnipotent control. In other words, it presupposes the recognition of the object’s existence as a separate entity, as having a life of its own in the world of objects. For this procedure to be completed successfully, the object must survive from its destruction (i.e., expression of aggression) by the subject.

The infant’s capacity to be alone – a capacity that develops throughout life – depends largely on *the mother’s capacity to be alone*. Primary maternal preoccupation, in the sense of the mother’s complete devotion to her

newborn baby, gradually subsides. Some failures of mother’s adaptation to her infant’s needs are inevitable, and this gradual *disillusionment* may be beneficial if it occurs according to the infant’s developing ability to cope with frustration. The mother’s past aloneness experiences, her own memories of time alone and of being cared for, contribute to this solitude *à deux* (*shared aloneness*), which is described by Winnicott (1965) as follows: “Ego‐ relatedness refers to a relationship between two people, one of whom at any rate is alone; perhaps both are alone, yet the presence of each is important to the other” (p. 31).

Thus, a very useful distinction between *withdrawal* and *benign aloneness* can now be made. Withdrawal is a defense against persecution fear or anxiety and against a potential danger of losing identification with that from which one withdraws. Benign aloneness reflects the tolerance of ambivalence and the ability to share soli- tude, that is, the ability to be alone in the presence of another person who is also alone and perceived to be alone (see Rubin, Chapter 29 for the origins of social withdrawal in childhood).

##### Linking and the Capacity for Thought

A clear connection between the mother’s absence and the ensuing infant aloneness, on the one hand, and the capacity for thinking, that is, a very creative outcome, on the other, may be drawn from the work of W.R. Bion, who formulated a theory of thinking. Bion (1967) introduced the concept of *linking* one object with the other, self with objects, and the good and the bad in one and the same object. Linking means the process of connect- ing among people, emotions, and thoughts. It leads the infant to establish *correlation*, which is the basis of true communication and of thinking. The capacity for linking develops early in life in a healthy mother–infant rela- tionship. In such a relationship the mother can *contain* the anxiety and the aggression that the infant projects onto her, and through her *reverie*, to return them to the infant in a modified, “detoxified” form, so that the infant can tolerate them and attribute meaning to them. Such a process transforms the raw (mainly physical and perceptual) elements, the so‐called *beta elements*, into *alpha elements*, which are storable and available in thinking, phantasy, memory, dreams, and in psychic life in general, and become *food for thought* (Bion, 1977).

According to Bion’s (1967) theory of thinking, thoughts are *preconceptions*. From the first experiences of satis- faction, which are provided to the infant by an actual breast (or breast substitute), the preconception meets a realization and becomes a *concept*. However, the mother is not omnipresent and omnipotent. Therefore, the frequent absence of the breast, which is experienced as a *no‐breast* or an *“absent” breast inside,* produces a frustra- tion in the infant; this frustration meets the concept and becomes a *thought*. When the infant can withstand frustration and his/her envy for the mother’s capacity for reverie is not too great, an *apparatus for thinking thoughts* (Bion, 1967) develops, in other words, a way of thinking that is based on the links between thoughts. The absence of the breast and the related frustration constitute for the infant a problem to be solved, which is at the root of thinking and *learning from experience*. Through introjecting a model of containment from the start, the developing person has the chance to feel coherent and contained when he/she is alone. Furthermore, the capac- ity for thinking implies that one’s existence is *re‐cognized* by another, a state that apparently reduces loneliness.

Bion’s views about the absent breast as well as the no‐breast inside the infant are relative to the notion of the negative as conceived by Green (discussed in a previous section). They also place great emphasis on the mother’s absent presence as a fundamental experience of existence. A significant contribution of Bion’s theory to the under- standing of mental health, and aloneness in particular, is that, when the linking process is facilitated by the infant’s genetic predisposition and the mother’s capacity for containment and reverie, the absence (the negative) becomes a fertile ground for thinking and learning. In other words, the mother’s absence and the resulting aloneness produce thoughts that exert pressure to be linked and develop into creative thinking – from the beginning of life.

### Companions in Solitude

##### Transitional Objects and Transitional Phenomena

Winnicott’s insights into the origins of aloneness and solitude (as discussed above) are accompanied by insights into the capacity to use aloneness in a beneficial manner. He proposed a third, *intermediate area of experiencing*,

located between the internal/psychic and the external/shared reality and enriched by both of them. This area is closely linked with the capacity to be alone (Winnicott, 1958, 1971). It is a *potential space* between the subject and the objects, which are beyond the subject’s omnipotent control. It is “a resting place for the individual engaged in the perpetual human task of keeping inner and outer reality separate yet interrelated” (Winnicott, 1971, p. 2).

In this area, transitional objects and transitional phenomena appear in the beginning of life, followed by the use of symbols and playing and finally by culture. The transitional object may be the thumb, a pacifier, a blan- ket, a teddy bear, a doll or, later, a hard object (e.g., a toy car), which is steadily available to the child. The tran- sitional phenomena are rather intangible states, such as the infant’s (musical) vocalizations, rhythmic movements, and other habits and rituals, which usually appear at the time before sleep. Parents acknowledge the use of the transitional object (e.g., they encourage their children to take it with them), which means that they allow for the experience of illusion. Transitional objects and transitional phenomena are considered healthy and universal. They constitute a significant part of time alone during infancy and toddlerhood, as well as a way of coping with the pain of loneliness even in childhood, as Winnicott (1958) claimed: “Patterns set in infancy may persist into childhood, so that the original soft object continues to be absolutely necessary at bed‐ time or at time of loneliness or when a depressed mood threatens” (p. 232).

Transitional objects and transitional phenomena are the first manifestations of *playing, shared playing,* and *creativity*. With advancing age, they lose their meaning and become diffused in the whole cultural experience. While playing, in the presence of the mother and in time alone, children *do things* in time and space and experi- ence a sense of control over the external world (see Coplan, Ooi, & Hipson, Chapter 8). Playing means joining as well as separating. The child experiences a connection of the inner with the outer, but at the same time he/ she achieves a *near‐withdrawal state* (Winnicott, 1971), characterized by preoccupation and the sense of being lost without losing the identification with the mother object. The child is able to forget himself/herself in a formless, unintegrated state, because the mother has been able to leave him/her alone and because she is avail- able “when remembered after being forgotten” (Winnicott, 1971, p. 48).

The person and *cultural experience* form a unit. Creative playing, in the first years of life, is the precursor of the capacity to draw from cultural heritage and to contribute to it. Interests in the inanimate world may be regarded as a type of object relations having an important self‐regulating function (Eagle, 1981). Winnicott (1971) aptly describes the potential space as “an infinite area of separation” (p. 108), which can be filled by playing, so that pain, in other words separation itself, can be dealt with effectively. In this line of thought, *separation anxiety* reflects a denial of separation, the incapacity to be alone. Winnicott (1958) described the case of an eight‐year‐ old boy who compulsively used a string to join things together in an attempt to deny his fear of separation from his mother, after having experienced her depression and some real separations from her. However, if the familial environment facilitates life in this area of potentially limitless opportunities for creativity, sepa- ration gradually becomes a *form of union* of the individual with the past, the present, and the future of his/ her culture.

##### Representations of Interactions That Have Been Generalized and the Evoked Companion

As described in the section on the solitary self, Stern (1985/2000) introduced a theory for the interpersonal world of the infant. In this theory he characterized ages two to six months as the most social period of life. During this time, the infant experiences a sense of *core self* and *core relatedness*, and organizes his/her experience of *being‐with‐an‐other*. This being‐with‐a‐self‐regulating‐other is the source of the *representations of interactions that have been generalized (RIGs)*, which are mental representations of generalized episodes of lived encounter with other people. Episodic memory plays a central role here. Every time such a representation is activated, the infant has in mind an *evoked companion*, which may be regarded as a protection against loneliness. Evoked com- panions can be activated all throughout life. Stern (1985/2000) wrote: “[. . .] because of memory we are rarely alone, even (perhaps especially) during the first half‐year of life. The infant engages with real external partners some of the time and with evoked companions almost all the time. Development requires a constant, usually silent, dialogue between the two” (p. 118).

In this sense, solitude is often populated. The infant is alone for a while, playing with a toy which the mother has previously animated or personified. This toy has become a self‐regulating *person‐thing*, a real companion in aloneness. The self is solitary and simultaneously social, as the infant’s experience is “an I‐experience with an other” (Stern, 1985/2000, p. 115), and not a *we* or merger experience, whether the other is a real other or an evoked companion.2

##### Imaginary Companions, Fantasies, and Daydreaming

Escape into fantasies and daydreaming is a basic premise of classic psychoanalytic theory. They stem from unsatisfied wishes and their fabric is wish fulfillment and correction of reality (Freud, 1908/1959a). Life in fan- tasy is expected to be the infant’s and child’s way of being when alone and to serve important developmental functions. More specifically, a very frequent fantasy for toddlers and preschool‐aged children is the *imaginary companion*. This companion is an invisible person or animal created by the child who talks and plays with it for a considerable period of time, as if this companion were real. It can also be a real personified object (e.g., a doll). Among the various psychoanalytic interpretations of the developmental functions of this creation is the one that stresses its importance in the child’s struggle against loneliness (Bender & Vogel, 1941; Benson & Pryor, 1973; Nagera, 1969). Neglect and rejection of the child, shift of the mother’s attention to something else, as, for example, happens when a sibling is born, and lack of real playmates before the child starts school, are some common sources of loneliness and motives for the creation of an imaginary companion. A deficit in the child’s life, a more or less serious narcissistic trauma, is compensated by this fantasy. Following is the narrative of a ten‐year‐old boy, an only child, who had experienced the death of a sibling, abandonment by his father, and neglect by his mother (Bender & Vogel, 1941):

I was playing and one day it seemed I had a brother and a sister – John and Mary. They come when I am very lonely, not when I am playing with the boys. They are very much like me. My brother is 9 and my sister is 10. They are very pretty. They play with me and only talk about games and where I was. They would ask why I have been bad all the time. They say if I will be bad all the time and never good they won’t come again. They are a great comfort to me when I am all alone. (p. 59)

The imaginary companion is usually endowed with good qualities: he/she is kind, smart, strong, loveable, neat, obedient, and thus accepted by parents (Nagera, 1969). Through this creation, the child feels accepted and loved by parents during a period when infantile omnipotence subsides, the gradual loss of idealized parental images takes place, and mourning reactions appear. The imaginary companion can be viewed as a *narcissistic guardian* (Bach, 1971; Benson & Pryor, 1973), as a *transitional self* (Klein, 1985) for all children, independently of the course of their development, and as a means of alleviating common loneliness and benefiting from inevitable solitude.

In addition to the imaginary companion, three types of conscious fantasies and daydreams have been explic- itly associated with loneliness and solitude: family romance, animal fantasies and the fantasy of having a twin. All of them are regarded as common themes of the pre‐latency and latency period (i.e., early, middle, and late childhood) and as arising from the child’s disappointment during the oedipal phase.

More specifically, family romance (Freud, 1909/1959b) is the child’s conscious belief that he/she is an adopted child or a stepchild, and that his/her real parents are nobler, stronger, and lovelier than those with whom he/she lives. It was Dorothy Burlingham (1945) who regarded family romance as motivated also by the wish to overcome loneliness emerging from the child’s disillusionment with parents and from his/her uncon- scious death wishes for them.

Animal fantasies usually reflect a denial of painful reality, as Anna Freud (1937) argued. The child creates an intimate connection with an imaginary animal companion, with the aim again to feel less lonely. The compan- ions do not need words to understand each other. These animals provide the child with unconditional love, faith, and devotion (Burlingham, 1945).

In the fantasy of having a twin, the imaginary twin substitutes the lost love object, that is, parents, and “is meant to fulfill many of the daydreamer’s longings, above all to keep him from solitude and loneliness” (Burlingham, 1945,

p. 208). A narcissistic trauma is at the root of this fantasy. By creating the twin, the child feels invincible, twice as big, strong, and smart, so that the sense of omnipotence is partly restored. Narcissism is hidden behind object love, loneliness is alleviated, and the capacity for beneficial aloneness through a rich fantasy life is enhanced.

### Conclusions

##### Beneficial Solitude as a Paradox

Various psychoanalytic views on solitude, and especially on its beneficial function as well as their implications for the understanding of the origins of solitude were presented and discussed. These views belong to different models, such as the Freudian drive/structure and the object relations model. In most of them, the infant is portrayed as a helpless, essentially alone, yet undifferentiated being. The main function of this lack of differen- tiation between the infant and the object world is to protect the former from the awareness of aloneness or of the absolute dependence from the caregiver, thus to help create a sense or illusion of omnipotence. The devel- oping individual gradually moves from a more or less profound narcissistic state, from a more or less impene- trable aloneness and encasement, to the internalization of good objects or good relationships, so that he/she is able not to feel lonely when alone but instead to thrive in solitude. Some writers recognize (although with notable variations) the existence of a private, more or less isolated, core of the self and the necessity or inevi- tability of detachment and aloneness experiences beginning in early infancy. Lack of respect for infants’ soli- tude is an equally traumatic experience as relational deprivation in this age period. The right to dwell in splendid isolation and the perils of solitude deprivation are also acknowledged.

A distinction is made between active/voluntary and reactive/defensive aloneness. However, solitude as a defen- sive stance is a not so clearly depicted issue and warrants further insight. There are differences among theorists as to the infant’s degree of activity or passivity exhibited in his/her solitary life. Solitude may be, on the one hand, a retreat in front of the pain inherent in human relations. On the other hand, it is also deemed to provide a fertile ground for the cultivation of authenticity, creativity, and genuine relationships, although few psychoanalytic authors paid attention to this matter, as well as to the simple restorative function of solitude. Polarities or conflicts between opposites (e.g., pleasure‐seeking vs. object‐seeking motives, separateness vs. union, dependency vs. autonomy, per- sonal uniqueness vs. similarity/conformity, privacy vs. sharing) form the core of several psychoanalytic interpreta- tions of solitude and are treated from different viewpoints. Infancy is the sensitive period for the development of various types of symbolic function, which, among other things, form the content of solitude and are, in combina- tion with the rich fantasy (even hallucinatory) life of the infant, the main routes to the reduction of loneliness. Experiences – either illusory and regressive or active and progressive – of unity as presymbolic experiences and as a way of transcending loneliness are also built during early infancy in the relationship with the caregiver.

Solitude is a *multifaceted paradox*, much as the self is (Modell, 1993), a paradox that is evident from birth or even before it. I argue that some facets of this paradox, as emerging from the psychoanalytic views discussed previously, are the following:

* The newborn and infant is an essentially alone but merged‐with‐an‐other being.
* There is an initial narcissistic (solipsistic) state coupled with social symbiosis.
* From infancy, we need solitary moments *and* object ties, for tension reduction and excitation alike.
* We are alone in the presence of the other, initially the mother (in the most fortunate cases), we are lonely in the presence of the other (in the rather unfortunate cases), and we fear being alone with the other (in the most unfortunate cases).
* Experiencing real loneliness (and not the terror of aloneness) and enjoying solitude are achievements made possible only through bonding and genuine sharing.
* The mutual recognition and sharing of aloneness in the mother–infant dyad leads to a healthy relationship.
* A part of the self communicates with other parts of the self.
* A variety of companions inhabit alone space and time.
* Separateness, absence, and loss are the preconditions for symbolic connectedness.
* The protection of a private core self is an outcome and prerequisite of genuine relations.
* One can be with the other only through the capacity to be an integrated self.

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To the question of whether the initial human condition is one of aloneness *or* connectedness, of monadic or dyadic existence, recent, research‐informed psychoanalytic views (e.g., Mitchell, 1997; Ogden, 1994) reply that it is *both*. A contemporary psychoanalytic suggestion (Eagle, 2011) for an integration of drive‐reduction and object relations theory provides additional support to the fact that solitude is a need for achieving self‐regula- tion and inner pleasure *and* a catastrophe when it opposes our inborn readiness for relatedness.

In order to understand the paradoxical nature of solitude and be able to benefit from aloneness experiences, it may be useful to take into account the notion of *negative capability*, introduced by poet John Keats in 1817 and applied in the psychoanalytic field by Bion (1970, 1992). Negative capability means that “man is capable of being in uncertainties, Mysteries, doubts without any irritable reaching after fact and reason” (Keats, 2002, p. 60). In other words, it is an attitude of openness and receptivity, which broadens psychic space. The individual is capable of keeping opposites in mind, thus enduring absence of connection, which is associated with the pain of loneliness, and fluidity, which is associated with the creative facets of solitude. *Un*sociability and social *dis*in- terest express this facet of the *negative*, that is, dwelling in aloneness without anxiety, but with the capacity to be patient, wait, and surrender oneself to this unsaturated state of open possibilities. It would appear that accepting the paradox of solitude and its dialectical tension – a paradox that can never be completely resolved – is a difficult yet major developmental and epistemological achievement.

#### Notes

1 Inspired by Winnicott’s notion of true self, Arnold Modell (1993) argued that the individual has a *private self*, present from the beginning of life. This private space is created as the free-floating libido (i.e., libido which has been with- drawn from animate objects) is invested on inanimate interests. These are our favorite activities, hobbies, inclinations, and talents, which emerge from the early years of life, and may be regarded as “objects.” Modell goes as far as to claim that the private self is a better term than Winnicott’s true self, because the former represents the authenticity and genuineness of the self, in other words, the individual’s unique essence, whereas the latter implies that there is a gen- eralized criterion about the amount of “trueness” an individual must achieve.

2 The RIGs and the evoked companions as well as the *silent* dialogue between the real and the evoked companions are highly consistent with Stern’s concept of the schema-of-being-with-the-self (discussed in the section on the solitary self and introduced ten years later, in 1995), although Stern did not make an explicit connection between them.

### Culture, Social Withdrawal, and Development

The significance of social interactions for human development has been extensively discussed and well docu- mented in the literature (Hartup, 1996; Piaget, 1932; Rubin et al., 2015; Sullivan, 1953). Social interactions provide opportunities for children to understand standards in the society for appropriate behaviors and to learn skills to cooperate with others and solve problems. The experiences of social interactions are important for children to develop self‐identity. In addition, social relationships that are formed through interactions are a main source of emotional support that children obtain in coping with challenges and stress in daily activities (see Rubin et al., 2015). Therefore, a low level of social participation (or spending time in solitude) has tradition- ally been viewed as a risk factor that may result in psychopathological functioning and adjustment problems in various areas, such as social incompetence, poor school performance, and negative self‐regard (e.g., Chen & Liu, 2016). Findings from empirical studies have largely supported these arguments (Coplan et al., 2004; Gazelle & Ladd, 2003; Rubin et al., 2009).

Solitude, as physical or perceived separation from others, may be driven by external or internal factors. Solitude due to external factors, particularly rejection or isolation by others, is robustly related to negative feel- ings and other socioemotional and cognitive impairments (e.g., Coplan, Zelenski et al., 2018; Rubin et al., 2015). Developmental researchers tend to pay much attention to internally driven solitude, which is typically referred to as social withdrawal. A main feature of social withdrawal is that individuals display solitary behavior or stay alone when opportunities to interact with others are available (Rubin et al., 2009). According to Asendorpf (1990), social withdrawal may be manifested in three forms – social avoidance, unsociability, and shyness, depending on the underlying motivations. Social avoidance, based on the combination of low social approach and high social avoidance motivations, represents active evasion of social interactions with others (Asendorpf 1990; Coplan & Armer 2007). Whereas little is known about the reasons for social avoidance, it is suggested that socially avoidant children may have experienced repeated and consistent exposure to negative peer treatments or display the behavior as a manifestation of social anhedonia and depression (Coplan, Ooi et al., 2018). Unsociability (or social disinterest or preference for solitude) is derived from a low motivation for social interaction; unsociable children lack a strong desire to play with others or express a non‐fearful prefer- ence for solitary activities although they may not actively avoid peer interaction (Coplan et al., 2013; Goossens, 2014). Finally, shyness is concerned with excessive wariness, unease, and self‐consciousness, and is characterized by an approach‐avoidant conflict, in contexts of social novelty or perceived social evaluation; shy children have the desire to interact with others (high social approach motivation) but their approach inclination is inhibited by social fear, anxiety, and lack of confidence (Asendorpf, 1991). Shyness shares conceptual overlap with related constructs such as anxious solitude (Gazelle & Ladd, 2003; Shell et al., 2014) and anxious with- drawal (Booth‐LaForce et al., 2012; Oh et al., 2008).

Most of the existing research has focused on shyness and its relations with adjustment. The results have indicated that in Western societies, shyness is generally regarded as indicating incompetence and immaturity and is linked to adjustment difficulties, such as peer rejection, victimization, and feelings of loneliness and social dissatisfaction (Coplan et al., 2013; Ladd et al., 2011). Relative to shyness, unsociability seems to be rela- tively benign (Rubin et al., 2009). Research has shown that from early childhood to adolescence, unsociability is not necessarily associated with internalizing problems or peer difficulties (e.g., Bowker & Raja, 2011; Coplan et al., 2004; Ladd et al., 2011). It has been argued that unsociability may become increasingly adaptive in ado- lescence because it is viewed as indicative of autonomy (Coplan et al., 2019).

In this chapter, we discuss how culture plays a role in the development of social withdrawal in childhood and adolescence. We focus on shyness and, to some extent, unsociability because little research is available on other forms of social withdrawal. We first review major methodological approaches in the study of culture and chil- dren’s social withdrawal. Then, we discuss children’s and adolescents’ shyness from a contextual‐developmen- tal perspective. Next, we discuss unsociability, regulated shyness, and other types of social withdrawal. The chapter concludes with some suggestions for future research.

##### Research Approaches in the Study of Culture and Children’s Social Withdrawal

Culture has been defined as the man‐made part of the environment, the shared lifestyle of a group of people, the beliefs and values in a society concerning how individuals should behave, the meaning system that individu- als use to understand the world, or other phenomena (Cole & Cagigas, 2010; Oyserman, 2017). Among the definitions, many researchers seem to prefer the one focusing on beliefs and values that are commonly endorsed in the society (Hofstede, 1994). This definition allows for interpretations of differences and similarities in behaviors, such as social withdrawal, across societies in terms of the potential role of culture. However, the notion of sharing of culture among people within a society or community creates conceptual and methodo- logical challenges for developmental researchers who are interested in understanding and examining how cul- ture is involved in individual‐level socialization processes (e.g., associations between specific socialization practices and social withdrawal) or developmental processes (e.g., contributions of social withdrawal to inter- nalizing problems or other developmental outcomes); it is difficult to establish logical and empirical links between the collective endorsement of cultural beliefs and values by a group and behaviors or developmental patterns that are displayed by individuals. For example, although research shows that Asian parents are more likely than European American parents to endorse power‐assertive, authoritarian parenting (Chao, 1994; Steinberg et al., 1992) and that Asian children may display higher level of shyness than European American children (e.g., Chen & Tse, 2010; Rubin et al., 2006), the relations among cultural values, authoritarian parent- ing, and children’s shyness are not clear (e.g., Chen, Dong et al., 1997; Chen et al., 1998).

As an approach to address the issue of the “sharing” aspect of culture, researchers may treat it as an indi- vidual‐level construct (Triandis, 1995), assuming that personal characteristics and experiences of each individ- ual affect his or her reactions to the influence of external cultural factors. Using this approach, researchers may measure culture by observing individual responses to culturally related questions in self-report questionnaires or to tasks that are used to activate a particular cultural mindset or experience (Oyserman, 2017; Singelis, 1994). The data allow for direct analysis of relations between cultural variables and child behaviors, interactions between cultural variables and socialization variables in predicting child behaviors, and interactions between cultural variables and child behaviors in predicting developmental outcomes.

The conceptualization of culture as an individual construct and the corresponding research approach, however, may not be consistent with the tradition of developmental research that views culture as a context for socialization and human development (Bronfenbrenner & Morris, 2006; Whiting & Edwards, 1988). Moreover, it is unclear to what extent cultural context is reflected by an individual cultural trait because individual reac- tions to specific tasks used to activate a cultural mindset or self‐reports on a questionnaire of culture are likely to be confounded with other personal characteristics and experiences. It is difficult to distinguish individual cultural and noncultural reactions or traits (e.g., collectivism vs. sociability; individualism vs. autonomy or assertiveness).

Studies of the acculturation of migrants or immigrants in the new environment and the effects of societal changes on individual behaviors may provide valuable information about how cultural experiences (e.g., accommodation to the new values, integration of diverse values, Berry, 1997) play a role in human develop- ment. Chen and Li (2012), for example, examined parenting attitudes and child behaviors during urbanization in China. The results showed that parents in urbanized families (families that changed the status from rural to urban residency) were more likely than parents in nonurbanized rural families to encourage sociability and assertiveness in child‐rearing (e.g., “I encourage my child to express his or her opinions in school and other public places.”). Moreover, urban cultural values promoted children’s sociable-assertive behavior through parental socialization effort.

Research on culture and social withdrawal has focused mainly on: (1) the display of socially withdrawn behavior among children with different cultural backgrounds; and (2) adults’ and children’s perceptions or views of socially withdrawn behaviors. Researchers have conducted a number of studies comparing children on the display of withdrawn behaviors using observations, self‐reports, and other methods (e.g., Bowker & Raja, 2011; Xu & Farver, 2009). For example, Farver et al. (1995) observed children’s play behaviors in pre- school settings and found that Korean American children engaged more in parallel and unoccupied play than European American children (see also Coplan, Ooi, & Hipson, Chapter 8). Chen et al. (1998) and Rubin et al. (2006) reported that toddlers in China and Korea displayed higher levels of behavioral inhibition than their counterparts in Australia, Canada, and Italy. In addition, numerous studies using self‐reports and peer‐nomi- nations found similar patterns between East‐Asian children and Western children in shyness and related behaviors (e.g., Chen & Tse, 2008; Gartstein et al., 2006). Compared with self‐reports, peer evaluations may provide more objective information about children’s behaviors. However, this method often does not allow for cross‐cultural comparisons on group means because the scores are typically standardized within the group.

Findings from research on the display of withdrawn behaviors among children in different cultural groups help us recognize the role of culture in the development of social withdrawal. However, there is a concern about the potential misinterpretation of the cross‐cultural similarities and differences because the behaviors that children display in different cultures may not have the same meanings. Therefore, an important task is to investigate the meanings of withdrawn behaviors of children in different cultures.

Researchers have explored cultural meanings of children’s withdrawn behaviors in Australia, Canada, China, Korea, South Africa, the United States, and several other countries (e.g., Ding et al., 2015; Rubin et al., 1999; van Zyl et al., 2018). A common strategy to examine cultural meanings of withdrawn behaviors is to assess individual reactions to hypothetical vignettes describing withdrawn behaviors. Heinrichs et al. (2006), for example, showed undergraduate students several vignettes related to social withdrawal and asked them to make judgments about the demonstrated behaviors in the vignettes. Consistent with the hypothesis, participants in group‐oriented societies ( Japan, Korea, and Spain) viewed withdrawn behaviors more acceptable than their counterparts in individualistic societies (Australia, Canada, Germany, the Netherlands, and the United States). Using a similar method, Schreier et al. (2010) found that youth in Latin America (Costa Rica and Ecuador) and East Asia rated withdrawn behaviors as more desirable than youth in the West. Bowker and colleagues (2016) studied Nigerian emerging adults’ perceptions of shy and unso- ciable behaviors through using vignettes. The participants did not show different attitudes toward sociable and withdrawn behaviors. Moreover, the participants viewed sociable behavior as having a greater negative social impact (e.g., students who act like this cause a problem in class) than shy and unsociable behaviors. The results may indicate a culturally unique understanding of sociable and withdrawn behaviors in Nigerian youth.

Rapee and colleagues (2011) asked participants to report their expected impact of withdrawn behaviors on the person’s social status and career. The participants rated how the person who displayed shy or outgoing behavior in the vignette would be liked among peers and how the behavior described in the vignette would affect the character’s future career (future career options, success in future career, future relationships with colleagues and bosses). It was found that whereas youth in Western countries viewed shy behavior as clearly less desirable than outgoing behavior, youth in East Asia viewed them as less different.

Research on individual views and beliefs about social withdrawal using self‐reports provides useful informa- tion about its cultural meanings. However, self‐report methods suffer from widely recognized limitations, such as biases in self‐reports due to social desirability effects (e.g., people in hierarchically structured societies seem to display greater social desirability concerns than in egalitarian individualistic societies) and group‐reference effects (e.g., people in different cultural groups may use different referents in their self‐reports) (see Schneider et al., 2006; van de Vijver, 2015). Moreover, culture is believed to represent the belief and value system that is reflected at multiple institutional, group, and personal levels (e.g., Super & Harkness, 1986). Individual self‐ reported views may not adequately and effectively capture cultural meanings beyond the personal level.

##### Exploring Culture and Shyness from a Contextual‐Developmental Perspective

According to Hinde (1987), whereas social interactions and relationships play an important role in shaping individual development by providing an organizing context for children and adolescents to learn and display socially appropriate behaviors, the process of social interactions and the organization of social relationships are guided by cultural values and norms. This view is consistent with Vygotsky’s cultural‐historical theory (1978), which asserts that sociocultural conditions in the society are the foundation for learning and modification of mental processes and that social practices or activities of human beings are a primary mediator of cultural influence on individual development. Largely based on Hinde’s view (1987) and Vygotsky’s theory (1978), Chen and colleagues (e.g., Chen, 2012; Chen & French, 2008) propose a contextual‐developmental perspective focus- ing on the role of social interactions in linking cultural values and individual functioning. According to this perspective, adaptive and maladaptive behaviors need to be understood and examined in the context of social interactions and relationships and from a developmental point of view. Specifically, when children display behaviors in social interactions, adults and peers evaluate the behaviors according to cultural norms and values. At the same time, adults and peers respond to the behaviors by expressing their attitudes (e.g., acceptance, rejection) toward the children. Social evaluations and responses in interactions and attitudinal/emotional pro- cesses in relationships serve to regulate the development of the behaviors. Specifically, positive evaluations and responses may reinforce the behaviors, whereas negative evaluations place pressure on the children to control or modify the behaviors. Moreover, social approval and encouragement help children develop positive self‐ regard and self‐feelings. In contrast, social disapproval and rejection may elicit anger and distress, especially if children are unable or unwilling to control the behaviors. The negative emotional reactions are likely to result in externalizing problems if they are directed toward others or internalizing problems if they are directed toward the self (Chen, 2020; Chen & Liu, 2016). In the section that follows, we discuss children’s shyness from the contextual‐developmental perspective.

*Parent and peer attitudes.* It has been argued that as major socialization agents, parents and peers are crucial in “transmitting” cultural influence on children’s behaviors (Chen, 2012; Super & Harkness, 1986). Consistent with the argument, research findings have indicated that cultural values concerning socialization goals and practices may be reflected in parental and peers’ attitudes toward social withdrawal in children (e.g., Chen, 2018). In Western cultures, an important socialization goal is to help children develop independence and self‐confi- dence (Maccoby & Martin, 1983). Social withdrawal, particularly shyness that is derived from internal fear and anxiety, is regarded as incompatible with the socialization goal (Rubin et al., 2009). Research in North America and Western Europe have shown that parents view shy, wary, and anxious behavior as indicating social imma- turity and thus often express negative attitudes toward the behavior (e.g., Hane et al., 2008; Rubin et al., 2009; Tani et al., 2014; van Zalk et al., 2011). When children display shy behavior in social settings, parents tend to respond with worry, disappointment, and rejection (Chen et al., 1998; Rubin et al., 2002; Tani et al., 2014). Moreover, parents may use high‐power and coercive strategies, such as direct command, reprimand, and pun- ishment, in their interactions with children in an effort to help them reduce shy behavior (Chen et al., 1998;

Rubin et al., 1999).

In many group‐oriented cultures, children are encouraged to learn behaviors that are conducive to interper- sonal harmony and group well‐being, such as cooperation, conforming to social norms, and self‐constraint,

whereas independence, self‐direction, and positive self‐regard are not highly valued in socialization (Greenfield et al., 2006). Accordingly, shyness seems to be more accepted in group‐oriented cultures than in Western indi- vidualistic cultures. Chen, Rubin et al. (1997), for example, found in a sample of school‐age children in China that shyness was positively associated with maternal acceptance and negatively associated with maternal rejec- tion. Chen et al. (1997) reported that shyness was negatively associated with parental high‐power parenting attitudes (e.g., “I do not allow my child to question my decisions,” “I believe that scolding and criticism make my child improve”) in Chinese children. Kim et al. (2008) found shyness was positively associated with social support from parents in Korea, whereas the association was not significant in Australian children. These results indicate that, unlike their Western counterparts, shy children in East Asia receive parental support, experience little pressure from parents to change their behavior, and, in general, live in a relatively desirable social environment.

Different cultural values are also reflected in peer attitudes toward social withdrawal. In Western societies, shyness is typically associated with negative peer attitudes, such as peer rejection or exclusion, because shy children are often seen by peers as incompetent and deviant (Rubin et al., 2009). In societies where social asser- tiveness and self‐expression are less valued, peers tend to have more positive perceptions of shyness and are more likely to accept shy children. Different peer attitudes toward children’s shyness have been found in a series of studies conducted by Chen and colleagues in the early 1990s in Canada and China (e.g., Chen et al., 1992; Chen et al., 1997). In an observational study conducted in 1996–1997 with samples of four‐year‐olds, Chen, DeSouza et al. (2006) found that peers were more likely to use direct demands, verbal teasing, or other negative social strategies when making voluntary initiations to shy children than to non‐shy children in Canada, whereas peers used similar strategies in their initiations to shy and non‐shy children in China. When shy children made social initiation, peers were more likely to display overt rejection, disagreement, and intentionally ignoring in Canada but responded more positively by showing approval and support in China.

It should be noted that social attitudes toward shyness in Chinese children have become increasingly nega- tive in recent years as China has changed rapidly to a competitive market‐oriented society in which individual assertiveness and initiative‐taking are required to adapt and achieve success in the environment. For example, Chen and colleagues (2014) and Yan et al. (2016) found in urban Chinese samples that children’s shyness was positively associated with parental power‐assertive parenting and negatively associated with parental support. In addition, several recent studies showed that shyness in childhood and adolescence was positively associated with peer rejection in urban China (e.g., Chen et al., 2005; Liu et al., 2015; Liu et al., 2018).

*Developmental outcomes.* According to the contextual‐developmental perspective, culture may affect the functional meaning of children’s behaviors as indicated in their developmental outcomes. In societies where shyness is viewed as an undesirable characteristic, children who display shy behavior may receive negative social evaluations, which in turn may make the children feel frustrated and distressed. The adverse social environment and negative reactions of shy children in turn may result in the development of adjustment problems. In societies in which shyness is viewed as more normal or even desirable, however, shy children may receive social support, which helps them learn skills to function in the society, form social relationships, and develop self‐confidence and positive self‐regard. In this environment, shyness may be associated with less problems and more positive developmental outcomes.

Shyness is generally associated with adjustment problems, including social incompetence, academic difficul- ties, negative self‐regard, and other internalizing problems in Western cultures (e.g., Hughes & Coplan, 2010; Rubin et al., 2009; Schmidt & Buss, 2010). Liu and colleagues (2015), for example, found that shyness is associ- ated with loneliness and depressive symptoms in Canadian children. In a 19‐year longitudinal study, Asendorpf et al. (2008) found that children rated as shy by their parents at 4 to 6 years old experienced more difficulties in establishing career and first stable partnership at the age of 23. Gest (1997) found in a longitudinal study with an American sample that shyness in childhood was associated with poor social relationships, low quality of life, and emotional distress in early adulthood.

Shyness seems to be associated with fewer negative outcomes in more collectivistic and less competitive societies. Kerr et al. (1996), for example, found that shyness was not related to career stability, income, or

education level in Swedish men, though it predicted later marriage and parenthood. Kerr and colleagues (1996) explained that Swedish society was not highly competitive due to the well‐established support and welfare system. Moreover, the egalitarian values endorsed in the society might guide people to view shy behavior posi- tively and thus reduced the differences between shy and the non‐shy men. Chen and colleagues (2009, 2020) explored, in a Chinese sample, how behavioral inhibition in toddlerhood, a temperamental antecedent of shy- ness, was related to social and school adjustment in childhood and adolescence. The results indicated that children who were inhibited at two years of age showed more positive social outcomes, such as peer preference and social integration, and positive school attitudes and academic achievement at age seven. Moreover, inhib- ited children in China continued to function competently in social and school adjustment in late adolescence. The data on behavioral inhibition in these studies were collected in early 1990s. Recent research (e.g., An & Eggum‐Wilkens, 2019; Liu et al., 2015; Liu et al., 2018; Nelson et al., 2015) suggested similar relations between shyness and adjustment problems in Chinese and North American children. In a study with Indian children, Bowker and Raja (2011) found that shyness was positively associated with loneliness and socioemotional diffi- culties, although the magnitude of the associations appeared smaller than that in North America. Taken together, findings from research programs in different countries indicate that cultural values may shape, to various extents, the developmental significance of shyness in terms of its relations with adjustment outcomes.

Xu and colleagues (2007) identified two distinct types of shyness in Chinese children, anxious shyness and the regulated shyness. Anxious shyness is a type of shyness that has been studied extensively in Western socie- ties; anxious‐shy children experience fear and low self‐confidence in social situations and are concerned about social evaluation. In contrast, regulated shyness refers to acquiescent, nonassertive, and unassuming behaviors such as “behaving modestly” and “not showing‐off,” in social interactions. Different from anxious‐shy children, regulated-shy children constrain their social initiative and activities in order to fit in the group and maintain group harmony. It is argued that children displaying regulated shyness are perceived as well‐behaved and polite (Özdemir & Cheah, 2015). A common feature of anxious shyness and regulated shyness is the low frequency of interactions that children display in social settings. According to Xu and Krieg (2014), however, the two types of shyness are associated with different adjustment outcomes. Research results have indicated that regulated shyness is positively associated with higher peer preference, effortful control, and prosocial behavior, and nega- tively associated with loneliness and internalizing problems, whereas anxious shyness is positively associated with social and psychological difficulties (Xu et al., 2007; Xu et al., 2014; Xu et al., 2008). Özdemir and col- leagues (2015) also identified these two types of shyness and found that they were similarly associated with indexes of adjustment among children in Turkey.

An interesting question is whether nonanxious regulated shyness, which seems to represent a regulated behavior based on self‐control, is similarly associated with positive adjustment outcomes across cultures (Chen, 2019). It appears reasonable to argue that the pattern of associations between regulated shyness and adjustment is cross‐culturally similar although the magnitude of the associations may be greater in cultures, such as East Asian cultures, that place higher value on the regulation of behaviors. A related issue is the associa- tions seem to reflect the constructive role of behavioral regulation, which tends to be positively valued and encouraged in most societies (Eisenberg et al., 2006; Zhou et al., 2009). If this is the case, Xu et al.’s work (2007) may be largely concerned with comparisons of shyness and regulation (or regulation in a specific form such as “not showing‐off ”), rather than different types of shyness. It will be interesting to examine these issues in future research.

##### Exploring Culture and Unsociability From a Contextual‐Developmental Perspective

Among the various forms or types of social solitude or withdrawal, shyness has received the most attention from researchers perhaps because: (1) it is believed to indicate social incompetence or failure to satisfy the personal desire for social interaction; (2) it is associated with negative emotions, such as fear, anxiety, and dissatisfaction; and (3) it represents a risk factor in the development of psychopathological outcomes (Rubin et al., 2009). Nevertheless, there is emerging interest in recent years in other types of children’s

social withdrawal. Among these types, *unsociability* has received increased attention from researchers, who have investigated its nature and developmental significance often in comparison with those of shyness (e.g., Chen et al., 2011; Liu et al., 2015). According to Asendorpf (1990), whereas shyness is derived from a combi- nation of high approach and high avoidance motivations in social settings, unsociability may reflect a com- bination of low approach and low avoidance motivations. Unsociable children have a low desire to initiate or participate in social activities but may not avoid interaction when others approach them (Asendorpf, 1993). In other words, although unsociable children initiate fewer social interactions than sociable children, they do not turn down social invitations (Bowker & Raja, 2011). Moreover, when involved in social interactions, they can demonstrate adequate social skills and be engaged similarly as their sociable peers (Asendorpf & Meier, 1993).

There are different, and even conflictual, arguments in the literature about the nature of unsociability in Western children. On the one hand, the theories that emphasize the role of social interactions in social and cognitive development (e.g., Cooley, 1902; Hartup, 1996; Piaget, 1932) suggest that unsociable children may miss out on the opportunity to learn from others and to practice their interpersonal skills, such as cooperation, negotiation, and problem‐solving, in social settings. As a result, these children may develop inappropriate behaviors, lack social support systems, and fall behind others in social and cognitive areas. In this sense, the developmental outcomes of unsociability may be similar to those of shyness. On the other hand, children in Western societies are expected and encouraged to develop autonomy and self‐direction (Grolnick, 2012; Maccoby & Martin, 1983; Ryan & Deci, 2000). Unsociability as a form of preference for solitude may be regarded as an autonomous expression of personal choice (Coplan & Armer, 2007; Leary et al., 2003). Thus, unlike shyness, unsociability may not indicate social failure or incompetence. Indeed, unsociability in early childhood, which is mostly indexed by solitary, quiet behavior (i.e., quiet exploration and solitary constructive activities) in social settings, is regarded as relatively benign (Coplan et al., 2018; Rubin, 1982). In adolescence and adulthood, engagement in solitary activities or spending time alone for self‐exploration, self‐reflection, or stress reduction is also thought to have benefits for well‐being (e.g., Goossens, 2014; Larson, 1997; Leary et al., 2003; Long & Averill, 2003).

The results of limited studies seem to show that unsociability is not necessarily associated with social and psychological problems (e.g., Asendorpf & Meier, 1993; Coplan et al., 2019; Harrist et al., 1997). Coplan et al. (2004) found that unsociability was related to longer attention span and less negative emotionality than shy- ness. Harrist et al. (1997) found no significant differences between unsociable children and nonwithdrawn children; both were more competent than shy children on social‐information processing tasks and teacher‐ rated social performance. Similarly, Coplan and Weeks (2010) found that unsociable children reported more positive school attitudes than others. Some findings indicate that relative to sociable children, unsocial children are viewed as less likable by others (e.g., Coplan et al., 2007; Coplan & Weeks, 2010). However, it appears to be the case that unsociable children are not more vulnerable than others to internalizing problems, such as depres- sive symptoms, loneliness, and social anxiety (Coplan et al., 2004; Coplan & Weeks, 2010; Coplan et al., 2013). Nelson and Evans‐Stout (2019) found that teachers viewed unsociability as indicated by solitary‐passive behav- ior as less undesirable than shy‐reticent behavior in kindergarten and elementary school children. Bowker and Raja (2011) argue that because they do not actively avoid opportunities for peer engagement, unsociable chil- dren may get just enough social interaction, which may allow them to avoid potential harms associated with social isolation. From a cultural perspective, the relatively “benign” outcomes of unsociability in Western chil- dren are inevitably related to the values of autonomy, self‐decision, and personal choice in the society. These values help reduce negative social evaluation and associated stress and distress that unsociable children experience.

In societies where interdependence and group affiliation are highly emphasized (Chen, 2010; Greenfield et al., 2006), individuals are encouraged to develop social connectedness and integration and commitment to the group. Children and adolescents are required to function in group context and to contribute to group well‐ being (Chen & French, 2008). Unsociability and preference for solitude are inconsistent with group orientation and are likely to lead to social disapproval in these societies. Unlike shy children, who have the desire to interact with peers but the social approach tendency is inhibited by social fear and anxiety (Asendorpf, 1991), unsociable

children display a lack of intention to interact with, and maintain distance from, others. Peers are likely to rec- ognize the behavioral manifestations of shy and unsociable children derived from different social motivations and react differently to them in interactions. In the group‐oriented context, whereas shy children may obtain support from others to engage in interactions, unsociable children may be perceived as deviant, selfish, and anti‐collective and thus may be isolated from others and have low social status (Chen et al., 2011). The undesir- able social experiences of unsociable children in turn may result in school difficulties and emotional problems, such as social dissatisfaction and feelings of depression.

Studies conducted in Chinese societies with Confucian collectivism as the primary principle in guiding social activities have consistently shown links between unsociability and pervasive adjustment problems (e.g., Coplan et al., 2016; Chen et al., 2011; Liu et al., 2015). Coplan and colleagues (2016), for example, found in China that, compared with “average” children, unsociable children were more likely to be isolated and victimized by peers. Moreover, unsociable children were rated by teachers as less competent, had more learning problems, and reported higher levels of loneliness and depression. In a sample of Chinese school age youth, Zhang and Eggum‐Wilkens (2018) found that peer‐reported unsociability was associated with peer rejection and exclusion and school maladjustment. However, self‐reported sociability was not associated with problems. The authors suggest that unsociable Chinese adolescents have difficulties with peers and at school only when they are per- ceived as unsociable by peers. It is likely that peer perceptions and evaluations serve as important mediators in the associations between unsociability and social and school problems.

An interesting issue is how the functional meaning of unsociability in children may be influenced by macro‐ level social, economic, and cultural changes. Chen et al. (2011) found in a rural region of China where tradi- tional values have been maintained that, whereas shyness was generally associated with indexes of adjustment (e.g., social status, teacher‐rated competence, and academic achievement), unsociability was associated with peer rejection and broad school and psychological problems (e.g., teacher‐rated learning problems, depression) in school‐age children. As individual independence and autonomy are increasingly encouraged in recent years in urban China, shyness in childhood has been found to be associated with maladaptive outcomes (e.g., Chen et al., 2005; Liu et al., 2015). The social change, however, has not evidently affected the meaning of unsociabil- ity; unsociable urban Chinese children still experience more adjustment difficulties than their counterparts in Canada (Liu et al., 2015). Researchers should investigate whether unsociable children become better adjusted as China continues to change toward a more urbanized society in the future.

##### Issues, Implications, and Future Directions

It has been argued that social interactions are important for children to understand norms and expectations for appropriate behaviors, learn various skills in social problem‐solving, form meaningful relationships with oth- ers, and obtain healthy psychological outcomes (e.g., Hartup, 1992). Thus, children who withdraw into solitude are often viewed as at risk for developing socioemotional and cognitive problems (e.g., Rubin et al., 2009). Research from different cultures suggests that this argument is not correct. Social withdrawal may be mani- fested in different forms due to different underlying motivations. As the major forms or types of social with- drawal, for example, shyness and unsociability may have different meanings and are associated with different developmental outcomes across cultures (Chen, 2019). Among the different types, however, only shyness has been extensively studied in Asian and Western societies, although researchers have recently paid increased attention to cultural influence on unsociability (Coplan et al., 2016; Bowker & Raja, 2011; Zhang & Eggum‐Wilkens, 2018).

Researchers have recently studied social avoidance (active evasion of social interactions) and its relations with adjustment (Coplan et al., 2018; Ding et al., 2019). Based on limited evidence, it appears that social avoid- ance is related to peer relationship difficulties and internalizing problems in different societies (Ding et al., 2019). Yet, it remains to be investigated what social avoidance means and how it is related to indexes of socioemo- tional functioning in different cultural settings.

Some other constructs that are related to social withdrawal include self‐conscious shyness (Eggum‐ Wilkens et al., 2015) and positive shyness (Colonnesi et al., 2013; Colonnesi et al., 2014 – see also Hassan

et al., Chapter 2). Self‐conscious shyness refers to emotional reaction to being socially exposed and the center of attention from others, especially authority figures. This type of shyness may be manifested as embarrassment and blushing (Crozier, 2010; Eggum‐Wilkens et al., 2015). It will be interesting to investi- gate self‐conscious shyness in different cultures. Positive shyness, which was recently proposed by Colonnesi et al. (2014), refers to the positive expression of shyness (i.e., coy smile) that infants use to regulate emo- tions in anxiety‐provoking situations. According to Colonnesi et al. (2014), positive shyness may serve to enhance prosociality, sociability, and trust. If this were the case, it seems reasonable to expect that positive shyness is generally associated with adaptive developmental outcomes, although culture may modify the associations depending on how it is supported by adults and peers during socialization.

Most extant studies on social withdrawal in children and adolescents have been conducted in Western and East Asian societies. It will be important to expand the research to other societies. Relatedly, it will be important to examine the processes through which cultural contexts shape the display and development of social with- drawal. According to the contextual‐developmental perspective (Chen, 2019; Chen & Schmidt, 2015), for exam- ple, cultural norms guide adults’ and peers’ evaluations of and responses to behaviors in social interactions, which in turn serve to regulate children’s behaviors. At the same time, children actively participate in social interactions through constructing cultural norms for group activities and reacting to social evaluations and responses. This perspective may help future explorations of the processes of cultural influence on children’s social withdrawal.

The implications of social change for individual development are an important topic in developmental sci- ence (Chen & French, 2008; Silbereisen & Chen, 2010; Zeng & Greenfield, 2015). It has been argued (Chen, 2015; Kagitcibasi, 2012) that although urbanization and modernization in many developing countries may allow for greater individual autonomy, social change may not necessarily weaken the significance of group‐oriented values. Traditional and new values may serve different functions in human development and thus may coexist through integration and organization. It will be interesting to investigate different types of social withdrawal in changing contexts.

Behavioral Inhibition and Psychopathology in Childhood

The construct of temperamental behavioral inhibition (BI) was introduced by Kagan to refer to children exhibiting fearfulness, withdrawal, and reticence in response to unfamiliar objects, people, and situations (e.g., Kagan et al., 1984; Kagan et al., 1987). BI overlaps with a number of constructs in the literature such as introversion, social withdrawal, and shyness (Rubin & Coplan, 2010; Martin et al., 2016), but is uniquely distinguished by reticence in both novel social and nonsocial situations. In contrast, introversion is a much broader trait construct that encom- passes a number of facets, including low levels of positive affect, sociability, assertiveness, activity, and excitement‐ seeking (Watson et al., 2015). Similarly, social withdrawal is a broad and heterogeneous construct that can include both an avoidance of, and lack of interest in, social interactions (Coplan & Armer, 2007). Whereas BI refers to reti- cence in response to a range of unfamiliar situations and stimuli, shyness refers to wariness and discomfort with unfamiliar people and in social‐evaluative contexts (Eggum‐Wilkens et al., 2015). However, as discussed below, shyness may be a developmental outcome of early temperamental BI (Kochanska & Radke‐Yarrow, 1992).

In this chapter, we briefly summarize the literature on the stability of BI and its expression across develop- ment. Next, we discuss factors that may influence the development and maintenance of BI. In the third section, we review the links between BI and risk for problematic outcomes in the areas of socioemotional functioning and psychopathology, including moderators of the development of psychopathology. Finally, we offer sugges- tions for future research to further elucidate the development and consequences of BI.

### Stability of Behavioral Inhibition

As a temperament trait, BI should be at least relatively stable, although some change is expected due to development and changing life contexts and events. Initial studies by Kagan and colleagues examined 21‐month old children classi- fied as having either high or low levels of BI based on structured laboratory observations. BI was moderately stable at ages 4 (*r* = 0.51; Kagan et al., 1984), 5.5 (*r* = 0.52; Reznick et al., 1986), and 7.5 (*r* = 0.67; Kagan, Reznick, Snidman, Gibbons, & Johnson, 1988) years. Scarpa et al. (1995) reported significant, but lower, stability for BI in a large, unselected sample of Mauritian children at ages 3, 8, and 11 years (*r*s = 0.10–0.21). In a longitudinal study, Gest (1997) reported moderately high stability (r = 0.57) for interviewer‐rated BI from childhood (mean age 10) to young adulthood.

In general, studies using laboratory assessments of BI and longer intervals show lower stability com- pared to shorter follow‐ups and studies using parent‐report measures (Pérez‐Edgar & Guyer, 2014). In addi- tion, samples of individuals selected for high and low levels of BI (e.g., the top and bottom 20% of the distribution) report greater stability relative to unselected samples (Pérez‐Edgar & Fox, 2005). Moreover,

elevated BI across multiple assessments is more stable than BI from a single assessment point (Kagan, Reznick, & Snidman, 1988; Scarpa et al., 1995). For example, Kagan and colleagues (1988) showed signifi- cant differences between inhibited and uninhibited children at age 4 only when including children who fell at the top and bottom of the distribution of behavioral inhibition at both 14 and 20 months. Thus, some children remain stably high and low on behavioral inhibition whereas others change across development. Moreover, children who are stably inhibited have higher rates of psychopathology than children whose level of BI changes (Hirshfeld et al., 1992).

The modest stability of BI may reflect measurement error, as lab observations and parent reports may be affected by many sources of variance besides trait BI. Alternatively, BI may encompass different subgroups or may be a multidimensional construct. Buss and McDoniel (2016) differentiate children who are inhibited across high and low threat contexts from children who are fearful only in high threat contexts. Children who are fear- ful even in low‐threat contexts exhibit substantially heightened stress reactivity (Buss et al., 2004), greater atten- tional bias away from threat (Morales et al., 2015), and social reticence into early childhood (Buss et al., 2013). Another source of heterogeneity may include the distinction between social and nonsocial fear. BI has tradi- tionally been assessed using laboratory measures that include both novel social and nonsocial contexts. However, lab measures of BI in social and nonsocial contexts are not significantly associated (e.g., Dyson et al., 2011). Moreover, Dyson et al. (2011) found that social and nonsocial BI had different correlates. For exam- ple, BI in social contexts was significantly associated with social, but not specific, phobias and BI in nonsocial contexts was associated with specific, but not social, phobias.

BI has been examined, and may be expressed, somewhat differently at different ages.

Kagan and colleagues have shown that high motor and emotional reactivity to novelty during infancy, as indicated by thrashing and emotional distress (e.g., crying), predicts inhibited behavior during the toddler years and may be an early expression of BI (Fox et al., 2015; Kagan & Snidman, 1991). When followed into preschool and kindergarten, behaviorally inhibited children tend to engage in more solitary play and show greater reti- cence in approaching social situations than their uninhibited peers (Coplan et al., 2009; Gersten, 1989; Rubin et al., 2002). As a result, these children may miss critical opportunities during formative years to develop adaptive social capabilities.

Caspi et al. (2003) found that as adults, children who were inhibited at age three were overcontrolled and nonassertive during social interactions compared to their less inhibited peers. Informants described them as being less affiliative and having less interest and being less engaged in daily activities. There were also sex dif- ferences in some outcomes. Inhibited girls were more likely to pursue marriage, homemaking, and mother- hood, while inhibited boys took longer to achieve conventional milestones such as marriage, fatherhood, and stable careers (Caspi et al., 1989).

### Factors Contributing to Development and Maintenance of BI

Kagan and colleagues (1988) suggested that BI resulted from an oversensitive amygdala, with a lower threshold for engaging a fear response, thereby heightening reactivity to unfamiliar and novel stimuli. In addition, there may be impairments in self‐regulatory processes prolonging the fear response and delaying a return to equilib- rium (Fox et al., 2005). In the next section we summarize data on genetic, biological, cognitive, and environ- mental risk factors associated with the development and maintenance of BI.

Genetics

Twin studies comparing concordance between monozygotic and dizygotic twins have found that BI is moder- ately heritable (Eley et al., 2003; Smith et al., 2012). For instance, Eley and colleagues (2003) found that genetic influences accounted for two‐thirds of the variance in shyness and inhibition among preschool‐aged children. Moreover, in the MacArthur Longitudinal Twin Study, there was moderate‐to‐substantial heritability of a latent variable reflecting multiple measures of BI at 14, 20, 24, and 36 months (Smith et al., 2012).

Although BI appears to be at least partially heritable, the specific genetic influences remain elusive (see Clauss, Avery, & Blackford, 2015 for a review). To date, the majority of molecular genetic studies of BI have used linkage analysis, which is generally underpowered for polygenic phenotypes, and candidate gene associa- tion studies, which are prone to false‐positive findings and fail to consider non‐hypothesized genetic variants that may be associated with the phenotype. Unfortunately, the preferred approach of genome‐wide association studies (GWAS) has not yet been applied to BI.

Most candidate genes in these studies are involved in regulating neurotransmitters and hormones implicated in anxiety and stress. Several studies have found an association between the short allele of the serotonin‐trans- porter‐linked polymorphism (5‐HTTLPR) and temperamental BI or shyness (e.g., Hayden et al., 2007). However, Johnson, Kryski et al. (2016) reported that in children with at least one copy of the short allele, BI was *less* stable from age three to five compared to children without a short allele, aligning with the view that the short allele is a marker of neural plasticity to context (e.g., Ford et al., 2014; Hankin et al., 2011). In other stud- ies, investigators have reported associations of BI with polymorphisms in the dopamine transporter (DAT; Davies et al., 2013), glutamic acid decarboxylase (GAD65; Smoller et al., 2001), and corticotropin releasing hor- mone (CHR; Smoller et al., 2003), genes. However, without adequately powered GWAS, it is difficult to assess the validity of these findings, nor to know what other gene variants are also associated with BI.

Brain Structure and Function

Structural and functional imaging studies of BI have focused on neural regions involved in automatic or “bot- tom‐up” processes, including the amygdala and hippocampus, which are involved in novelty detection and fear processing (Blackford et al., 2010; Davis, 1992), and “top‐down” regions involved in emotion regulation, reward processing, and cognitive control (i.e., the prefrontal cortex; Clauss et al., 2015). Studies examining brain elec- trical activity using electroencephalogram (EGG) among children with BI have reported associations greater right frontal asymmetry, which has been interpreted as reflecting a propensity toward withdrawal, as opposed to approach, behavior (Fox et al., 2005).

Structural MRI studies point to larger amygdala volume in BI and related phenotypes (Clauss et al., 2014). Individuals with a history of BI show structural differences including larger orbitofrontal cortex volume (Hill et al., 2010), decreased dorsal anterior cingulate cortex (dACC) thickness (Sylvester et al., 2016), larger caudate volume (Clauss et al., 2014), and smaller hippocampus volume (Kim et al., 2017). Unfortunately, many of these findings have failed to replicate, potentially due to differences in sample characteristics, image resolution, and imaging methods (Clauss et al., 2015).

A recent meta‐analysis of functional imaging studies identified several regions with increased activation in BI including the left and right amygdala, right globus pallidus/putamen, left caudate, and dorsolateral prefron- tal cortex (Clauss et al., 2015). Neuroimaging studies of adults categorized as behaviorally inhibited during early childhood have reported greater amygdala activation to novel versus familiar faces (e.g., Schwartz et al., 2003). Some studies have found evidence of a faster amygdala response to novel faces and longer duration of amygdala response to all faces in BI, rather than a greater initial peak response (Blackford et al., 2009). Faster latencies may suggest heightened sensitivity to novelty and threat detection, whereas prolonged activation may indicate diminished habituation (Blackford et al., 2012).

The longer duration of amygdala response after viewing novel stimuli may also reflect a failure of “top‐ down” inhibitory structures to dampen amygdala activation, particularly in the prefrontal cortex (PFC). Tasks examining anticipatory processing and planning for upcoming situations can elucidate the modulation of amygdala response by adaptive or maladaptive neural strategies. Clauss et al. (2011) found adults with inhib- ited temperaments had diminished dorsomedial prefrontal cortex (dlPFC) and dorsal anterior cingulate cor- tex (dACC) activity, but greater amygdala activation when expecting to see fearful faces, whereas uninhibited individuals showed smaller amygdala reactivity but greater activation in PFC. Likewise, Clauss et al. (2016) reported that children with BI failed to show the heightened PFC activation observed in uninhibited children when anticipating a threatening stimulus. These findings suggest that BI may be associated with heightened reactivity to aversive events as well as failure to engage adaptive regulatory and anticipatory coping strategies

(Clauss et al., 2015). In addition, studies of adults with a history of BI suggest that inhibited individuals may require greater PFC activation to engage additional adaptive strategies, including attentional control and conflict monitoring, to dampen amygdala response to potential threat ( Jarcho et al., 2013). Importantly, how- ever, the majority of MRI studies have examined structural and functional differences in adulthood, and therefore cannot address whether these differences were present in infancy/early childhood, or whether they could be a consequence of BI and its sequelae. Thus, studies examining neural correlates of BI beginning early in development with repeated assessments over time are needed to elucidate the role of neurobiological factors. The one area in which data of this kind are available suggests that young children who remain inhib- ited over time display greater EEG activity in the right, as opposed to the left, frontal hemisphere (Fox et al., 2001).

Attentional and Cognitive Mechanisms

Compared to their uninhibited peers, children with high BI show greater attention and heightened sensitivity to potential threats in their environment (Pérez‐Edgar, 2018; Pérez‐Edgar, Bar-Haim et al., 2010), process nov- elty and threat differently (Schwartz et al., 2003), and show differences in some aspects of cognitive control, such as error‐monitoring (McDermott et al., 2009). Previous studies suggest that attentional biases constitute a key phenotypic characteristic of BI (Pérez‐Edgar, 2018). For instance, children with high levels of BI show hypervigilance for novelty (Reeb‐Sutherland et al., 2009). Evidence of early global patterns of orienting are observable early in development, including increased visual fixation on and repeated “checking” of stimuli that infants without BI treat as benign or uninteresting (Pérez‐Edgar, McDermott et al., 2010).

Inhibited children’s avoidance of, and withdrawal from, novel stimuli may influence the subsequent develop- ment of higher‐order attentional and cognitive processes (Buzzell et al., 2018). For example, a number of studies have reported a link between BI and increased error monitoring as indexed by the error‐related negativity (ERN), an event related potential elicited after making an error on a speeded response task (Buzzell et al., 2017; Lahat et al., 2014; McDermott et al., 2009). Notably, this relationship does not emerge until later in childhood. Thus, Meyer et al. (2018) found that preschoolers with BI did not show an increased ERN at age six but exhib- ited a significantly greater ERN than their peers at age nine. This is consistent with evidence of associations between BI and ERN in older youth. For example, McDermott et al. (2009) reported that adolescents with a history of BI had a significantly larger ERN than adolescents with a history of low BI. Interestingly, associations of BI with error monitoring may be heightened in the presence of peers (Buzzell et al., 2017). Complementing research using ERPs, functional neuroimaging studies demonstrate that children with higher BI show increased activity in the cingulate cortex – a key region involved in performance monitoring – when exposed to stimulus conflict (Lamm et al., 2014).

In contrast, research does not consistently support a relation of BI with response inhibition (i.e., inhibitory control) and flexible switching between tasks (i.e., task switching; Buzzell et al., 2018). Although several studies have reported that performance on tasks designed to assess inhibitory control (i.e., go/no‐go) correlates with a history of childhood BI (Lamm et al., 2014; Thorell et al., 2004), a number of studies have failed to find such associations (e.g., Jarcho et al., 2013; Troller‐Renfree et al., 2019). However, this does not rule out the possibility that cognitive control processes moderate the association between BI and subsequent psychopathology, as dis- cussed below.

Parenting

As noted earlier, twin studies indicate that both genetic and environmental factors play a role in the etiology of BI. Parents are one of the most salient aspects of a child’s environment and effects of parenting practices on the stability of BI have been relatively well studied. Rubin et al. (2002) posited that there is a reciprocal relationship between BI and parenting, such that parents perceive highly inhibited children to be vulnerable and therefore engage in overprotective, intrusive, and/or overly solicitous parenting practices to avert dis- tress in their child. In response, children with BI become overly reliant on their parents and internalize the

belief that they are unable to independently cope with novel situations or engage in self‐soothing strategies, thus maintaining patterns of social reticence and impeding the normative development of social and prob- lem‐solving skills (Bohlin et al., 2005).

A number of studies have reported findings that are consistent with such a transactional model between temperament and parenting practices (see Ryan & Ollendick, 2018 for a review). Children’s BI predicts subse- quent overprotective, intrusive, and overly solicitous parenting practices (Kiel & Buss, 2011; Rubin et al., 1999). Conversely, parental overinvolvement, overprotection, and hostility predict children’s BI and social reticence with peers ( Johnson, Olino et al., 2016; Kiel & Buss, 2011). However, some studies have provided only partial support for this model. For example, Rubin et al. (1999) found that parental perceptions of shyness in toddler- hood predicted less encouragement of independence two years later, however failure to encourage independ- encedidnotpredictlatershyness.Importantly,noneof thesestudiescanruleoutthepossibilityof gene‐environment correlations. Thus, future research should use genetically informative designs to distinguish between parental environmental and genetic effects.

Although we have emphasized the role of genetic, neural, attention, and cognitive factors, and parenting in the etiology and maintenance of BI, other variables can play a role. For example, Johnson, Olino et al. (2016) found that lower levels of positive emotionality (PA) predicted greater stability of BI across childhood, suggest- ing that the approach and exploratory behaviors associated with PA may facilitate exposure and habituation to new contexts, reducing inhibition. Additionally, Fox and colleagues (2001) found that four‐month‐old infants who showed high reactivity were less likely to become inhibited as toddlers when they were placed in nonpa- rental care situations with one or more non‐sibling children. Thus, patterns of stability or change in inhibition may be influenced by a variety of internal and external factors.

Outcomes

In the following sections, we selectively review research on the outcomes of BI with a particular focus on soci- oemotional adjustment, the development of psychopathology, and moderators of the relationship between BI and psychopathology.

Socioemotional Functioning

As children with BI grow older, their core temperamental features are cognitively and socially elaborated, and this broader phenotypic presentation is often conceptualized as shyness, a personality dimension character- ized by self‐consciousness, tension, and unease in social‐evaluative situations (Cheek & Buss, 1981). Early BI continues to shape the quality of children’s day‐to‐day experiences, particularly within interpersonal contexts. For instance, longitudinal studies report that BI in early childhood predicts later social reticence with peers (Rubin et al., 2002). Despite wanting to participate in peer play, motivation to approach social interactions is dampened by anxious apprehension and discomfort. Numerous studies have linked BI with diminished social competence and ineffective communication skills (Penela et al., 2015; Walker et al., 2014). For exam- ple, children reported by their mothers as socially fearful at age two were observed to be less socially competent with peers and used communication styles that were unassertive and less direct six months later (McElwain et al., 2014).

These difficulties are compounded by the fact that peers view shy children as less attractive potential play- mates and friends. For example, children as young as five to six years report fewer affiliative feelings and less desire to play with a hypothetically shy child when given the option to play with a more sociable peer, even if ranking the shy child as more likeable (Coplan et al., 2007; Zava et al., 2019). Moreover, socially withdrawn and shy children are more likely than their peers to be rejected by their classmates (Boivin et al., 1995; Rubin, Chen, & Hymel, 1993) and display greater social helplessness after peer rejection (Gazelle & Drugen, 2009). Greater sensitivity to rejection after a peer setback may hamper an inhibited child’s development of social competen- cies by reinforcing withdrawal from opportunities to build relationships and develop communication skills (Rubin et al., 2018).

Despite this, shy children are just as likely to establish reciprocal friendships as their peers (e.g., Ladd & Burgess, 1999; Rubin et al., 2006). However, shy children have smaller friendship groups (Ladd et al., 2001), form lower‐quality relationships (Rubin et al., 2006), and have mixed success maintaining friendships across time (Ladd et al., 2011; Rubin et al., 2006), likely because reticent social communication limits intimate disclo- sure, an important feature of child and adolescent friendships (Rubin et al., 2006; Schneider, 1999).

Shyness and social reticence are also risk factors for difficulties with school adjustment, including problems with classroom‐based peer relationships and poorer attitudes toward school (Eggum‐Wilkens et al., 2014). In elementary school, shy children are reported by their parents and teachers as experiencing less peer acceptance, and they report disliking school more than non‐shy peers (Eggum‐Wilkens et al., 2014). Studies of school‐aged children have linked shyness with poor academic achievement, as evidenced by lower scores on standardized math and language assess- ments (Vitiello et al., 2012) and by lower vocabulary, verbal fluency, and phonological awareness in kindergarten and first grade (Spere & Evans, 2009). Additionally, shy children participate less in group discussions (Coplan et al., 2004) and take part in fewer one‐on‐one interactions (Evans, 2010). However, teachers rate shy children as being more cooperative and emotionally regulated (Rudasill & Konold, 2008), and less disruptive (Rimm‐Kaufman & Kagan, 2005), further highlighting the multifaceted nature of inhibited children’s interpersonal behaviors.

In summary, shy and socially withdrawn children display enduring social reticence that shapes the develop- ment and quality of peer relationship. Although inhibited children are as likely to form close friendships, inef- fective communication skills and risk of peer rejection may obstruct the development of reciprocal, supportive, and long‐lasting relationships. Moreover, inhibited children exhibit limited engagement and participation in the classroom and struggle to achieve academically relative to more extraverted peers. Further research is needed to examine the longitudinal relationship between inhibition in early childhood and socioemotional function- ing, including the quality of friendships and academic achievement, during adolescence and adulthood.

Psychopathology

The role of BI in the development of psychopathology was recognized early, with investigators proposing links to panic disorder, and subsequently social anxiety disorder (i.e., social phobia) (Rosenbaum et al., 1991). Indeed, BI and anxiety disorders show considerable overlap in phenotypic presentation and course and frequently cooc- cur. Moreover, the patterns of fearful avoidance and anxious withdrawal that characterize BI correspond closely to the clinical presentation of many anxiety disorders (Rapee & Coplan, 2010). These similarities suggest a fundamental continuity between these constructs. However, there is also evidence that BI and anxiety disorders are at least somewhat distinct (Klein & Mumper, 2018; Rapee & Coplan, 2010). For example, despite their fre- quent cooccurrence, the magnitude of the association is only moderate: a considerable number of youth and adults with anxiety disorders do not have a prior history of BI and many behaviorally inhibited children do not develop anxiety disorders (e.g., Hudson et al., 2011).

The fact that BI is evident in infancy or early childhood, generally long before the onset of diagnosable anxiety disorders, suggests that BI may be a precursor or predisposition for later anxiety disorders (Klein & Mumper, 2018). Both precursors and predispositions reflect a developmental sequence in which tempera- ment traits, such as BI, precede the onset of psychopathology (Klein et al., 2011). However, a precursor would reflect a direct connection between BI and at least some forms of anxiety disorder, such that the causal process(es) underlying BI and anxiety are similar, but that BI is a developmentally earlier manifesta- tion of that process. In contrast, a predisposition suggests that BI and anxiety arise from distinct etiological processes, but that individuals with high BI are vulnerable to develop anxiety under certain conditions. That is, other factors are required to moderate the effects of BI in precipitating the onset of psychopathology (Klein & Mumper, 2018).

Prospective Longitudinal Studies

A number of studies have examined the associations between BI in early childhood and subsequent anxiety in later childhood, adolescence, and, more rarely, adulthood. BI has been consistently linked with social anxiety

disorder, particularly when BI has been stable for several years (e.g., Chronos‐Tuscano et al., 2009). In a meta‐analysis, Clauss and Blackford (2012) reported that behaviorally inhibited children showed a 7.5‐fold increase in the odds of developing social anxiety disorder. Approximately 43% of inhibited children exhibited social anxiety disorder by adolescence compared to 12% of uninhibited children. However, the association between BI and social anxi- ety diminished with age and the length of the interval between assessments.

Longitudinal studies have reported that BI also predicts other anxiety disorders, although the magnitude of effects may be smaller than for social anxiety disorder (Sandstrom et al., 2020). Thus, BI predicts subsequent diagnoses of any anxiety disorder (Hudson & Dodd, 2012; Paulus et al., 2015), multiple anxiety disorders (Biederman et al., 1993; Hudson & Dodd, 2012), specific phobia (Paulus et al., 2015), generalized anxiety disor- der (Hudson & Dodd, 2012), separation anxiety disorder (Biederman et al., 1993; Hudson & Dodd, 2012), and panic disorder and agoraphobia (Biederman et al., 1993).

In contrast, the evidence for associations between BI and other forms of psychopathology is much weaker. Caspi and colleagues reported that observers’ ratings of inhibition in three‐year olds predicted depressive dis- orders in early adulthood (Caspi et al., 1996). Other studies, however, have failed to find an association between BI and subsequent depression (Biederman et al., 2001; Muris et al., 2011).

BI appears to be unrelated to, or even protective against, externalizing problems (Bierderman et al., 2001; Muris et al., 2011; Thorell et al., 2004). However, there is some evidence suggesting that reward sensitivity may interact with BI to predict later substance use. For example, Lahat et al. (2012) reported that children with high levels of BI and enhanced striatal responsiveness to rewards had an increased risk of substance use during adolescence.

In summary, longitudinal studies support a developmental sequence of BI as a precursor of later anxiety disorders. However, as noted above, many behaviorally inhibited children do not develop anxiety disorders. This raises the possibility that, consistent with a predisposition perspective, other factors moderate the associa- tion between BI and subsequent anxiety.

Moderators of the BI‐Psychopathology Relationship

Studies have examined several potential moderators, including: (1) neurocognitive factors, such as error moni- toring, executive functioning, and attention biases; (2) parenting style and practices; and (3) life stress.

Neurocognitive Factors

A number of studies have reported that neurocognitive processes moderate the association between BI and subsequent anxiety. Several studies have reported that low levels of attention shifting and high levels of inhibi- tory control in laboratory tasks increase the risk for anxiety symptoms among children with high levels of BI (Thorell et al., 2004; Troller‐Renfree et al., 2019). Moreover, attentional biases toward threat and novelty also appear to moderate the association of BI with anxiety. White et al. (2017) reported that children with BI who reported later anxiety symptoms exhibited attentional biases toward threat or away from positive stimuli. Relatedly, Reeb‐Sutherland et al. (2009) found that children with a history of BI and an increased P300 response to novel stimuli were more likely to develop anxiety symptoms.

Several studies have reported interactions between early BI and the ERN during middle childhood or adoles- cence, such that individuals with BI and a larger ERN – indicating enhanced error monitoring – show an espe- cially high risk for anxiety disorders (Buzzell et al., 2017; McDermott et al., 2009; Meyer et al., 2017), particularly social and generalized anxiety disorders (Lahat et al., 2014). Thus, differences in attentional biases toward potential threat or novelty and performance monitoring appear to be important cognitive processes involved in moderating the progression from BI to anxiety symptoms.

Parenting

A number of studies have examined parenting styles and practices as potential moderators of the association between BI and anxiety disorders (e.g., Kiel & Buss, 2011; Rubin et al., 2002; Williams et al., 2009). As noted

earlier, Rubin and colleagues (2002) proposed that parental overprotection may amplify BI by enabling the child’s withdrawn or avoidant behavior and discouraging independence, thus increasing the risk of develop- ing anxiety symptoms. Hudson and colleagues (2019) found that maternal overinvolvement at age 4 moder- ated the association between BI and anxiety, such that behaviorally inhibited preschoolers reported higher anxiety symptoms at age 12 only when they had overinvolved parents. However, Williams and colleagues (2009) examined BI at 14 and 24 months, self‐reported parenting styles, and internalizing problems at ages 4, 7, and 15 years. They found children with higher BI who also had parents with more permissive parenting styles had the highest reports of internalizing problems at age four but not during subsequent waves of assessments.

Earlier we raised the question of whether some of the variance accounted for by parenting reflects gene‐ environment correlations. This concern is reinforced by findings that parents’ reports of their own BI predict increased risk for anxiety among inhibited children (Stumper et al., 2017).

Life Stress

A substantial body of literature suggests that stress plays a role in the development of anxiety symptoms and disorders (Broeren et al., 2014). Building on this, a handful of studies have explored stress as a moderator of the BI‐anxiety relationship. Brozina and Abela (2006) reported that stress moderated the effects of BI on anxi- ety, such that youth high in BI who experienced stressful life events reported greater anxiety symptoms than their low‐BI counterparts. In contrast, Broeren et al. (2014) and Muris et al. (2011) found that BI and life stress had additive effects on anxiety. A study that assessed links between temperament and anxiety after a natural disaster found that fearfulness in early childhood predicted increased anxiety symptoms among children exposed to high levels of disaster‐related stress several weeks after the event (Kopala‐Sibley et al., 2016; Meyer et al., 2017). More recently, after further follow‐up of that sample, Mumper et al. (2019) reported that the relationship between BI, assessed at age three using both laboratory observation and parent reports, and child‐reported anxiety symptoms in early adolescence was moderated by stressful life events. Moreover, after adjusting for subsequent life stress, exposure to the natural disaster continued to moderate the effects of BI on anxiety symptoms two years later (Mumper et al., 2019). These findings suggest that behaviorally inhibited children may experience greater reactivity to stress or have fewer tools to effectively cope or self‐regulate after stressful life events.

### Conclusion and Future Directions

Longitudinal studies indicate that BI is a moderately stable trait that is associated with a range of outcomes. This chapter selectively reviewed biological, cognitive, and environmental risk factors contributing to the development and maintenance of BI. The literature suggests that both genetic and environmental factors influ- ence BI, which may initially be expressed as high reactivity to novel stimuli in infancy and as fearfulness and reticence in unfamiliar contexts in early childhood. BI appears to be further maintained by maladaptive atten- tion and cognitive processes and environmental influences (e.g., overprotective parenting). Importantly, BI is a significant risk factor for later socioemotional maladjustment and anxiety disorders. However, many children with BI do not develop anxiety disorders, and a number of moderators that influence the outcomes of high BI children have been identified, including neurocognitive factors, parenting practices, and life stress.

Future work is needed in a number of areas to further elucidate the course and consequences of BI across development. First, it is important to understand the heterogeneous manifestations of BI in adulthood, particu- larly the ways in which BI can lead to adaptive qualities in certain contexts. For example, Cain (2013) notes that shy and inhibited individuals may have heightened situational awareness and sensitivity, greater introspection and thoughtfulness, and a proclivity to observe and gather information before acting. In work settings, intro- verted leaders may be more inclined to listen rather than dominate social situations and be more open and receptive to ideas and suggestions, motivating greater productivity.

Second, longitudinal research is needed to elucidate the temporal relationships between BI and its neural and neurocognitive correlates in order to understand etiological and maintenance processes. Third, it is impor- tant to investigate the validity of proposed subtypes of BI and determine if they can explain the multifinality observed in the literature. Fourth, as previously mentioned, adequately powered GWAS studies are critical to understand the nature of the genetic influences in BI.

Fifth, research is needed to disentangle the transactional relationships between BI, peer interactions, and problematic outcomes in developmentally salient contexts (e.g., social media; close friendships and relation- ships; transitions to middle school, high school, and college). Finally, most outcome studies have focused exclu- sively on anxiety symptoms, hence less is known about the relationship between BI and other internalizing disorders, such as depression, and externalizing psychopathology. Further investigation of BI as a risk or protec- tive etiological factor may have implications for developing more effective prevention and early intervention programs.

Solitary Activities from Early Childhood to Adolescence: Causes, Content, and Consequences

In a crowded and noisy preschool classroom during morning free play, a young girl sits alone in the corner, intently focused on building a tower with colorful blocks; on the playground at recess in elementary school, a child in grade four stands apart from his classmates, watching them play a boisterous game of tag, without joining in; and alone in her room, an adolescent closes her eyes and lets her mind wander as she listens to music. As is evident from these brief vignettes, experiences of solitude are varied and complex. Indeed, chil- dren and adolescents may spend time alone for many different reasons and engage in many different types of solitary activities, Moreover, the causes and content of these solitary activities appear to be important determi- nants of the consequences of solitude.

Although the family and the peer group are unique and critically important contexts for children’s develop- ment (Bukowski et al., 2018; Grusec & Hastings, 2015), it is also important to consider the implications of their time away from parents and friends (Coplan, 2011). In this chapter, we focus on the putative causes and conse- quences of solitary activities in childhood and adolescence. In this regard, we consider two broad perspectives that differ in their conceptual and methodological approaches. The first is derived from naturalistic observa- tions of children’s nonsocial play activities in peer contexts (e.g., childcare centers, elementary schools, labora- tory play rooms). The majority of this work has focused on younger children, but some recent studies of older children and adolescents have also emerged. The second perspective relies upon self‐ and parent‐reports of youths’ time spent alone outside of school, which has primarily focused on older children and adolescents.

Both of these approaches highlight the notion that solitary activities can have both costs and benefits from early childhood to adolescence. For example, some developmental psychology researchers have long postu- lated that we should be concerned about the socioemotional functioning of socially withdrawn children, who tend to remove themselves from opportunities for peer interaction (Lowenstein & Svendsen, 1938; Rubin, 1982). In contrast, others have proposed that certain types of solitary activities can serve particularly important devel- opmental needs for young children (e.g., Katz & Buchholz, 1999; Moore et al., 1974) and adolescents (Larson, 1990, 1997). These competing streams of theory and research highlight the complex – and sometimes paradoxical – links between solitude and well‐being across the life span (Coplan et al., 2018).

As we will argue in this chapter, solitary activities are heterogenous. In this regard, it has become clear that we must move beyond simplistic questions pertaining to the correlates of *how much* children and adolescents spend time alone and instead ascertain the potential implications of *how* they spend their time alone.

Nonsocial Play in Peer Contexts

Herein, we use the term *nonsocial play* to specifically denote the display of solitary activities and behaviors in the presence of other potential play partners (Coplan, Ooi, Kirkpatrick et al., 2015). Accordingly, nonsocial play is context dependent, pertaining to engagement in solitary activities despite immediately available opportuni- ties for peer interaction. In this regard, we are not referring to a child playing quietly alone in their room at home. We have also focused our empirical review primarily on studies that have employed observational meth- odologies, although some parent‐ and teacher‐rated assessments have also been developed to specifically assess subtypes of nonsocial play (e.g., Coplan & Rubin, 1998; Fantuzzo et al., 1998; Hart et al., 2000).

The study of nonsocial play at school has a long and rich history (see Coplan, 2011, for a review). Of par- ticular influence was Parten’s (1932) taxonomy of social participation, which included several different non- social behaviors (e.g., onlooking, unoccupied behavior, solitary play). From a more structural perspective, Piaget (1962) and Smilansky (1968) described a linear progression of children’s play forms from functional/ sensorimotor activities in infancy, through constructive play and object exploration in toddlerhood and early childhood, to the eventual emergence of symbolic/dramatic play. The synthesis of these two perspectives helped establish the contemporary framework for distinguishing among subtypes of nonsocial play (Coplan et al., 1994; Rubin, 1982). There has been considerable research into the meaning and implications of differ- ent forms of nonsocial play, particularly in early childhood. In the following sections, we describe the three forms of nonsocial play that have received the most attention in the extant literature, with a particular focus on their underlying psychological meanings and potential implications for children’s social, emotional, and cognitive development.

*Reticent behavior. Reticent* behavior consists of onlooking (e.g., watching other children without joining in) and unoccupied behavior (e.g., staring off into space, wandering around aimlessly) (Coplan et al., 1994). For most children, reticent behavior serves as part of a developmentally normative “bridge” between playing alone and playing with others. This transitional pathway proceeds from watching others play (i.e., onlooking), to playing next to – but not with – other children (i.e., parallel play), to social engagement (i.e., group play and peer conversation) (Robinson et al., 2003). In this regard, it is not surprising that this type of behavior is quite common in early childhood, observed to occur between 17–20% of the time during free play among unfamiliar peers (Coplan et al., 1994; Nelson et al., 2005) and between 9–24% of the time during free play with familiar classmates at preschool or kindergarten (Coplan, Gavinski-Molina, et al., 2001; Gal‐Szabo et al., 2019; Gornik et al., 2018). Notably, there do not appear to be gender differences in terms of observed frequencies of reticent behavior in early childhood (e.g., Coplan, Gavinski-Molina, et al., 2001; Gal‐Szabo et al., 2019).

However, some children are not able to proceed beyond the initial “watching” stage. From a motivational perspective, reticent behavior is conceptualized as a behavioral indicator of an *approach‐avoidance conflict* in social contexts (Coplan et al., 2004), wherein a child simultaneously desires (i.e., high social approach motiva- tion) and fears (i.e., high social avoidance motivation) initiating social interactions (Asendorpf, 1990). Thus, the frequent display of reticent behavior among peers is thought to reflect a child “trapped” in this conflict due to social fear and anxiety. In support of this conceptualization, various fearful temperamental characteristics have been found to be associated with both concurrent and subsequent observed reticent behavior among young children. For instance, increased reticent behavior in early childhood has been linked to shyness (as rated by parents; e.g., Coplan et al., 1994; Spinrad et al., 2004), behavioral inhibition (e.g., Smith et al., 2019), dysregu- lated fear (Kiel & Buss, 2014), as well as lower positive emotionality and higher negative emotionality (Gornik et al., 2018). Reticent behavior has also been found to be more common among children identified as anxious and inhibited based on parent and teacher ratings (e.g., Coplan et al., 2008; Henderson et al., 2004; Rentzou, 2013), observed anxious behaviors (e.g., hair pulling, digit sucking, crying; Coplan et al., 1994; Coplan et al., 2004), and indices of physiological arousal known to be associated with anxiety, including greater right‐frontal EEG asymmetries (Henderson et al., 2004) and elevated cortisol levels (Perez‐Edgar et al., 2008).

The frequent display of reticent behavior appears to carry with it some negative consequences in the peer group. Even in early childhood, peers seem to respond to this form of nonsocial play with rejection and

exclusion (e.g., Coplan et al., 2008; Nelson et al., 2008). For example, Chen et al. (2006) observed quartets of previously unfamiliar four‐year‐olds during unstructured free play in a laboratory playroom. Peers were more likely to directly respond to reticent behavior with acts of social rejection (e.g., overt refusal, disagree- ment) and less likely to respond with positive social behaviors (e.g., approval, cooperation). Perhaps as a result, reticent behavior has also been associated with negative self‐perceptions in childhood (e.g., Nelson et al., 2005). It could be that peers respond negatively to this type of play because children who frequently engage in reticent behavior are less socially skilled (Gal‐Szabo et al., 2019), and/or because it is perceived as nonnormative and therefore undesirable (Bowker et al., 2020). This may be particularly applicable to boys, as nonsocial behaviors in the peer group violate gender norms related to male social assertion and dominance (Doey et al., 2014). In support of this, reticent behavior has been found to be more strongly related to peer rejection for boys than for girls (Hart et al., 2000; Nelson et al., 2005).

Early signs of peer adversity are concerning as they are robustly associated with school adjustment difficul- ties in early childhood (Bukowski et al., 2018). Indeed, these negative peer experiences may help to account for negative associations between the display of reticent behavior and indices of academic adjustment (e.g., Coplan et al., 1994; Coplan, Gavinski-Molina et al., 2001), such as language skills (Holmes et al., 2019) and creativity (Holmes et al., 2015). In another study, observed reticent behavior in kindergarten was also found to be associ- ated with less close teacher–child relationships, lower teacher ratings of child academic skills, and more nega- tive child‐reported perceptions of academic competence and school liking (Coplan et al., 2008).

Thus, children who most frequently display this form of nonsocial play appear to be in solitude because they are too shy and socially anxious to initiate and maintain peer interactions, which places them at increased risk for socioemotional maladjustment. However, it is important to note that children who frequently engage in reticent behavior likely make up a heterogeneous group, representing different trajectories in their nonsocial behaviors, which, in turn, may have implications for adjustment (Degnan et al., 2014). Moreover, for many children, aspects of reticent behavior may serve an adaptive function by allowing for a more gradual transition from solitary to peer group activities (Robinson et al., 2003).

*Solitary‐active behaviors. Solitary‐active* play is a term used to describe the display of solitary‐functional and solitary‐dramatic behaviors in the presence of peers (Rubin, 1982). Solitary*‐*functional behavior is characterized by repetitive sensorimotor actions, either with or without objects (e.g., skipping, banging blocks together) (Coplan et al., 1994; Rubin, 1982). Solitary*‐*dramatic behavior (sometimes also referred to as solitary‐pretend), on the other hand, involves engagement in pretense while playing alone (e.g., playing make believe). Solitary‐ active behavior is the least frequently displayed form of solitary play in early childhood, observed to occur only 2–3% of the time during indoor free play with familiar and unfamiliar peers (Coplan et al., 1994; Coplan, Gavinski-Molina et al., 2001). Indeed, this type of nonsocial behavior does not appear to be developmentally normative, with only a small proportion of children typically observed to engage in this type of behavior frequently (Coplan, Wichmann et al., 2001).

It has been suggested that increased rates of repetitive sensorimotor actions (i.e., solitary‐functional behav- iors) reflect an attempt to compensate for motor skills deficits by allowing the child to practice simple motor actions more frequently (Bar‐Haim & Bart, 2006). It has also been argued that solitary‐active play in early child- hood may be a behavioral marker for impulsivity and social immaturity (Coplan et al., 1994; Rubin, 1982). For example, children who most frequently display solitary‐active play tend to be rated by parents and teachers as more emotionally dysregulated, hyperactive, distractible, and less attentive (Coplan, Gavinski-Molina et al., 2001; Rentzou, 2013), and have also been observed to be more behaviorally disruptive and off‐task when asked to complete cooperative tasks (Coplan et al., 1994). Children who most frequently engage in solitary‐ active play are also rated by teachers as displaying more adjustment problems and tend to have poorer academic skills and attitudes toward school (Coplan, Wichmann et al., 2001; Evans et al., 2012; Nelson et al., 2008).

Accordingly, it is perhaps not surprising that, despite its low frequency of occurrence, solitary‐active play appears to evoke negative responses from peers, including rejection (Evans et al., 2012; Rubin, 1982). Thus, solitary‐active play may be reflective of a child playing alone predominantly because other children do not want to play with them due to their immature behaviors (Rubin & Mills, 1988). It is also possible that

solitary‐active children’s inability to engage in successful social interactions with peers may lead them to further retreat into solitude in response to the isolation.

In addition to externalizing and peer difficulties, children who frequently engage in solitary‐active play are also more likely to demonstrate internalizing problems (Coplan, Gavinski-Molina et al., 2001). However, girls who engage in solitary‐active behaviors may be particularly at risk for maladjustment. For example, some work has found that girls who engaged in the most solitary‐active play displayed more behavior problems (i.e., anxi- ety, aggression) than their comparison peers (Coplan, Gavinski-Molina et al., 2001). These authors speculated that because of their boisterous and “active” qualities, solitary‐active behaviors displayed by girls as compared to boys may be met with more negative responses as they are viewed as violating gender norms. There is also some evidence to suggest that solitary‐active play is more strongly related to relational aggression among girls and physical aggression among boys (Nelson et al., 2012).

As a final note, it appears that *context* is particularly important in considering the meaning and implications of solitary‐active play. For example, whereas the display of solitary‐dramatic play might raise a “warning flag” when viewed in a crowded preschool playroom, it might be a common and normative behavior when alone (e.g., a child playing with dolls in their room) (Coplan, Wichmann et al., 2001). Similarly, solitary‐active play tends to occur more frequently during free play on the playground as compared to indoors (Bar‐Haim & Bart, 2006; Nelson et al., 2008), possibly because outdoor activities offer more opportunities to engage in soli- tary‐functional–type activities (e.g., running, swinging, sliding) (Spinrad et al., 2004). As such, in this context, solitary‐active behavior may be more appropriate and thus not expected to be associated with maladaptive outcomes (Bar‐Haim & Bart, 2006; Spinrad et al., 2004). In support of this notion, solitary‐dramatic play (but not solitary‐functional play) on the playground has been found to be associated with indices of maladjustment, including impulsivity, immaturity, and aggression (Nelson et al., 2008). These finding raise two important cave- ats about our understanding of this form of nonsocial play: (1) the implications of solitary‐active play may differ across contexts (i.e., playroom vs. playground); and (2) some of the components that comprise solitary‐active behaviors may be more problematic (i.e., solitary‐dramatic play) than others (i.e., solitary‐functional play).

*Solitary‐passive behaviors. Solitary*‐*passive* play is used to describe solitary‐constructive and solitary‐exploratory activities (Coplan et al., 1994; Rubin, 1982). Solitary‐constructive play includes the manipulation of objects for the purposes of creating something (e.g., building with blocks, doing a puzzle), whereas solitary‐exploratory behavior involves the examination and/or manipulation of objects for the purposes of gaining information (i.e., “how does this object function?”) (Rubin, 1982). Solitary‐passive behavior is considered to be the most normative and common form of nonsocial play in early childhood, observed to occur between 20–45% of the time during indoor free play (Coplan, 2011; Coplan, Gavinski-Molina et al., 2001; Nelson, Rubin, & Fox, 2005), although less frequently on the playground (Nelson et al., 2008).

It had been previously suggested that solitary‐passive play might be indicative of a non‐fearful preference for solitude (Rubin & Asendorpf, 1993). However, more recent research indicates that solitary‐passive play does not appear to share a “one to one correspondence” with a specific set of psychological characteristics. To begin, there is some evidence to suggest that solitary‐passive behaviors may serve some adaptive functions for young children. Indeed, solitary play in the context of the early childhood classroom has been specifically described as a “necessity” (Katz & Buchholz, 1999), and the goal‐directed nature of solitary‐passive play makes it education- ally valued at preschool (Moore et al., 1974). For example, the constructive component of solitary‐passive play (e.g., manipulating materials) is thought to contribute to children’s learning about spatial concepts, propor- tions, and mathematics (Ness & Farenga, 2007). Accordingly, this form of nonsocial play may be preferred or even encouraged by teachers (Rubin, 1982). Consistent with this notion, teachers rated solitary‐passive behav- iors as less concerning than reticent and aggressive behaviors on the playground (Nelson & Evans‐Stout, 2019). In further support of this “positive and normative” characterization, observed solitary‐passive play has been linked with: (1) parental ratings of temperamental attention and emotional regulation (i.e., lower levels of negative emotionality, ease in soothing); and (2) observations of task persistence and skill in object‐oriented tasks (e.g., Coplan, Gavinski-Molina et al., 2001; Rubin et al., 1995). Similarly, results from several studies have

indicated that this form of nonsocial play is largely unrelated to indices of psychosocial maladjustment in early childhood (e.g., Bar‐Haim & Bart, 2006; Nelson et al., 2008).

Although such findings are consistent with a conceptualization of solitary‐passive behavior as a com- paratively benign form of solitude, other findings suggest that children may engage in solitary‐passive play for less adaptive reasons. For example, it has been argued that shy children may engage in solitary‐passive behavior as a coping strategy in the face of feelings of social unease (Henderson et al., 2004). In support of this, parent‐rated solitary‐passive play was found to be positively associated with teacher‐rated anxious and fearful behaviors in a sample of preschoolers (Rentzou, 2013). Solitary‐passive play (along with reticent behavior and solitary‐active play) was also recently found to be negatively associated with indices of lan- guage capacity (e.g., total utterances, total words, use of unique words) (Clifford et al., in press). Other researchers have reported associations between solitary‐passive play and negative peer responses (Coplan et al., 2007; Evans et al., 2012; Nelson et al., 2005; Zava et al., 2020). In this regard, it can be further specu- lated that some children are also retreating to solitary‐passive play because they are being actively excluded by peers (Rubin & Mills, 1988). Moreover, in contrast to solitary‐active play, boys who frequently engage in solitary‐passive behaviors appear to be at greater risk for internalizing, social (e.g., lower social compe- tence, peer rejection), and academic difficulties as compared to girls (Coplan, Gavinski-Molina et al., 2001; Hart et al., 2000; Nelson et al., 2005). This may be another example of socially withdrawn behaviors violat- ing gender stereotypic norms for boys (Doey et al., 2014).

Thus, although the display of this form of nonsocial behavior in the peer group is quite normative (and may in fact serve adaptive functions), children who most frequently engage in solitary‐passive play may still warrant our attention going forward. Regardless of the reasons why they play alone, young children who frequently refrain from socially engaging with peers may be at risk for poorer adaptation in the peer group (e.g., lower peer preference, social skills; Vaughn et al., 2016). Furthermore, children who spend relatively more time alone may “miss out” on the unique benefits of the peer group, and in later childhood, could come to lag behind in the acquisition and implementation of important socioemotional and cognitive skills (Rubin et al., 2009).

*Solitary activities among older children and adolescents.* The vast majority of research on nonsocial play has focused on young children (Coplan, 2011). This is likely because the frequency of such behaviors decreases as children get older (e.g., Nelson et al., 2005), with some nonsocial behaviors (e.g., solitary‐active) not observed at all among older children. Indeed, by late childhood and early adolescence, observed nonsocial play in the presence of peers is rare, accounting for less than 10% of behaviors in the schoolyard (Coplan, Ooi, & Rose-Krasnor, 2015; Coplan et al., 2013). Additionally, only a small proportion of youth engage in nonsocial behavior with any frequency (Coplan, Ooi, & Rose-Krasnor, 2015). Not surprisingly, as expectations for frequency and quality of peer interactions rise (Rubin et al.,, 2009), the majority of older children’s free time in the schoolyard is spent engaged in group peer interaction (Coplan, Ooi, & Rose-Krasnor, 2015). As such, all forms of solitary activities may come to be viewed by peers as increasingly “deviant” in middle or later childhood, and thus more likely to elicit negative peer responses such as rejection and exclusion (Coplan et al., 2019).

Few empirical studies have included observations of solitary play beyond the preschool years (e.g., Blatchford et al., 2003; Coplan, Ooi, & Rose-Krasnor, 2015; Coplan et al., 2013; Nelson et al., 2005; Gazelle, 2008; Spangler & Gazelle, 2009). Notwithstanding, there is at least some preliminary evidence to suggest that older peers respond negatively to all forms of nonsocial play. For example, in a sample of children in grade three (age eight to nine years), both reticent behavior and solitary‐passive play were found to be positively associ- ated with peer ratings of exclusion, rejection, and victimization (Gazelle, 2008). Similarly, in a sample of children in grades four through six (age 10–13 years), observed reticent behavior and solitary play were associ- ated with more negative perceptions of peer relations and higher self‐reported loneliness (Coplan et al., 2013). There was also evidence indicating potential risk for emotional difficulties, as observed nonsocial behavior was found to be positively associated with social anxiety, depressive attributional styles, depressive symptoms, and lower positive affect.

Coplan, Ooi, and Rose-Krasnor (2015) observed reticent, solitary play, dyadic interaction, and group interac- tion behaviors in the schoolyard in a sample of 10‐to‐13‐year‐olds. Using cluster analysis, the authors identified four groups of children based on the observed play behavior frequencies: group‐social, average, dyadic, and nonsocial. The nonsocial group displayed significantly higher frequencies of reticent and solitary play, and sig- nificantly lower group interaction than all the other groups. Children in the nonsocial group reported the most peer difficulties, highest loneliness, and lowest perceived peer relations of all four groups. Additionally, children in the nonsocial group self‐reported the highest levels of social anxiety and depressive symptoms, and were rated by mothers as having more emotional difficulties than those in the group‐social and average groups. Based on these findings, the authors argued that being alone in the schoolyard may serve as a marker for soci- oemotional maladjustment.

Nevertheless, further research is required to better elucidate the potentially complex links between nonso- cial play and indices of socioemotional functioning beyond the early childhood years. For instance, although solitary behaviors (in general) are expected to garner negative responses from others in later childhood (Coplan et al., 2019), there is evidence to suggest that there is heterogeneity in the accompanying behaviors (Gazelle & Shell, 2017) and trajectories (Gazelle & Faldowski, 2019) of nonsocial older children. Moreover, these appear to be important factors in understanding the potential implications of nonsocial behavior. For instance, Gazelle and Shell (2017) identified different types of anxious‐solitude (assessed as a combination of shy, reticent, and onlooking behaviors) in a sample of children in grades three through five, and found that some anxious‐solitary children (i.e., who were also high in agreeableness) were better adjusted than others (e.g., who were also high in attention‐seeking). Most recently, Gazelle and Faldowski (2019) longitudinally assessed anxious solitude in a sample of children in grades three to seven and found that only those with increasing anxious‐solitary behav- iors were more prone to symptoms of social anxiety and depression. Thus, the links between nonsocial behav- iors and adjustment outcomes in older childhood and adolescence remain complex. Indeed, peers may become increasing tolerant and accepting of solitude in later adolescence, perhaps reducing the negative implications of nonsocial behaviors over time (see Bowker, White, & Etkin, Chapter 10).

Solitary Activities Outside of School

Despite the rich history of research on young children’s solitary activities at school, on the playground, and in the laboratory playroom, there is a notable paucity of research related to how children spend their time alone in other contexts. Results from the few empirical studies suggest a rising trajectory of time spent alone starting at about 10% of waking hours in early childhood (Archbell et al., 2020). This infrequency of alone time is likely attributed to basic issues pertaining to the care and safety of young children. Indeed, this proportion increases to about 20% in middle and late childhood, to over 33% during adolescence (Larson & Csikszentmihalyi, 1980; Larson et al., 1982; Larson & Richards, 1991).

Adolescents clearly have greater freedom over how they spend their time compared to younger children – and would typically be expected to be able to *choose* to spend time by themselves. Moreover, from a developmental perspective, adolescents are well prepared to take advantage of this increased autonomy during time alone. Indeed, it has been theorized that solitude can be a particularly constructive domain for adolescents (Coplan et al., 2019; Larson, 1990, 1997; Goossens, 2014; see also Bowker, White, & Etkin, Chapter 10). Specifically, it has been speculated that solitude facilitates critical developmental tasks, including identity and autonomy development, as well as affording opportunities for creative and leisure interests. For example, most late adoles- cents (17–19 years) recognize that solitude can be a time for quiet reflection, where the removal of social pres- sures allows freedom to engage in a wide variety of activities on one’s own (Corsano et al., 2006). Thus, in contrast to how we conceptualize nonsocial play in early childhood, solitary activities in adolescence seem to take on a greater variety of forms and functions.

Although not specific to solitude, insights from leisure studies provide a useful starting point for develop- ing a cohesive conceptual framework of activities. Prior to the widespread adoption of the internet and smart devices, researchers had conceptually organized adolescents’ time use into three categories (Kleiber et al., 1986). *Productive* included externally imposed activities, such as occupational work or homework.

M*aintenance* represented day‐to‐day routine activities, such as driving, self‐care, and chores. Finally, *leisure* represented activities sought out intrinsically and for enjoyment, such as hobbies, art, and exercise, but also more sedentary behaviors like watching TV. The researchers postulated that engaging in leisure activities is particularly important for staving off boredom and promoting well‐being. Larson (1990, 1995, 1997) extended these thoughts into the realm of solitude, suggesting that solitude is beneficial in adolescence because it affords opportunities to engage in leisure. For instance, it has been suggested that adolescents value solitude because it gives them the opportunity to use media (e.g., listening to music) and cultivate their own sense of private self (Larson, 1995).

Despite the theorized link with solitude (Larson, 1990, 1997), Kleiber et al.’s (1986) activity categories were never specifically examined in this context. Although leisure research has transitioned into a stronger focus on adolescents’ sedentary versus non‐sedentary leisure (e.g., Ferrar et al., 2013), a handful of studies started inves- tigating a wider variety of ways that adolescents spend their time (e.g., Hofferth & Sandberg, 2001; McHale et al., 2001). In one of the few studies to specifically explore *solitary* activities, Ruiz‐Casares (2012) interviewed ten‐ to seventeen‐year‐olds about what they do when they are home alone and whether they feel lonely during that time. Children and adolescents commonly reported watching TV, playing video games, communicating over the internet, and doing homework. There were no age differences in the types of solitary activities, but younger adolescents (12–13 years) and older adolescents (17 years) reported feeling lonelier than those in the middle of these two periods. Further interviews with these adolescents revealed a striking range of attitudes toward being home alone, with some relishing the increased sense of autonomy and yet others feeling lonely or even frightened. Some adolescents reported engaging in activities such as browsing the internet or chatting with friends online to distract themselves from feeling lonely. Still others found themselves incapable of engag- ing in any activities whatsoever because being home alone made them feel empty and lonely.

Some of these more worrisome reports are epitomized by the term *latchkey* children, describing youth who often come home to empty houses and are forced to fend for themselves with sparse parental supervision (Steinberg, 1986). But also suggested in these interviews is a dynamic nature of solitude in adolescence – that *how* adolescents spend their time alone is intimately linked to their experience of time alone. Nevertheless, because Ruiz‐Casares (2012) focused exclusively on instances in which children and adolescents were home alone, the results do not extrapolate to all instances of solitude, which include being in one’s room even if fam- ily members happen to be in the house.

Extending this line of research further, Hipson et al. (in press) recently asked high school students (16–18 years of age) to report the frequency of their time spent alone during the last week – and also specifically *how* they spent this time. In contrast to earlier studies, the researchers used a broader categorization of solitary activities, including not only *behavioral* activities (e.g., hobbies, exercise, watching TV), but also *cognitive* activities, such as planning, reflecting, and ruminating. This distinction, although not perfectly clear‐cut, fits with emerging social psychological literature contrasting people’s enjoyment of “doing” versus “thinking” when they are alone (Buttrick et al., 2018; Nguyen et al., 2018; Wilson et al., 2014). Results from model‐based clustering tech- niques revealed three distinct groups of adolescents based on their most common solitary activities. The largest of these groups, labeled the *passive media* group, spent most of their time alone watching TV or videos. In contrast, the *engaged* group spent their time alone in more diverse ways, including using interactive technology as well as hobbies, homework, and listening to music. A third group, labeled *unoccupied,* spent their time alone engaged exclusively in cognitive pursuits such as daydreaming, planning, and rumination. Interestingly, this latter group of adolescents reported spending the least amount of time alone, and spent this time thinking instead of doing particular activities.

Hipson et al. (in press) also investigated links between membership in these solitary activities groups and indices of well‐being. Adolescents in the passive media group reported the highest negative affect, which could be interpreted as reflecting the proposed benefits of spending time alone constructively. Furthermore, adoles- cents in the unoccupied group reported the highest rate of loneliness of the three groups, suggesting that *qual- ity* of time alone may be more indicative of loneliness than quantity of time alone. Some caution is warranted in interpreting these correlational results too strongly, as it is equally probable that adolescents who experience less negative affect are more likely to spend their time in solitude constructively. Despite these limitations, this

recent research provides us with a clearer picture of the heterogeneity of solitary activities among adolescents and offers a deeper understanding of how both the *quantity* and *quality* of time spent alone influence potential outcomes of solitude. Taken together, there is remarkable variation in how adolescents spend their time alone. On average, much of this time is spent on screens, but we clearly see too that some adolescents use this time in ways directly related to identity exploration and development.

Conclusions and Future Directions: Considering Contexts

In this chapter we have presented *solitary activities* in childhood and adolescence as multidimensional constructs. Accordingly, we would argue that parents, teachers, and psychologists should not use the broad and undifferenti- ated construct of “being alone” (both in and out of school) as a singular index of well‐being or indicator of risk. Indeed, there is converging evidence to suggest that different structural forms of solitary activities are associated with decidedly different socioemotional outcomes across these developmental periods. Notwithstanding, there is still much work to be done. In this concluding section, we briefly offer some directions for future research, focused on the consideration of additional aspects of the *context* of solitary activities.

First, the majority of studies reviewed in this chapter have been conducted with samples from Western cul- tures. However, recent years have witnessed increased attention to the study of childhood solitude in Asian and other non‐Western cultures (see Chen & Liu, Chapter 6). There is some evidence to suggest that solitary activi- ties may be viewed differently across cultures (Chen, 2019; Choo, Xu, & Haron, 2012; Ding et al., 2015). For example, in one study, quartets of seven‐year‐old children in China and Canada were observed interacting dur- ing play with a single attractive toy (French et al., 2011). Among the results, passive and reticent behaviors in the Chinese sample (but not the Canadian sample) were positively associated with peer liking. However, among older Chinese children, there is emerging evidence that the display of any form of solitary behaviors in the peer group context evokes negative social responses (Coplan et al., 2016; Liu et al., 2014; Zhu et al., 2018). It has been argued that children who choose to remove themselves from the peer group are perceived as selfish and socially deviant because they are violating cultural norms regarding collectivism and social harmony (Chen, 2019). Future research is needed to further explore the meaning and implications of solitary behaviors across a wider range of cultural contexts.

Second, the ubiquitous nature of screens and other forms of digital technologies have the potential to com- pletely reshape our conceptualization (and perhaps the very existence) of solitude (Coplan et al., 2018). There is continued debate as to implications of screens for child and adolescent development (see Odgers & Jensens, 2020 for a recent review). With regard to solitary activities, there is now a (pressing) need to integrate screen time into our conceptual models. For example, if children are physically alone but virtually communi- cating with others (e.g., via instant messaging or face‐to‐face), does this constitute a solitary activity? There may be reason to consider some activities as *less* solitary than others, inviting the notion of solitude as a spec- trum. As well, certain forms of technology may have specific functions in solitude (Nelson et al., 2016). For example, there is evidence to suggest that using a tablet in solitude might be a particularly effective form of momentary stress relief (Leung, 2015). These considerations will become increasingly pressing as immersive forms of communicative technology find their way into the hands of children and youth (see also Burnell, Underwood, & George, Chapter 18; Kim, Chapter 17).

Finally, there is considerable future work to be done in terms of exploring the meaning and implications of solitary activities across the life span. As is evident from the content of this chapter, most of the empiri- cal research specifically assessing the content of solitary‐activities has been conducted in samples of young children. Coplan et al. (2019) proposed a model of developmental timing effects that describe differential implications of seeking to spend time alone at different age periods. For example, solitary activities are described as more adaptive in early childhood (when social play is less common), becoming increasingly maladaptive across the childhood years (rising expectations/norms for social interactions and conformity), but becoming more adaptive again during the latter part of adolescence (increased need for privacy, more positive attitudes toward solitude). Thus, the implications of spending time alone may vary considerably across the life span. Future research is required to further evaluate this model specifically with respect to

different solitary activities, and to extend it beyond early adulthood (see Nelson & Millet, Chapter 11; Hoppmann et al., Chapter 13).

To conclude, it seems clear that not all forms of solitary play are created equal. Increased understanding of various mitigating factors (e.g., age, technology, context, culture) will likely continue to reveal even more nuanced differences in how children experience solitude and how peers respond to different nonsocial behaviors. For now, we would argue that although it is of continued interest to explore the implications of *how much* children spend time alone, it is perhaps even more important to consider *how* children spend their time alone.

Manifestations of Solitude in Interpersonal Contexts and Negative Peer Experiences: Peer Rejection, Exclusion, and Victimization

Since early in the last century, developmental scientists have regarded the peer culture as an important social- izing context for children’s development, and have endeavored to understand why some children fare less well in this milieu than others do.\* As early as the 1930s, concerns were expressed about children who lacked the “social effectiveness” to “take their place” in social groups and become accepted by their associates (Koch, 1933). One nascent hypothesis was that children who were “least acceptable” to their peers had personality character- istics that caused them to become “outsiders” (Northway, 1944). Investigation of this hypothesis suggested that children with three personality types, labeled “recessive,” “socially uninterested,” and “socially ineffective,” were likely to have peer difficulties.

Contemporary researchers remain interested in elucidating child characteristics that are associated with peer difficulties and it is perhaps not coincidental that the personality types described by early investigators corre- spond, albeit imperfectly, to some of the child characteristics that today’s investigators have targeted. Solitary children, including those who might be considered “recessive” (e.g., shy, reticent) or “socially uninterested” (e.g., unsociable), have garnered considerable research attention over the last several decades, and their behav- iors have been construed as potential causes and consequences of peer difficulties.

Two principal agendas that researchers have pursued in recent years include explicating the causes of solitary behavior – including the bases for distinct forms or subtypes – and elucidating its developmental consequences. These agendas are rooted in scientists’ desire to understand why children are (or become) solitary, and whether the expression of solitary behavior – particularly when manifested in contexts that call for social engagement (e.g., classrooms) – creates specific costs or benefits for the individual’s development.

In this chapter, we examine evidence that reflects upon the latter of these two agendas, that is, the associa- tion between solitary behavior and specific features of children’s development. The focal point for our analysis is the link between solitary behavior and three types of negative peer experiences: peer rejection, peer exclu- sion, and peer victimization. Evidence suggests that solitary children are at risk for negative peer experiences, although the nature, timing, and severity of such experiences appears to vary depending on the motivations that underlie children’s manifestations of solitude (i.e., vary by solitary subtypes). Less is known, however,

about *how* these associations develop – that is, the processes through which negative peer experiences come to be associated with solitary propensities. Although most of the research conducted thus far has been predicated upon the hypothesis that solitary behavior (depending on the basis for its manifestation) precipitates negative peer experiences, the opposing direction of effect is also plausible. That is, it is conceivable that negative peer experiences drive solitary behavior (e.g., see Ren et al., 2016; Wesselmann et al., Chapter 15). Also plausible is the possibility that children’s solitary behavior and negative peer experiences mutually influence each other over time, in ways that are consistent with person by environment, or transactional models of development.

In the pages that follow, our aims are to assess current knowledge about solitude’s associations with negative peer experiences and, to the extent possible, shed light on the processes that may link these variables. One goal, therefore, is to gain insight into the conditions under which solitary children experience, or are exposed to negative peer experiences. Here, we are interested in the extent to which available evidence reveals which types of solitary children are likely to have negative peer experiences and, if so, when in the course of their develop- ment is such treatment likely. Another objective is to determine whether the results of existing longitudinal (predictive) studies offer insight into specific process hypotheses – that is, the likelihood that solitary behavior precipitates negative peer experiences or the reverse, or whether the observed predictive relations better fit person by environment, or transactional models of development.

Prior to addressing these objectives, we review the constructs of solitude and negative peer experiences, identify common or established exemplars, and summarize the conceptual distinctions that researchers have made among these variables (i.e., subtypes of solitary behavior; types of negative peer experiences/relations).

### The Construct of So1itude and Identification of So1itary Subtypes

Within current theoretical perspectives, the pursuit of solitude within interpersonal contexts – also referred to as social withdrawal – primarily is construed as arising from motivational or emotional states that exist within the child. Included among these are the child’s desires to seek or avoid social contact or interaction (i.e., approach, avoidance motivation; see Asendorpf, 1990), and emotional states or reactions that support or inhibit such motivations (e.g., fearfulness or lack of fearfulness; fear of social novelty or social evaluative concerns; see Coplan et al., 2013). It is often assumed that these states stem from preexisting organismic factors (e.g., child’s temperament) and early rearing experiences (e.g., insecure parent–child attachment), but it is also plausible that they are instilled or aroused in the child by specific environmental experiences (e.g., positive or negative peer experiences).

The diversity of motives and emotions that are hypothesized to underlie solitary propensities have enabled researchers to envision different “reasons,” or combinations of internal causes, that may not only be responsi- ble for children’s solitary behavior, but also account for differences in how children manifest solitude. These conceptions have been instrumental in the creation of person‐oriented taxonomies – that is, the specification of solitary subtypes.

Although efforts to distinguish among solitary children are ongoing, and have produced some concep- tual and terminological disparities, the subtypes that have been proposed and investigated most consist- ently are: *shy, unsociable, and socially avoidant* (see Asendorpf, 1990, 1993; Coplan et al., 2013). Children who are shy, or alternatively referred to as anxious‐solitary, are characterized as having conflicted motiva- tions about social contact (i.e., high social approach/high social avoidance; see Asendorpf, 1990, 1993). Shy children desire to affiliate with peers (i.e., approach) but they also feel fearful or anxious about social contact and thus, are inclined to avoid it. Unsociable children, in contrast, have been characterized as hav- ing low approach and low avoidance motivations, suggesting that they are relatively disinterested in affili- ation (i.e., they prefer solitude) but are not driven by fear or anxiety to avoid social contact. Children deemed socially avoidant, as a solitary subtype, are those who possess low social approach and high social avoidance motivations. It is postulated that these children not only prefer solitude (i.e., lack the desire to affiliate) but, like shy children, also fear social contact and thus actively seek to avoid it (Coplan et al., 2018).

### The Concept of Negative Peer Experiences and Corresponding Re1ationa1 Forms

Characterizing the nature of peer experiences became an important conceptual and measurement objective when investigators began to study children’s social difficulties and probe agemates’ contributions to their socialization and development. It was postulated that peers could have beneficial (i.e., positive) as well as adverse (i.e., negative) effects on children’s development, and thus investigators have sought to identify and describe the types of peer experience that might engender each type of influence.

Historically, three aspects of children’s peer relations have come to be thought of as “negative” (i.e., adverse) peer experiences. The first is *peer rejection*. This construct denotes one aspect of peer *group* relations, specifically those contexts in which children (i.e., an individual) are disliked by the majority of members of their peer group. Peer rejection, therefore, constitutes an attitudinal variable – one that reflects the collective valence of group members’ sentiments (i.e., disliking) toward specific individuals within the group (Buhs & Ladd, 2001). A sizeable body of predictive evidence attests to the fact that peer‐rejected children are at greater risk for numerous adverse develop- mental outcomes (e.g., internalizing problems, externalizing problems, school failure, etc.; see Ladd, 2005, 2006; Parker & Asher, 1987) and, for this reason, peer rejection has been regarded as a “negative” peer experience.

*Peer exclusion*, in contrast, refers to peers’ attempts to marginalize children, or limit their participation in social interactions and activities. Rather than an attitudinal construct, peer exclusion is defined in behavioral terms (see Ladd & Profilet, 1996; Ladd et al., 2009) and its meaning is similar to “social ostracism” (i.e., being ignored, avoided, shunned) as it has been defined in research on adults (e.g., see Williams, 1997). When chil- dren experience peer exclusion, they are subjected to peers’ attempts to isolate them (e.g., peers overlook, ignore, neglect; fail to invite, include a child), or actively prevent them from participating in ongoing social interactions or activities (e.g., reject, refuse, overrule a child’s social overtures or entry bids; terminate partici- pation, eject a child from activities). Because peer exclusion also has been linked with adverse developmental outcomes (see Buhs et al., 2006), it has been deemed a “negative” peer experience.

The construct of *peer victimization* refers to harsher forms of peer maltreatment, such as when children fre- quently are the recipients of peers’ aggressive overtures. Typically defined in behavioral terms (e.g., the fre- quency with which a child is verbally, physically, relationally, or otherwise aggressed upon or bullied), this construct differs from peer exclusion in that it denotes exposure to maltreatment (i.e., abuse by peers) and a greater likelihood of harm to the recipient or victim. Substantial evidence links peer victimization with adverse developmental outcomes (see Reijntjes et al., 2010; Reijntjes et al., 2011; Troop‐Gordon, 2017) and, thus, cor- roborates its designation as a “negative” peer experience.

### So1itude’s Re1ation to Negative Peer Experiences: Deve1opmenta1 Course and Directions of Effect

In this section, we undertake an analysis of available evidence on solitude and negative peer experiences with the goal of explicating current knowledge about two principal questions: (1) When in the course of children’s devel- opment does solitude, in its various manifestations, become associated with negative peer experiences? and (2) How does solitude (i.e., in its various manifestations) and negative peer experiences (i.e., in its various relational forms) influence each other over the course of children’s development? As a heuristic tool, we consider evidence bearing on two opposing premises – one asserting that solitude fosters negative peer experiences and the other contending that negative peer experiences precipitate or exacerbate social withdrawal or solitude.

##### Premise 1: Solitude, When Manifested in Contexts that Call for Social Engagement, Fosters Negative Peer Experiences

Evidence bearing on this premise tends to come from studies where investigators have examined one or more forms of solitude and either postulated (i.e., worked from the premise that) or investigated (i.e., as a

longitudinal predictor) solitude as an *antecedent* of children’s negative peer experiences. In many cases, these investigative efforts have been guided by frameworks (e.g., theory, models) in which solitude is construed as a preexisting child characteristic (e.g., organismic, temperamental disposition; early attachment consequence) that, when expressed in subsequent social contexts (e.g., peer settings, such as classrooms), has the potential to elicit negative responses from agemates.

In the sections that follow, findings pertinent to this premise are organized by age period and, for each of the studies reviewed, the researchers’ investigative strategies are profiled on five focal dimensions (see Table 9.1): study participants (e.g., sample sizes, ages, nationalities), forms of solitary subtypes investigated (e.g., shy or anxious‐solitary, unsociable, socially avoidant), study design (i.e., single vs. multiple assessment occasions), analytic strategy (i.e., variable‐ vs. person‐centered), and targeted forms of negative peer experience (i.e., peer rejection, peer exclusion, peer victimization).

*Early childhood.* Solitude’s relations with negative peer experiences have been studied more extensively with young children than with any other age group. This research emphasis likely stems from theoretical considerations, such as the assumption that the manifestations (i.e., phenotypical behavior) of inherent predispositions (e.g., genotypes, such as temperamental shyness, unsociability) are most observable or detectable early in children’s development. Thus far, most of the evidence assembled on young children comes from variable‐centered studies in which investigators have assessed features of children’s solitude and negative peer experiences concurrently.

In an early study conducted with 40 kindergarteners, Phillipsen et al. (1999) examined the association between children’s shy‐withdrawn behavior and their classroom peer acceptance. Shyness was rated by teachers and par- ents, and estimates of peer acceptance were obtained from children, teachers, and parents. When evaluated in the context of other social‐behavioral measures, shyness was found to be a significant, negative correlate of teacher‐ rated peer acceptance (which reflects the degree to which a child is well‐liked by the larger peer group).

In a subsequent study of 199 preschoolers (ages three to five), Coplan et al. (2004) concurrently measured two forms of solitude – shyness (i.e., conflicted shyness) and unsociability (i.e., social disinterest) – along with several features of children’s social adjustment, including peer exclusion. Parents rated both forms of solitude, and teachers estimated children’s exposure to peer exclusion. Correlational analyses revealed that boys who were rated higher in shyness were more likely to be excluded by peers. For girls, this relation was nonsignifi- cant. Higher unsociability, regardless of gender, also correlated positively with peer exclusion.

Another team of investigators (Chen et al., 2006) studied peers’ responses to preschoolers’ reticent behaviors (i.e., onlooking, unoccupied behaviors). The study was conducted with four‐year‐olds in two different cultural contexts (i.e., 200 Chinese children; 180 Canadian children) and all participants were observed during a labora- tory play‐group activity. Chen et al. found that, in Canada but not China, peers were more likely to reject chil- dren who exhibited higher levels of reticence. In China, by comparison, reticence was not as associated with peer rejection and, in fact, peers more often responded to reticence with approval or cooperation.

Coplan et al. (2014) developed a child‐report measure of “preference for solitary activities,” (i.e., the PSPI) and found that scores for this index correlated positively, and to a similar magnitude, with mothers’ ratings of shyness (*r* = 0.18; *p* < 0.05) and unsociability (*r* = 0.15; *p* < 0.05). After administering this measure to a sample of 193 Canadian preschool and kindergarten children, the investigators found that children who more often said they preferred solitary play activities tended to see themselves as less accepted by peers. This same propen- sity, however, did not correlate significantly with teachers’ ratings of peer exclusion.

In a further investigation of the PSPI with 340 kindergarteners and first graders, Ooi et al. (2018) found that peer exclusion *was* significantly and positively associated with children’s expressed preference for solitary activi- ties. Additional analyses raised the possibility that children’s asocial behavior mediated this relation, but the study’s concurrent design rendered this interpretation speculative.

Similar to Coplan et al. (2014), Sette et al. (2017) investigated the convergence between PSPI scores and mothers’ ratings of shyness and unsociability, but with a sample of 112 Italian preschoolers (i.e., three to six year olds). In contrast to Coplan et al.’s (2014) findings, this team of investigators found that children’s expressed preference for solitary activities bore a stronger relation to maternal‐rated unsociability (*r* = 0.20; *p* < 0.05) than

to maternal‐rated shyness (*r* = 0.10; n.s.). None of the three indices of solitude correlated significantly with classmates’ sociometric ratings of children’s peer acceptance.

Among the few to investigate this premise longitudinally with young children (i.e., 564 kindergarteners and first graders), Coplan et al. (2018) had parents rate three forms of solitude (i.e., shyness, unsociability, and social avoidance) several months prior to assessing children’s socioemotional functioning, including peer problems. To index children’s peer problems, a latent composite was formulated using multiple parent‐ and teacher‐ report indices, including a measure of peer exclusion. Findings from structural equations analyses revealed that two of the antecedent indicators of solitude – shyness and social avoidance – were unique and significant pre- dictors of children’s peer problems. After controlling for these two forms of solitude, unsociability failed to emerge as a significant predictor.

*Middle childhood.* Researchers also have investigated the relation between different forms of solitude and negative peer experiences during the elementary school years (i.e., grades K through six). Unlike research conducted with younger samples, the evidence assembled for this age group comes from a mixture of studies in which investigators have utilized not only concurrent and longitudinal designs, but also variable‐ as well as person‐oriented analytic strategies. Here again, much of what has been learned comes from variable‐centered studies in which both of the focal constructs have been measured concurrently.

Using a person‐centered design, Harrist et al. (1997) identified four types of solitary children (i.e., unsociable, passive‐anxious, active isolates, sad‐depressed) within a sample of 567 kindergarteners and followed each sub- type from kindergarten through third grade. The children who were designated as unsociable, unlike those in the other solitary subtypes, rarely interacted with peers but were seen by teachers as socially competent. Assessments of classroom peer acceptance, which were obtained each year, showed that unsociable children were neglected by peers for a larger proportion of school years than non‐solitary children.

In separate studies conducted with 296 Chinese children, and 122 South Korean children, Schwartz and col- leagues (Schwartz et al., 2001; Schwartz et al., 2002) examined the concurrent association between children’s submissive‐withdrawn behavior and peer victimization. In both samples, submissive‐withdrawn behavior cor- related positively with peer victimization.

In a variable‐centered study conducted with 163 third graders, Spangler and Gazelle (2009) used concurrent, multi‐informant data to examine the validity of three constructs: anxious solitude, unsociability, and peer exclusion. Results showed that, within and across most informants (i.e., less so for parents), significant positive correlations were found between measures of peer exclusion and indicators of anxious solitude and unsociability.

Using longitudinal data gathered on 1092 children, Booth‐LaForce and Oxford (2008) used person centered growth analyses to identify multiple social withdrawal trajectories (i.e., increasing, high‐then decreasing, and normative‐low) across grades one through six. Social withdrawal, and two forms of negative peer experience (i.e., peer acceptance/rejection, peer exclusion) were assessed via teacher reports. Results showed that the chil- dren who exhibited a pattern of increasing social withdrawal were most likely to experience peer rejection and exclusion as they progressed through school.

Coplan and Weeks (2010) used a person‐oriented design to investigate the socioemotional functioning of shy and unsociable six to eight year olds. From a sample of 186 children, those who fit each of the solitary subtypes were identified at the beginning of a school year and their “peer problems” were assessed at the end of the school year on a composite formed from mothers’ ratings of peer victimization and teachers’ ratings of peer exclusion. As a whole, shy children were found to have more peer difficulties than unsociable children, but con- trasts with non‐solitary children reveled specific gender differences. Both shy and unsociable boys had more peer problems than their non‐solitary counterparts, and shy girls had more peer problems than unsociable and non‐ withdrawn girls.

Shyness and peer exclusion were examined by Arbeau et al. (2010) in a study conducted with 169 first graders. Data, including mothers’ ratings of children’s shyness and teachers’ ratings of the teacher–child relationship and children’s peer exclusion, were gathered at various intervals across a school year and ana- lyzed using a variable centered strategy. A significant, positive association (*r* = 0.29) was found between

shyness and peer exclusion, and this relation was stronger when children’s relationships with their teachers were higher in dependency.

Using a short‐term longitudinal design, Menzer et al. (2010) followed a sample of 980 European and East Asian sixth graders across a seven‐month interval and examined the extent to which anxious solitary behavior predicted changes in peer exclusion and victimization. Variable centered analyses revealed that, although anx- ious solitary behavior correlated with peer exclusion concurrently (i.e., at T1), its ability to predict changes in exclusion varied as a function of children’s gender and ethnicity. Only for European‐American girls was anxious solitary behavior found to predict significant gains in peer exclusion. Results for peer victimization were gener- ally nonsignificant.

In another short‐term longitudinal study with 2437 fifth graders, Ladd et al. (2011) used a person‐centered design to identify and follow subsamples of anxious‐solitary, unsociable, and non‐withdrawn children across a single school year. Three types of negative peer experiences (i.e., peer acceptance/rejection, exclusion, and vic- timization), were assessed at the beginning and end of the school year. Results showed that anxious solitary chil- dren were worse off than unsociable children on two of the three forms of negative peer experience (i.e., peer acceptance/rejection and peer exclusion), and worse off than non‐withdrawn children on all three forms of nega- tive peer experience. In contrast, comparisons between unsociable children and their non‐withdrawn counter- parts revealed that they were less accepted and more excluded, but not more victimized. Further, unlike anxious solitary children, unsociable children tended to become less excluded by peers over the course of the school year. Coplan et al. (2013) concurrently examined the relations among 367 fourth, fifth, and sixth graders’ social motivations (e.g., shy, preference for solitude), solitary behavior (observed), and two forms of negative peer experience (i.e., perceived popularity and peer victimization). Data for the various constructs were gathered across a school year, and analyzed using both variable‐ and person‐centered strategies. Variable‐centered analy- ses indicated that both forms of motivation – shyness and preference for solitude – were similarly associated (positively) with observed solitary behavior. In turn, all three indicators of solitude – shyness, preference for solitude, and solitary behavior – correlated negatively with perceived peer acceptance. Only one of the three solitary indicators – shyness – correlated positively with peer victimization. Person‐centered analyses were used to identify three subtypes of solitary children (i.e., shy‐conflicted, unsociable, avoidant) and a non‐solitary com- parison sample. Unfortunately, neither perceived peer acceptance nor victimization were included in the com- parisons of subtypes. In a subsequent study, however, Coplan and colleagues (Coplan et al., 2015) found that children of a similar age (i.e., 9 to 12 year olds) who exhibited higher levels of nonsocial behavior reported

lower levels of perceived peer acceptance.

Shell et al. (2014) followed a sample of 688 children from third through seventh grade and obtained peer reports of classmates’ anxious solitary behavior, peer exclusion, and peer victimization. Person centered growth analyses, comparing anxious solitary with average youth, revealed that anxious solitary youth had elevated levels of exclusion in elementary and middle school, but exhibited a modest decline in exclusion relative to average children following the transition to middle school. A similar pattern of results was obtained for peer victimization.

In the context of other objectives, Liu et al. (2019) examined concurrently the relations between shyness, peer rejection, and peer victimization with a sample of 547 Chinese fourth and fifth graders (mean age: 10.35). Indicators of all three constructs were obtained using peer‐report items from the Revised Class Play. Results indicated that shyness correlated positively and significantly with both peer rejection and victimization and, in addition, revealed that these relations were stronger among boys than among girls.

*Adolescence.* Investigators have also studied solitude and solitary subtypes (e.g., anxious solitary/shy, unsociable, avoidant) with samples of adolescents, as well as young adults (for a review, see Coplan et al., 2019). The principal objective in many of these studies has been to examine solitude’s relation to interpersonal adjustment, and in some cases, investigators have assessed one or more forms of negative peer experience (i.e., peer rejection, exclusion, victimization).

Bowker and Raja (2011) recruited 194 young adolescents (mean age: 13.35) in India and concurrently exam- ined the relations between shy, unsociable, and avoidant solitary behavior and three aspects of participants’

peer relations, including peer acceptance, exclusion, and victimization. Results showed that, whereas shyness correlated negatively with peer acceptance, both shyness and unsociability correlated positively with peer vic- timization. Examination of the relative associations between solitary and peer relations indicators revealed that shyness and avoidance were independently linked with peer exclusion. Additional findings from the same sam- ple (Bowker et al., 2012) suggested that some of these linkages were moderated by participants’ gender, aggres- sive behavior, or both.

Another cross‐sectional study was conducted with 384 12‐ to 14‐year‐olds from Finland (Ojanen et al., 2017). Self‐report measures were used to assess two forms of solitude, including anxious‐withdrawal (i.e., shy, fearful, timid behaviors) and unsociability (i.e., disinterest in social contact, preference for solitude). Variable‐centered analyses (i.e., path analyses) revealed that anxious‐withdrawal, but not unsociability, was associated with higher levels of peer victimization.

Finally, Markovic and Bowker (2015) utilized a short‐term (i.e., three months) longitudinal design to inves- tigate whether peer‐valued characteristics (e.g., humor, prosocial behavior) moderated the associations between anxious‐withdrawal (i.e., shyness) and two facets of young adolescents’ peer relations (i.e., peer acceptance or popularity, peer victimization). The sample for this study consisted of 271 middle‐school stu- dents (i.e., mean age: 11.54) from Buffalo, New York, and data for all measures were obtained using peer‐ reports methodology (i.e., nominations from schoolmates). Findings suggested that peer‐valued characteristics moderated the associations between anxious‐withdrawal and certain aspects of adolescents’ peer relations (e.g., victimization), but that the direction and strength of these associations often differed depending on the adolescents’ gender.

In the next section we consider how the evidence assembled thus far reflects on Premise 1, or the assertion that solitude fosters negative peer experiences. Consideration is given to the strengths and limitations of the existing database, advances in knowledge, and potential directions for future research.

##### Empirical Status of Premise 1

The hypothesis that solitude prompts negative peer experiences is derived from a general process model in which it is assumed that (1) organismic factors (e.g., child temperament) and/or early rearing experiences (i.e., parenting, parent–child attachment, etc.) contribute to children’s motivation to seek solitude, and (2) children’s expressions of solitary behaviors (e.g., subtypes of solitude) within social contexts engender negative responses from peers. Although the precursors of solitude have received some attention (e.g., see Booth‐LaForce & Oxford, 2008), more has been learned about the latter than the former of these propositions. In nearly all of the studies reviewed herein, the principal research aim has been to identify (and discriminate among) behavioral expressions of solitude and determine the extent to which the identified behaviors are associated with specific aspects of children’s psychosocial development, including negative peer experiences.

Thus far, this premise has garnered more investigative attention, and received more empirical support than its counterpart – that is, premise 2 – the supposition that negative peer experiences precipitate or exacerbate social withdrawal and solitude. The strongest support for the inference that solitude, in one or more of its behavioral expressions, provokes negative peer experiences comes from studies in which investigators have examined solitude as an antecedent rather than a concurrent correlate of peer adversity. In nearly half of the studies that bear on this premise, investigators conducted longitudinal studies and utilized either (1) variable‐ centered analyses to examine solitude as predictor of subsequent peer adversity, or (2) person‐centered analyses to identify solitary subtypes and chart temporal changes or growth in peer adversities. Although not conclu- sive, the results produced by these investigative strategies largely have been consistent with premise 1, and thus strengthen the inference that solitude, when expressed in contexts that call for social engagement, can be a risk factor for peer adversity.

Evidence relevant to this premise is, however, not as specific about the forms of solitude that are likely to trigger peer adversity. Of the forms of solitude investigated, shyness or anxious solitude appears to have received the most research attention, followed closely by unsociability. Although researchers define and opera- tionalize these constructs differently across studies, the body of evidence produced thus far implies that both

forms of solitude are associated with peer adversities. This conclusion appears to hold even if consideration is restricted to data gathered longitudinally. Findings from longitudinal studies are mixed, with some studies implicating shyness, others unsociability, and still others both shyness and unsociability as precursors of peer adversities. Accordingly, it remains unclear whether these two forms of solitude pose equal or differential risk for negative peer experiences. Addressing this issue will be an important priority for future studies.

Contemporary evidence also provides little insight into the forms of peer adversity that are likely to result from children’s propensity to engage in specific forms of solitude. Peer exclusion has been studied more exten- sively than peer rejection or victimization, but it is unclear why investigators have more often focused on this particular form of peer adversity. Thus far, there has been no systematic attempt, either conceptually or empiri- cally, to differentiate among the forms of peer adversities that are likely to befall shy versus unsociable versus socially avoidant children. It may be erroneous to assume that, when peers react negatively to children with differing solitary propensities, they do so in similar ways. Peers’ adverse reactions to differing expressions of solitude may vary in form or severity, thereby posing different levels of risk. Victimization, for example, is a more abusive form of peer maltreatment than disliking (e.g., rejection). In future studies, it will be important to incorporate multiple forms of peer adversity and systematically compare their associations with differing manifestations of solitude.

Next we turn our attention to the second of the two premises considered in this chapter. This premise con- tends that negative peer experiences precipitate or exacerbate social withdrawal and solitude.

##### Premise 2: Negative Peer Experiences, Particularly When Severe or Chronic, Precipitate or Exacerbate Social Withdrawal and Solitude

Evidence bearing on this premise is found in studies where investigators have examined one or more forms of negative peer experience and either postulated or investigated these experiences as *antecedents* of social withdrawal or solitude. Research of this type has been predicated upon frameworks (e.g., theory, models) in which negative peer experiences are conceptualized as stressors that alter children’s social orientations in ways that motivate them to seek solitude or avoid peer contexts and interactions (see Ladd et al., 2014).

Because only a few studies yield evidence that bear on this premise, it was not possible to categorize findings by age period. However, we again profile pertinent investigations on five focal dimensions (see Table 9.1): study participants (e.g., sample sizes, ages, nationalities), investigated solitary subtypes, study design (i.e., single vs. multiple assessment occasions), analytic strategy (i.e., variable‐ vs. person‐centered), and targeted forms of negative peer experience (i.e., peer rejection, peer exclusion, peer victimization).

Gazelle and Rudolph (2004) gathered data on 519 children at three time points (i.e., fall fifth, fall and spring sixth grade) and, on each occasion, obtained teacher reports of children’s anxious‐solitary behaviors, peer exclusion, and socially avoidant (i.e., socially helpless) behavior. Data were analyzed with both variable‐ and person‐centered strategies. After examining variable relations at wave 1, growth analyses were used to identify high‐ and low‐solitary anxious subgroups and track changes in social avoidance (and other variables) over time. Results showed that children in the high anxious‐solitary subgroup had different social avoidance trajectories depending on their level of peer exclusion. Whereas those who experienced higher levels of peer exclusion became increasingly socially avoidant, those who were less excluded exhibited no such change and, in fact, became less avoidant over time.

Similar findings were reported by Oh et al. (2008). In this study, 392 children were followed from fifth through eighth grade and, in addition to other measures, an index of social withdrawal and a composite that indexed both peer exclusion and victimization were obtained both before (i.e., fall and spring grade five) and after the transition to middle school (i.e., fall and spring of grade six; spring of grade eight). Person‐centered analyses (i.e., growth mixture modeling) were utilized to distinguish three trajectory classes (i.e., low‐stable, increasing, and decreasing social withdrawal), and to examine predictors of subgroup membership and patterns of within‐ group change. The investigators found that, after the transition to middle school, greater versus lesser exposure to peer exclusion/victimization predicted differential growth within the increasing and decreasing trajectory

groups. For children in the increasing class, those exposed to higher levels of exclusion/victimization became more solitary over time. For children in the decreasing class, those experiencing lower levels of peer exclusion/ victimization exhibited sharper declines in withdrawal over time.

In a study that followed 383 children across the entire period of formal schooling (i.e., grades K to 12), Ladd et al. (2019) examined associations among the timing and duration of peer victimization and patterns of con- tinuity or change in children’s solitary behavior. Five victimization trajectory classes emerged from person‐ centered growth analyses, capturing individual differences in victimization frequency and continuity (i.e., high‐chronic, moderate‐emerging, early victims, low victims, and non‐victims). Changes in solitary behavior across grades were examined for the victimization trajectory classes and results showed that chronic victims (i.e., those in the high‐chronic class), when compared to non‐victims, were not only more solitary as they began school, but also became significantly more solitary over the course of their school careers.

With a sample of 601 Chinese children and adolescents, Ding et al. (2019) assessed self‐reported motivations for social withdrawal (i.e., social avoidance) and negative peer experiences (i.e., peer rejection, victimization) on two occasions separated by a nine‐month interval. Cross‐lag analyses were used to test alternative predictive relations, including paths from earlier social avoidance motivations to later negative peer experiences and vice versa. Results showed that, whereas prior social avoidance predicted incremental changes in negative peer expe- riences, earlier peer problems did not forecast changes in social avoidance.

##### Empirical Status of Premise 2

Investigations that have addressed this premise have been predicated upon frameworks in which negative peer experiences are conceptualized as stressors whose impact upon children varies as a function of the child’s disposition, the form of social adversity (e.g., peer group rejection, peer exclusion, peer victimization), and the frequency and/or severity of the adversities (e.g., transient vs. chronic; level of intensity, abusiveness; see Ladd, 2003). Also implicit in these frameworks is the supposition that stress‐inducing peer adversities alter children’s social orientations, motivating some children to “move away” from others by seeking solitude and withdrawing from or avoiding peer contexts and interactions.

In contrast to its counterpart, this premise has received lesser investigative attention and garnered lesser empirical support. Because this premise is less well investigated, conclusions about its validity remain tentative. Relevant findings are few because it has been rare for investigators to examine changes in children’s solitude as a function of their peer experiences. Likewise, only a limited range of negative peer experiences and types of solitude has been investigated thus far. Clearly, these gaps need to be addressed in future studies.

One strength of the existing investigations, however, is that all have incorporated longitudinal designs and, in all but one instance, person‐centered analyses were utilized to distinguish among solitary subtypes and to examine peer adversities as antecedents of solitude (i.e., changes, growth in children’s solitary behaviors). Although limited in scope, the evidence produced by these studies lends stronger support to the conclusion that peer adversities maintain or *exacerbate* rather than *instigate* children’s solitary propensities. Ding et al.’s (2019) findings are the exception in that children’s prior peer difficulties did not appear to alter (i.e., strengthen) their social avoidance motivations. In all of the other relevant longitudinal studies (Gazelle & Rudolph; 2004; Ladd et al., 2014; Oh et al., 2008), however, investigators found that children who were initially disposed toward solitude became more solitary after they experienced peer adversities.

The majority of these findings are consistent with propositions advanced by person by environment and diathesis‐stress explanations of maladjustment (see Gazelle & Ladd, 2003; Ladd, 2003) – particularly, the tenet that individuals who possess certain vulnerabilities (e.g., solitary dispositions) are more susceptible to the harmful effects of particular environmental stressors (e.g., peer adversities). In the present context, it might be argued that relational adversities, such as peer rejection, exclusion, and victimization, affect solitary youth more adversely because such experiences reinforce the emotions (e.g., reticence, fear of harm or abuse) and motivations (e.g., avoidance of, disinterest in peers) that underlie their preexisting propensities to seek solitude.

It is perhaps too early, however, to conclude that peer adversities strengthen solitary behavior only in chil- dren who are predisposed toward solitude. Indeed, both Gazelle and Rudolph (2004) and Oh et al. (2008) report findings that are suggestive of an association (i.e., initially or over time) between peer exclusion and solitary behavior even among non‐solitary children. It is conceivable that, independent of children’s solitary propensi- ties, the distress induced by peer adversities might cause some children to withdraw or seek solitude, or in the case of severe or lasting adversities, lead some children to adopt new or altered social orientations (e.g., become less sociable and more solitary). Such alterations might occur if chronic adversities transform children’s emo- tions (e.g., distress, anxiety; see Ladd et al., 2019) or their peer perceptions, expectations, and beliefs (e.g., inter- personal trust, perceived support; see Ladd et al., 2011) in ways that discourage social engagement. This possibility warrants attention in future studies.

It also remains to be determined whether some forms of negative peer experience are linked more closely with the development of solitude or changes in children’s solitary trajectories. It might be argued, for example, that victimization has stronger effects on children’s social orientations than rejection (i.e., disliking by peers) or exclusion (e.g., isolation, neglect by peers) because it constitutes a more direct and potentially harmful form of peer maltreatment (i.e., verbal, physical abuse). Including this or other pertinent process‐oriented hypotheses in future investigations might lead to a better understanding of how negative peer experiences are associated with changes in children’s social orientations. Indeed, recent findings by Baardstu et al. (2019) suggest that negative peer experiences during childhood may play a role in shaping adolescents’ personality development, including inhibiting social propensities such as extroversion.

Likewise, next to nothing is known about how specific peer adversities are related to the onset or progression of different solitary propensities. It might be the case that peer adversities play a greater role in the develop- ment of some solitary propensities than others (e.g., shyness vs. unsociability). However, current findings sug- gest only that anxious solitude (Gazelle & Rudolph; 2004) and social withdrawal (i.e., shyness; Oh et al., 2008) may be amplified by peer exclusion, and children’s preference for solitude may be magnified by chronic peer victimization. In future studies, more might be learned about this issue by comparing the growth rates of dif- ferent forms of solitude in the context of specific peer adversities.

Achieving greater insight into the interplay between solitude and peer adversities within and across develop- mental epochs most likely will require additional theoretical and empirical innovations. In the next section, we speculate about research priorities that might help to bring about such advances.

##### Additional (Future) Research Priorities

In recent years, advances in theory, measurement, research design, analytic strategies, and evidence have extended knowledge about the development of solitude in children and youth. Certain investigative foci and practices have played a pivotal role in bringing about these innovations, and we consider them here because they likely will remain important for moving the discipline forward. In addition to areas of strength and prom- ise, we also identify investigative limitations and contemplate how these might be addressed in future research. Important strides have been made in the conceptualization of solitude as a multidimensional construct, and in the operationalization and measurement of solitary subtypes. Progress in these areas have advanced researchers’ efforts to isolate and distinguish distinct facets of solitude, operationalize corresponding constructs, and develop reliable and valid assessment tools. Owing to these efforts, there is now greater uniformity in the way researchers think about and describe (i.e., more homogeneous construct definitions and terminology) the specific facets of solitude. Perhaps in the near future, investigators could begin to designate best practices for the measurement of

specific constructs and, ultimately achieve greater standardization in instrumentation across studies.

Similarly, progress in research design and analytic strategies has changed the ways that solitude is studied, and altered the nature of empirical discoveries. Increasingly, cross‐sectional research is being replaced by longi- tudinal studies and, in large part, this trend has paved the way for researchers to address dynamic rather than static questions about the development of solitude. The use of multi‐wave studies and time‐varying assess- ments has made it possible to study the developmental course of solitude, and map both stability and change within and across specific age periods. Such designs have also made it possible for researchers to incorporate

additional variables (e.g., negative peer experiences) and simultaneously examine temporal relations that reflect on hypothesized directions of effect (e.g., as illustrated in by research reviewed in relation to premises 1 and 2). Person‐centered analytic strategies have augmented such discoveries by allowing researchers to simultaneously explore these aims with children who display distinct solitary propensities.

For progress to continue in this area of investigation, it will be important for researchers to formulate and pursue objectives that will build on past accomplishments and increment knowledge in theoretically meaning- ful ways. For those seeking to explicate the association between solitude and peer adversities, the following objectives merit consideration.

First, the implementation of longitudinal designs and person‐centered analyses has proved profitable thus far and it is probable that these strategies will continue to pay meaningful dividends in the future. Most likely, this combination of strategies will remain one of the most productive ways for researchers to learn about the development of solitude (i.e., continuities, discontinuities) in the context of peer adversities across key devel- opmental periods for youth who manifest different solitary propensities. With the potential exception of meas- urement studies, it seems likely that we are fast approaching a point where cross‐sectional designs, and the analysis of concurrent data, have outlived their usefulness.

Second, although there has been increasing use of longitudinal studies, both the epochs investigated and the intervals across which data have been gathered remain relatively limited. Thus far, more longitudinal studies have been conducted with children (i.e., during early or middle childhood) than with adolescents and young adults and, in most of these studies, participants have been followed for relatively brief intervals (i.e., over a single school year, across two to three grade levels). Expanding the longitudinal time frame for these studies would contribute to what we know about the developmental course of solitary propensities, links with peer adversities, and growth patterns (i.e., continuities versus discontinuities) across specific developmental periods and major contextual transitions.

Third, current knowledge about the three principal solitary subtypes – shy or solitary‐anxious, unsociable, and socially avoidant – is imbalanced because investigators have studied more extensively the first of the three forms. A more balanced and informative database could be created if, in future longitudinal studies, investiga- tors identified and tracked children who manifested each of the three subtypes, and determined whether sub- type members exhibited differential growth patterns for solitary behaviors (stable, changing solitary trajectories). An additional, previously articulated objective would be to determine whether peer adversities were associated with one or more of the subtypes’ solitary trajectories, either as antecedents (i.e., as potential instigators) or as consequences (i.e., as potential outcomes).

Fourth, the role of gender in the development of solitude remains poorly understood, and it remains unclear whether solitude, in its various manifestations, is differentially linked with peer adversities for males and females. There is some evidence to suggest that the links between solitude and peer adversities differ by gender, but extant findings are sparse and inconsistent. For example, there are reports of gender differences in the asso- ciations between shy or anxious‐solitary behavior and peer exclusion, but the findings are discrepant across developmental periods. Among preschoolers, for example, Coplan and Weeks (2010) found that shyness was associated with peer exclusion for boys but not girls. Menzer et al. (2010), in a study conducted with sixth grad- ers, found the reverse. Only among girls was anxious solitary behavior found to be associated with peer exclu- sion. Whether these findings hold for peer adversities other than exclusion remains to be discovered. Other findings imply that solitary girls’ versus solitary boys’ risk for peer adversities might depend on the form of soli- tude they manifest. Coplan and Weeks (2010) found that shy grade‐school girls had fewer peer difficulties than their unsociable counterparts. Among males, however, the likelihood of peer problems was just as great for shy as for unsociable boys. It seems unlikely that these seemingly diverse and contradictory findings will be recon- ciled until investigators systematically examine gender differences across age, forms of solitude, and types of peer adversity.

Finally, because the investigation of ethnic and cultural differences in solitude is at an early stage, sample diversity should be an important consideration in future studies. Evidence gathered thus far (e.g., see Menzer et al., 2010) suggests that it would be erroneous to assume that solitude’s manifestations, developmental course, and association with peer adversities are invariant across cultures.

# Social Withdrawal During Adolescence: The Role of Peers

Although initially neglected in developmental research, *social withdrawal*, the behavioral tendency to avoid familiar and unfamiliar peers, is now one of the most commonly studied individual child/adoles- cent characteristics (for reviews, see Rubin & Coplan, 2004; Rubin et al., 2009). The construct of social withdrawal garners such empirical attention today because there is a large body of research showing that it is one of the strongest risk factors for such developmental psychopathology outcomes as elevated levels of social anxiety and depressive symptoms (e.g., Chronis‐Tuscano et al., 2009). Evidence also consistently links child and adolescent social withdrawal with significant impairment in other domains, including close relationships and academic achievement (e.g., Oh et al., 2008; Rubin et al., 1993). Notably, the effects of withdrawing from peers during childhood and adolescence appear to be long‐term, with negative implications not only for psychological health and well‐being during emerging and middle adulthood, but also for employment attainment and marriage involvement (for review, see Nelson & Millett, Chapter 11). In the sections below, we take a closer look at the research on social withdrawal and related constructs (e.g., shyness, anxious solitude, behavioral inhibition, unsociability) during the developmental period of *adolescence* (10–18 years). Other chapters in this handbook provide general overviews of the empirical literature on social withdrawal and solitude and associated outcomes during childhood and adolescence (see Coplan, Ooi, & Hipson, Chapter 8). In this chapter, we focus specifically on the role of *peers,* defined herein as same‐age, same‐ sex, same‐class/grade‐mates, in the lives of socially withdrawn adolescents. We do so because, by definition, social withdrawal involves the avoidance of peers. It is also during adolescence when youth spend the majority of their waking hours in school and in the company of peers, and when peer influence becomes increasingly strong, especially relative to the influence of parents (LaFontana & Cillessen, 2010). Finally, as reviewed below, there is strong evidence implicating several peer experiences, such as peer exclusion (i.e., being left out of group activities), as both strong contributors to, and outcomes, of adolescent social withdrawal (see also Ladd

et al., Chapter 9).

We first provide an overview of social withdrawal research that details recent expansions of traditional social withdrawal definitions to include different motivations or reasons for social withdrawal. We next offer some potential reasons why social withdrawal during adolescence has been relatively neglected in favor of research on social withdrawal during childhood, and most recently, emerging adulthood. We then review the published work on adolescent social withdrawal and peers at the group (e.g., peer exclusion) and dyadic (e.g., friendship) levels of social complexity (Rubin et al., 2015) and conclude with suggestions for future research.

##### Overview of Social Withdrawal Research

As noted above, social withdrawal refers to the behavioral tendency to consistently avoid familiar and unfamil- iar peers (Rubin et al., 2009). This behavioral tendency tends to be stable across contexts (e.g., in school and extracurricular activities) and over time, and is a strong individual risk factor for short‐ and long‐term psycho- logical, social, academic, and vocational difficulties during childhood, adolescence, and emerging adulthood (e.g., Katz et al., 2011; Rubin et al., 2009; Rubin et al., 1989; Schneider et al., 1998).

*Social withdrawal motivations.* To date, most studies of social withdrawal have focused on social withdrawal that is motivated by social fears and anxieties. This type of withdrawal, commonly referred to as *anxious‐ withdrawal,* is similar to the constructs of *shyness*, *behavioral inhibition*, *shyness‐sensitivity*, and *anxious‐solitude*, all of which emphasize anxiety‐driven social avoidance (Chen et al., 2009; Crozier, 1995; Gazelle & Ladd, 2003). Thus, in this chapter, we will use the general term *anxious‐withdrawal*, and in some cases, the more specific term *shyness* (when describing research that compared shyness to unsociability and social avoidance), to describe all research focused on anxiety‐driven social withdrawal. Such work typically utilizes peer nomination or observational assessments of shy and avoidant behavior, although self‐report measures have also been used (Bowker & Raja, 2011; Eggum‐Wilkens et al., 2019).

In recent years, researchers have also begun to consider other reasons or *motivations* for social withdrawal (Coplan & Armer, 2007; Coplan et al., 2015). Guided by Asendorpf’s (1990) approach and avoidance model of social withdrawal, investigators now identify and examine the unique concomitants of different types of social withdrawal that vary by the underlying motivation for the behavior. For instance, *unsociability* refers to social withdrawal that is motivated by weak approach and weak avoidance motivations, and *social avoidance* is a type of social withdrawal motivated by weak approach and strong avoidance motivations (Bowker & Raja, 2011; Nelson, 2013). In approach and avoidance models, *shyness* is thought to be motivated by strong approach and avoidance motivations. In other words, shy youth want to be with others but are too fearful and anxious to do so. In addition to differences in approach and avoidance motivations, unsociable youth are oftentimes charac- terized by non‐fearful preferences for solitude (i.e., they enjoy being alone), whereas avoidant youth are char- acterized by strong dislike for social interaction. Although there are several exceptions, shyness and avoidance are found to be related to greater psychosocial difficulties relative to unsociability, and thus, unsociability has been characterized as a relatively “benign” form of social withdrawal (Bowker & Raja, 2011; Coplan et al., 2015; Coplan & Weeks, 2010).

*Research on social withdrawal during adolescence.* Adolescence is one of the most understudied developmental periods in the social withdrawal literature. Today, the majority of withdrawal researchers focus on the early childhood developmental period, likely due to an initial emphasis on solitary play behaviors in this area of research, and also due to interest in identifying early biological, physiological, and environmental precursors to such behaviors and associated outcomes (i.e., overprotective parenting, right frontal asymmetry; e.g., Nelson, Rubin, & Fox, 2005; Pérez‐Edgar et al., 2010). As described elsewhere in this handbook (Nelson & Millett, Chapter 11), there has been recent theoretical and empirical interest in understanding social withdrawal during the third decade of life, or during the emerging adulthood developmental period, but such growth has not been found in adolescent research. *Why not?*

We suspect that there are several reasons for the relative neglect of adolescents in social withdrawal research. For one, it may be due, in part, to the lack of free time or recess during the school day during which socially withdrawn behaviors can be easily observed. In addition, in the school settings in which most adoles- cents attend, there is not usually one teacher who spends the entire day with one group of students and, thus, there is no one person who can accurately report on social behaviors that typically occur outside of the class- room context (i.e., in hallways, lunch room, school bus). Adults, including teachers but also parents, also have a limited perspective on not only behaviors but also the internal states of adolescents that might motivate socially withdrawn behavior. Adolescents also report increased desire and need for solitude and alone‐time,

and thus it may be that some socially withdrawn behaviors are viewed by parents, teachers, clinicians, and even researchers, as relatively normative and not of great concern. Finally, peer nomination measures are considered the gold standard in adolescent social withdrawal research. Yet, such measures are most com- monly conducted in school settings and require around 60% of all eligible students to participate, which can be difficult to achieve as secondary schools are often reluctant to offer class time for assessments when their students have standardized tests for which to prepare. Self‐report measures can instead be used with less par- ticipant and school burden, but there are few well‐validated and reliable measures available (for exception, see Bowker & Raja, 2011).

In the limited research on social withdrawal during adolescence, the negative peer and psychological corre- lates and consequences of withdrawing from peers do appear similar to those found in studies of children and emerging adults (e.g., Bowker & Raja, 2011; Markovic & Bowker, 2017; Ojanen et al., 2017). However, we believe that additional research of social withdrawal and peers during adolescence is very much needed. As described in detail below, we believe it is time for researchers to think carefully about the unique developmental features of adolescence, such as adolescents’ expanding social worlds, in the design of studies of adolescent social withdrawal and peers.

We now describe the extant literature on adolescent social withdrawal and peers. In accordance with the framework described by Rubin and colleagues (Rubin, Bukowski et al., 2006; Rubin et al., 2015) we distinguish between peer experiences at two levels of social complexity: the group‐level, which reflects how youth fare with the larger peer group, and dyadic‐level, which reflects how youth fare in the context of close dyadic relation- ships. That said, we acknowledge that these levels are interrelated and oftentimes bidirectional in influence.

##### Social Withdrawal and Peers During Adolescence

Although it is true, by definition, that socially withdrawn adolescents spend considerable time away from and avoiding peers, it is also the case that they cannot avoid their peers entirely. This is especially true in the school setting, which is the context for most adolescent withdrawal research, where there is forced peer interaction during class time, in the hallways between classes, and during lunch and free time (Gazelle, 2008). Moreover, relative to childhood, adolescence is a time when friendships become increasingly intimate, and peer experi- ences, in general, become increasingly important to health and well‐being (LaFontana & Cillessen, 2010; Rubin et al., 2015). Thus, important questions are: What are the peer experiences of socially withdrawn adolescents like and how do they influence socially withdrawn behavioral tendencies and associated outcomes? We answer these questions in the sections that follow.

##### Group‐Level Peer Experiences

*Rejection.* The earliest research on peers and social withdrawal focused on *anxious*‐withdrawal and peer rejection, or the experience of being actively disliked by many peers (Coie et al., 1982). It was found in such studies that anxious‐withdrawal was associated concurrently and longitudinally with peer rejection (e.g., Boivin & Hymel, 1997; Cillessen et al., 1992). It is believed that these robust findings can be attributed to peers’ judgment of anxiously withdrawn youths’ behavior as atypical and nonnormative at a time during which peer interactions, relationships, and group involvement are expected. These judgments may in turn foster strong feelings of dislike toward withdrawn youth (e.g., Younger & Boyko, 1987; Younger et al., 1993).

As a result of this early research, it is oftentimes concluded that all socially withdrawn youth of all ages are strongly rejected by their peers. A careful inspection of this existing literature, however, shows that most of these studies involved children only (e.g., Dill et al., 2004; Gazelle, 2006; Gazelle & Ladd, 2003; for notable exceptions, see Boivin et al., 1995; Rubin et al., 1993; Scholte et al., 1997). There are a few studies with combined child and young adolescent samples (e.g., DeRosier et al., 1994; Prakash & Coplan, 2007), but potential developmental differences were not examined in such work. As a result, we caution scholars from making strong conclusions that socially withdrawn *adolescents* are rejected by their peers. This is

especially true for middle and late adolescents, as we were able to locate only one study of peer rejection and social withdrawal among these older groups of adolescents; in this study of Italian late adolescents, there were *no* significant differences in rejection between shy‐withdrawn and non‐withdrawn adolescents (Ponti & Tani, 2015). Also of note, most of the work on peer rejection and adolescent social withdrawal has focused exclusively on *anxious*‐withdrawal (or related constructs). Findings from several studies suggest that shyness *and* avoidance may be more strongly associated with peer rejection than unsociability (e.g., Bowker & Raja, 2011), but all of these studies were conducted in non‐Western societies (China, India), making it unknown whether such results generalize to adolescents in Western societies (United States, Canada, Sweden) where cultural norms and expectations, and thus the “meaning” of social behaviors, dif- fer significantly.

*Victimization.* More recently, investigators have examined social withdrawal in relation to peer victimization, or repeated peer abuse in relational (e.g., being the subject of gossip), physical (e.g., being the recipient of hitting and kicking), and cyber/electronic (e.g., being harassed online and in social media platforms) forms (Oh et al., 2008; Shell et al., 2014). The research on victimization and *anxious*‐withdrawal in *children* suggests that there is a reciprocal and mutually exacerbating association between social withdrawal and victimization, such that anxiously withdrawn youth are more likely to be victimized by the peers, and victimization can then promote greater anxious‐withdrawal (Rubin et al., 2009). Such withdrawn youth may be more likely to be victimized because they are viewed as vulnerable or “easy targets” who are unlikely to successfully retaliate, and because their behavior is inconsistent with expectations of social interaction with their peer group (Gazelle, 2008; Rubin, Bukowski et al., 2006).

Anxiously withdrawn children often continue to be victimized during adolescence, although victimization tends to decrease during the transition to middle school particularly for those who are highly anxiously with- drawn (Markovic & Bowker, 2015a; Oh et al., 2008; Shell et al., 2014; Tang et al., 2017). This decrease in victimi- zation may be due to the renegotiation of peer relationships during the transition and peers’ increased appreciation for spending time alone in adolescence (Shell et al., 2014). In the limited work on different *motiva- tions* for withdrawal and peer victimization during adolescence, there is some indication that unsociable youth may avoid victimization altogether, perhaps because they do not appear visibly anxious or socially uncomfort- able like shy and avoidant youth do (Bowker & Raja, 2011; Coplan & Weeks, 2010). However, the majority of research on victimization in socially withdrawn youth has focused on anxious‐withdrawal and related con- structs (e.g., Shell et al., 2014). Such work has also tended to focus on the physical and relational forms of peer victimization to the neglect of cyber/electronic victimization.

*Exclusion.* Similar to peer victimization, the relation between anxious‐withdrawal and peer exclusion (which is related to but distinct from rejection and victimization, and involves being left out of group activities) appears to be reciprocal such that anxiously withdrawn youth are more likely to be excluded, and exclusion may in turn promote anxiously withdrawn behavior (Booth‐LaForce et al., 2012; Oh et al., 2008; Shell et al., 2014). For example, in several studies, peer exclusion was found to predict increasing anxious‐withdrawal during childhood and early adolescence (Booth‐LaForce et al., 2012; Oh et al., 2008), and anxious‐withdrawal predicted increasing peer exclusion (Shell et al., 2014).

Importantly, evidence further suggests that the peer exclusion that anxiously withdrawn youth experi- ence contributes not only to their anxiously withdrawn behaviors over time, but also to their psychological distress (i.e., depressive symptoms; e.g., Gazelle & Rudolph, 2004). However, similar to peer victimization, findings from the aforementioned Shell et al. (2014) study indicate that many anxiously withdrawn youth appear to experience significant declines in peer exclusion during the transition to middle school, suggest- ing that at least in terms of their group‐level peer experiences, many anxiously withdrawn adolescents may benefit behaviorally and psychologically from school transitions (Shell et al., 2014). It is unclear why this might be the case, but we suspect that the transition might afford opportunities for anxiously withdrawn adolescents to lose old and negative reputations for being shy and anxious. As noted before, the transition

might also correspond with changing attitudes and desires regarding solitude. It is also plausible that anx- iously withdrawn adolescents’ behaviors are less easily noticed by would‐be bullies and excluding peers in larger school contexts (relative to smaller ones at younger ages).

In the only known studies to examine multiple social withdrawal subtypes and peer exclusion, shyness and avoidance were associated uniquely with exclusion, but unsociability was not (Bowker, Markovic et al., 2012; Bowker & Raja, 2011). In addition, the association between avoidance and loneliness was mediated by exclu- sion (Bowker & Raja, 2011). Although seemingly counterintuitive that youth who prefer to spend time alone (due to social dislike) become lonely following peer exclusion, the authors suggest that these findings may indicate that many avoidant youth may be more distressed when their exclusion is imposed by others rather than of their own choosing (Bowker & Raja, 2011). However, both of these studies were conducted in a sample of Indian adolescents and should be interpreted with caution due to cultural influences.

*Group level peer experiences and the role of individual characteristics.* In recent years, investigators have begun to examine individual characteristics or other behaviors of withdrawn adolescents that might protect against or promote negative group‐level peer experiences. In one study, Markovic and Bowker (2015a) found that peer‐ valued characteristics, like humor and prosocial behavior, and gender, moderated associations between anxious‐ withdrawal and negative (i.e., peer victimization) as well as more positive (*popularity* or being viewed as popular by many and *peer acceptance* or being actively liked by many) group‐level peer experiences. For example, it was found that prosocial behavior exacerbated the risk of victimization for anxiously withdrawn youth overall, but buffered girls from low popularity. Similarly, in a study of young adolescents in India, Bowker and colleagues (2012) found that adolescents’ aggressive behaviors and gender moderated associations between specific social withdrawal motivations and peer difficulties. Overt aggression (e.g., physical or verbal) exacerbated peer problems in shy youth overall, but high levels of overt aggression in shy girls was *protective* against peer problems (Bowker et al., 2012). Taken together, these findings highlight the importance of considering the withdrawn adolescent as a *whole individual* who brings other behavioral and individual characteristics to peer interactions, which in turn, appear to influence their *group*‐level peer experiences (Gazelle, 2008). It is an untested question as to whether they also influence their *dyadic*‐level peer experiences, such as their friendships, which we now discuss.

##### Dyadic‐Level Peer Experiences

*Friendships.* Relative to the research on group‐level peer experiences, little attention has been paid to the friendships of socially withdrawn adolescents. As a result, many important questions remain, such as whether socially withdrawn adolescents benefit from nonschool friendships, which become increasingly common during the adolescent developmental period. Nevertheless, there are several studies on adolescent social withdrawal and (school‐based) friendships, which we review next with a focus on three aspects of friendship adjustment: (1) friendship involvement (or prevalence) and stability, (2) friend characteristics or with whom adolescents form friendships, and (3) friendship quality.

*Friendship involvement and stability.* In terms of friendship involvement and stability, findings indicate that the large majority (60–70%) of anxiously withdrawn children and adolescents have at least one mutual (determined by reciprocated friendship nominations) and stable friend (Ladd et al., 2011; Rubin, Wojslawowicz et al., 2006). These percentages are similar to those found in studies of non‐withdrawn youth (e.g., Parker & Asher, 1993), suggesting that despite anxiously withdrawing at the group‐level of social complexity, anxiously withdrawn youth do not appear to withdraw at the *dyadic level*.

Most of the work in this area focuses on anxiously withdrawn youth and less is known about the friendship involvement and stability of shy versus avoidant versus unsociable youth. However, findings from one study suggest *shy* young adolescents may experience more difficulties in finding and maintaining friendships relative to *unsociable* young adolescents (Ladd et al., 2011). This may be because the anxieties associated with shyness,

but not unsociability, interfere with self‐disclosure, which is a hallmark feature of adolescent friendships (Ladd et al., 2011). Additional research in this area, however, is needed, both to replicate these findings and examine possible mechanisms.

Anxiously withdrawn adolescents who are able to form mutual and lasting friendships fare better than those who do not. For instance, Bukowski and colleagues (2010) found that anxiously withdrawn young adolescents’ risk for depression is mitigated by having a mutual friend, and Markovic and Bowker (2017) showed that mutual friendship involvement protects anxiously withdrawn young adolescents from increasing loneliness and depres- sive symptoms over time. In addition, Rubin, Wojslawowicz, and colleagues (2006) found that anxiously with- drawn young adolescents with mutual best friendships were rated by peers as more sociable and popular relative to anxiously withdrawn young adolescents without mutual best friendships. Furthermore, different‐ grade friendship involvement (i.e., having a same‐school but different‐grade friend) was found to protect anx- iously withdrawn adolescent boys from victimization (Bowker & Spencer, 2010), perhaps because different‐grade friends help to reduce such withdrawn adolescents’ appearance of isolation and anxious vulnerability.

Of course, this means that friendless anxiously withdrawn adolescents are at increased risk for psychosocial difficulties. For example, anxiously withdrawn girls without mutual friendships experience increasing depres- sive symptoms over time (Markovic & Bowker, 2017), and friendlessness and friendship instability predicts increased anxious‐withdrawal across the early adolescent developmental period (Oh et al., 2008). Little is known, however, about whether such findings on the power of friendship generalize to middle and late adoles- cence and different withdrawal subtypes. Furthermore, given the risks that friendlessness and friendship insta- bility present, more research is needed on the psychological impact of *friendship dissolution*, or when friendships break up and end, for all types of withdrawn adolescents. Friendship dissolution is a common and challenging experience for most adolescents, with the large majority reporting at least one recent breakup of a best friend- ship (Bowker, 2011). Although some research suggests that anxious‐withdrawal is not uniquely predictive of friendship dissolution (Guimond et al., 2018), it is likely the case that friendship loss might be especially hurtful for anxiously withdrawn adolescents who already struggle with feelings of self‐doubt, rejection‐sensitivity, and strong tendencies to blame themselves for their social difficulties (Burgess et al., 2006).

*Characteristics of friends.* One reason why some withdrawn adolescents might find it relatively easy to form and maintain friendships is because they find similar peers to befriend. Indeed, individuals of all ages tend to form friendships with those who are similar to themselves in sex, age, behavior, social experiences, and attitudes/ values – a phenomenon commonly referred to as *homophily* (Haselager et al., 1998), and the same appears to be true for socially withdrawn adolescents. For instance, findings from several studies show that shy and unsociable adolescents are similar to their best friends in terms of shyness and prosocial behavior (Ladd et al., 2011; Rubin et al., 2006). In comparing anxiously withdrawn and non‐anxiously withdrawn groups of young adolescents, Rubin et al. (2006) also found that the best friends of anxiously withdrawn young adolescents were significantly more victimized and excluded (relative to the best friends of non‐withdrawn youth), suggesting that anxiously withdrawn youth tend to befriend others who are similar in not only in behavior but also their peer difficulties. Such similarities may exist because *shared misery* help to draw individuals together and into friendships. It is also plausible that anxiously withdrawn adolescents are forced to choose friends from a pool of similar “leftovers” who are not viewed as attractive potential friends by their more social peers.

Although such similarities might aid in the friendship formation and maintenance processes, they might also increase risk and psychological distress. Oh et al. (2008) found that friends’ anxious‐withdrawal predicted increased adolescent anxious‐withdrawal over time. Moreover, several studies show that friends’ anxiety contributes to adolescents’ own anxieties over time, likely through reinforcement and co‐rumination processes (Rose et al., 2007, Van Zalk et al., 2011). More research on friend characteristics is needed, however, as it con- tinues to be rare for adolescent social withdrawal research to consider this dimension of friendship, unlike the research on aggression and delinquency that consistently shows having aggressive and delinquent friends is one of the most powerful predictors of increasing externalizing problems over time (Dishion et al., 1999).

*Friendship quality.* Perhaps largely because anxious‐withdrawn adolescents have friends who are like themselves, their friendships are often lower in relationship quality. In this research, anxiously withdrawn adolescents report their friendships as lower in such positive friendship features as companionship, help, closeness, and security relative to their non‐withdrawn peers (Ponti & Tani, 2015; Rubin et al., 2006). Although additional observational studies of anxiously withdrawn adolescent and their friends are needed (especially of shy vs. unsociable vs. avoidant adolescents and their friends, as there are no such studies), existing ones support this notion. For example, Schneider (2009) found that anxiously withdrawn young adolescents were unassertive, quiet, and displayed little positive affect in their interactions with close mutual friends as opposed to non‐withdrawn youth and their friends. That said, there are numerous studies that have failed to find significant linkages between anxious‐withdrawal and friendship quality during early adolescence (e.g., Markovic & Bowker, 2017). This has led to suggestions that perhaps it is only the most *extreme* anxiously withdrawn adolescents that struggle with intimacy and other positive friendship provisions, and that moderate anxiously withdrawn tendencies might not interfere with high‐quality friendships. Future studies, however, will need to further explore these differences found in studies that evaluate anxious‐withdrawal categorically versus continuously.

But do anxiously withdrawn adolescents benefit from high quality friendships? The findings in this area are mixed. For instance, two studies showed that high‐quality friendships protected anxiously withdrawn adoles- cents from psychological distress and group‐level peer difficulties (Liu et al., 2018; Ponti & Tani, 2015). And yet, the study by Markovic and Bowker (2017) revealed that high friendship quality did not offer protective effects above and beyond those afforded by mutual friendship involvement, perhaps suggesting anxiously withdrawn youth may benefit more from the mere availability and visibility of a friendship than provisions such as intimacy.

There are also some findings suggesting that higher friendship quality might actually be *harmful* for certain withdrawn adolescents. As one example, a recent study showed that friendship support weakened the associa- tion between preference for solitude and depression but strengthened the association between shyness and depression (Barstead et al., 2018). Another study revealed gender differences such that higher friendship quality protected against victimization for anxiously withdrawn girls but heightened the risk for boys (Freitas et al., 2018). Taken together, the inconsistent findings regarding friendship quality and adolescent social with- drawal suggests that methodological issues and contextual factors (i.e., gender, culture, withdrawal motiva- tions) likely matter and should be more explicitly considered in future research. It is also possible that other friendship processes that are not typically assessed might account for some of the effects. For instance, there is growing evidence that certain friendship features, such as those characterized by overinvolvement or overreli- ance (e.g., social surrogacy, friend overprotection; Etkin & Bowker, 2018; Markovic & Bowker, 2015b), might be more harmful for anxiously withdrawn and shy youth because they reinforce preexisting difficulties such as low self‐efficacy or peer perceptions of vulnerability. Thus, future research should also continue to investigate these more nuanced qualities of socially withdrawn adolescents’ friendships.

##### Future Research Directions

As reviewed above, there is convincing evidence that socially withdrawn adolescents’ peers play an important role in their lives. Despite their best efforts to avoid most peers, withdrawn adolescents still encounter groups of peers who are rejecting, victimizing, and excluding, and thereby, increase their psychological distress. There is also strong evidence that socially withdrawn adolescents form mutual and lasting friendships. Such friend- ships appear to have some positive psychological effects, although the nature of the implications seem less clear when the characteristics of their friends are considered as well as the quality of the friendships.

The importance of understanding the role of peers in the lives of withdrawn adolescents is underscored by evidence that positive peer relationships can be usefully leveraged in clinical intervention efforts with adoles- cents (Bierman, 1989). Negative peer experiences can also be successfully targeted in individual and group

intervention and prevention efforts. The current knowledge base regarding socially withdrawn adolescents’ peer experiences suggests some specific ways in which treatments with withdrawn adolescents might be expanded to better include their peer experiences. For example, most withdrawn adolescents might benefit from mutual friendship involvement.

Throughout this chapter we have pointed out numerous directions for future research, such as the need for more studies on peer rejection and social withdrawal during adolescence and the need to better understand more nuanced features of socially withdrawn adolescents’ friendships. Here we conclude with two additional research directions to further our understanding of the role of peers in the lives of withdrawn adolescents, which we believe will help to inform and refine etiological theories of social withdrawal as well as available treatment methods.

*Online peer experiences.* First, all research discussed herein has focused on group‐ and dyadic‐level peer experiences that have occurred off‐line or face‐to‐face. However, the reality is that more and more adolescents’ peer interactions, for better or worse, occur in online and virtual contexts (Lenhart et al., 2015). For example, cyber‐victimization occurs online and has been shown to pose unique psychological risks. The degree to which socially withdrawn youth are victimized online is not known. On the one hand, withdrawn youth may not be targeted online if their withdrawn behaviors are not present or influential in their social networking and online behaviors. But, on the other hand, there is some continuity between online and offline victimization (e.g., Dempsey et al., 2009), suggesting that being victimized offline may place withdrawn adolescents at unique and increased risk for online victimization. Future research should consider these possibilities.

In terms of dyadic‐level peer experiences, most adolescents today use social media and text messaging to correspond and interact with their friends. Interacting online with their friends might be particularly appealing for socially withdrawn adolescents, as it eliminates many of the demands and anxieties associ- ated with in‐person interactions. Indeed, research has revealed that socially anxious youth, who are similar to socially withdrawn youth who are anxious and shy, prefer using the internet as a means of self‐disclo- sure (Valkenburg & Peter, 2007). But, the content of such self‐disclosure may be more harmful than help- ful. For instance, in a study of 10‐to 18‐year‐old Italian adolescents, Laghi and colleagues (2013) found that shy as opposed to non‐shy individuals reported sharing more negative emotional content in their online but not offline interactions with friends. Unfortunately, such negative online experiences with friends only strengthened the link between high levels of shyness and loneliness, perhaps because such negative inter- actions can be more easily revisited. Many more questions remain about the online friendship experiences of withdrawn youth, including whether there are any social or emotional benefits, if they approximate the quality of in‐person interactions, and if they help youth feel more comfortable with or foster avoidance of face‐to‐face social interactions.

*Need to Broaden Who Is Considered a Peer and the Outcomes Evaluated.* In the very beginning of our chapter, we defined peers as same‐age, same‐sex, and same‐class/grade mates. This definition is consistent with that used in most developmental research on peer experiences and stems from the large homophily literature showing that most youth befriend similar peers due to proximity and attraction (of similar peers) (Rubin et al., 2015). That said, the social worlds of adolescents expand considerably relative to childhood, and adolescents for the first time develop close and meaningful relationships with other‐sex peers and also romantic partners as well as peers whom they meet in nonschool contexts, such as their place of employment and in extracurricular and leisure activities. Such peers have been found to be influential on the health and well‐being of adolescents, and we suspect that some may be especially influential in the lives of socially withdrawn adolescents.

For example, other‐sex peer interactions and relationships have been found to be helpful in the lives of appearance‐based rejection sensitive adolescents (who expect to be rejected based on their physical appearances; Bowker, Thomas et al., 2012). Other‐sex friendships have also been shown to compensate for deficits in

same‐sex friendships during adolescence (Bukowski et al., 1999). Might the same be true for socially with- drawn adolescents? We were not able to locate a single empirical study that specifically considered the other‐ sex peer experiences of socially withdrawn youth, but we hypothesize that other‐sex peer experiences could provide a more accepting and kind peer context for withdrawn adolescents who appear to struggle signifi- cantly with same‐sex peers. But additional research is clearly needed. We also think that nonschool friendships could function protectively for socially withdrawn adolescents; such nonschool friends may not be aware of the negative in‐school peer reputations of socially withdrawn adolescents. Shy and reticent behavior might not also be judged so harshly and negatively or interfere as much with peer interaction in nonschool contexts, such as a place of employment where spontaneous and exuberant behavior may not be encouraged.

Finally, very little research has focused on the romantic relationships of withdrawn adolescents, despite a growing interest in this topic during emerging adulthood. However, many youth form their first romantic relationships during middle and late adolescence, which can function protectively or increase risk depending on the individual characteristics of the adolescent and the nature of the relationship (see Boisvert & Poulin, 2016). Understanding socially withdrawn adolescents’ early dating experiences may help explain pathways to other delayed developmental milestones, such as entry into marriage (Caspi et al., 1988). It is possible that romantic relationships are especially intimidating or challenging for withdrawn adolescents because they demand high levels of intimacy, self‐disclosure, conflict resolution, and other skills that withdrawn adolescents tend to strug- gle with, even in friendships (Starr & Davila, 2015). There is also evidence that adolescents who have a high affinity for solitude view themselves as less romantically desirable (Maes et al., 2016), potentially holding them back from seeking romantic experiences. Additional studies need to establish rates and predictors of romantic relationship involvement across adolescence and motivations for withdrawal. But, it is likely the case that with- drawn youth may simultaneously have limited opportunities to interact with potential dating partners, and deficits in relationship skills, that keep them from forming or deter others from selecting them for romantic relationships.

As the definition of a “peer” is expanded, we encourage researchers to also broaden the outcomes that they consider. Peers in the workplace may help with work performance and job advancement. Romantic relationships may aid in the expansion of social networks. Older peers may provide help and guidance on issues related to identity development or could increase exposure to drugs and alcohol or facilitate other risky behaviors. Consistent with Sullivan’s interpersonal theory of psychiatry (1953), non‐rejecting, non‐ victimizing, and accepting peers, of any type, could also help to correct negative cognitive biases that contribute to psychological distress. Most research on social withdrawal during adolescence focuses on the psychological outcomes of anxiety, depressive symptoms, and loneliness, and group‐level peer experiences, but we contend that an expansion of the definition of peers will also require an expansion of the outcomes that are considered.

### Conclusions

Peers matter in the lives of socially withdrawn youth, but perhaps especially for socially withdrawn *adolescents* due to the increased amount of time spent with peers during adolescence and the increased importance of peer interaction during this developmental period. Relative to research on social withdrawal during childhood and emerging adulthood, research on social withdrawal during adolescence has lagged behind. The same outcomes and peers studied among children are typically studied among adolescents without careful consid- eration of those that might be more developmentally appropriate and perhaps more influential in the lives of socially withdrawn adolescents. We hope that this chapter leads to new developmentally informed interest and research on socially withdrawn adolescents, who without careful attention to their peer experiences, will mostly continue to be withdrawn during emerging adulthood and beyond, with many of the same psychological and social struggles.

Social Withdrawal During Emerging Adulthood

There is a fair amount of structure (expectation for what, when, and how a person should be doing something) in the lives of children and adolescence. Parents provide structure within their homes as they establish expecta- tions for when certain things should occur (e.g., bedtime), rules for what behavior is expected, and discipline for when those expectations are not met. School provides a place for children to be at during certain times in a day and classroom policies/rules provide expectations for correct behavior. Extracurricular activities and employment also provide structure for adolescents as they are under the supervision of coaches, teachers, and employers. There is little, if any, time throughout the day, even if alone, that children and adolescents are not within the protective care afforded them by the structure of their lives. In theory, this structure is established to protect children, who may not yet have developed the cognitive, linguistic, social, moral, or emotional maturity (i.e., competence) to exercise complete autonomy. As those skills mature though, children and adolescents are given more and more autonomy commensurate with that maturity to make decisions for themselves.

Emerging adulthood (ages 18–29) becomes, for most young people, the first time in their lives when they are given almost complete autonomy on how to spend their time and who (if anybody) to spend it with. Indeed, a defining feature of emerging adulthood in most industrialized nations is the almost complete lack of structure afforded to young people. Thus, whether or not they actually have the maturity (cognitive, social, emotional, moral) to wisely exercise complete freedom over their choices, the third decade of life becomes a time during which young people have more control than ever before over the social milieu of their lives. Hence, the poten- tial exists for young people to immerse themselves daily in social interactions and relationships, withdraw almost entirely from them, or settle on something in between.

Taken together, studying concepts related to solitude (e.g., social withdrawal) may have particular relevance during emerging adulthood because of some of the unique features of the time period (e.g., autonomy, period of self‐focus and exploration) and because of some of the important developmental processes (e.g., identity development) that should ideally occur during this time. Thus, the purpose of this chapter is to provide: (1) a conceptual framework for the areas in which emerging adulthood may be unique in the life span for various elements of solitude (i.e., social withdrawal); (2) a review of literature for what is known about solitude, par- ticularly social withdrawal, in emerging adulthood; and (3) direction for future work that would enhance our understanding of the impact of solitude in the lives of emerging adults.

##### Emerging Adulthood

As noted, emerging adulthood is a time with very little structure. Demographic changes across developed countries in the past few decades have resulted in a period during which nothing is normative (Arnett, 2000; Nelson, 2020). The key demographic changes that have had the most significant impact on this decade of delayed adulthood and nonnormalcy are changes in trajectories of committed relationships and work. The median age of first marriage has continued to climb with the average age of marriage in 1996 being 25 for

women and 27 for men in the United States to it now being around age 30 for women and 32 for men across developed countries (OECD, 2019). In 1997, 75% of 30‐year‐olds had married. Today, however, 44% of men and 33% of women ages 30–34 have never married [(www.census.gov/newsroom/stories/2019/unmarried‐sing](http://www.census.gov/newsroom/stories/2019/unmarried)le‐ americans‐week.html). The need for – and increase in – attendance in postsecondary education means that financial independence from parents and the start of careers are being pushed back substantially. Indeed, across developed countries, more people are obtaining tertiary education or training well into their twenties, and finishing education is typically not followed by entry into a stable long‐term career, but instead, by years of frequent job changes and delayed career commitment (Bureau of Labor Statistics, 2019; OECD, 2019; U.S. Department of Labor, 2012).

These demographic changes have resulted in very little structure (i.e., increased instability due to little if any expectation for what, when, and how a person should be doing something) and in a shift in what many young people feel the third decade of life should be about. The majority of young people in Western, industrialized nations do not feel it is the decade to take on adult roles such as marriage, parenthood, and careers but instead believe emerging adulthood to be a period of self‐focus, exploration, and experimentation (Arnett, 2004). In many ways, young people now think that the third decade of life provides them the opportunity to do things that no other period in life will afford them. For example, Ravert (2009) asked young people what they feel they should do in their twenties because they would not be able to do them later in life after they had settled down as adults (i.e., “now‐or‐never‐ behaviors”). The most common theme that emerged was that the twenties should be used for travel/adventure, followed by social events, alcohol/tobacco/drug use, relationships (e.g., multiple sexual experiences), carefree lifestyle (e.g., being lazy, enjoying not having a real job), sports/action, academic/career (being able to change schools or change jobs), and independence/personal expression. Other research has shown that some young people think that this time of their life is to get an education, prepare to care for a family, and think about others (e.g., Nelson et al., 2015). In sum, the view that “nothing is normative” in emerging adulthood is due to the fact that there is little structure (e.g., parental rules, parent or teacher supervision, requirements to be in school) in the lives of young people and because of the wide range of views about how the third decade of life should be used.

Finally, it is important to understand one more significant aspect of emerging adulthood before turning our attention to how various factors related to solitude may influence the lives of emerging adults. Because there is no structure directing the lives of emerging adults toward a specific end, young people are left to make their own choices about how to direct their efforts and spend their time. As a result, whether the third decade of life becomes about flourishing or floundering often depends on the choices of emerging adults. It is also important to note here that many young people may not be able to delay adulthood and may find, among other things, that their educational and career choices are limited because they are unable to afford college, or must find a job quickly to provide the basics of life. As a result, many young people may experience emerging adulthood differently than is being described because their choices are limited by their circum- stances. That said, for many, especially those that are most frequently studied in psychological research, the reality is that the third decade of life is about choices related to exploration, experimentation, and delaying or preparing for adult roles.

Recently, the notion of *affordances* has been applied to emerging adulthood (Nelson, in press). The concept of affordances postulates that the “affordances of the environment are what it offers the animal, what it pro- vides or furnishes, either for good or ill” (Gibson, 1977, p. 127). For example, a chair affords sitting, a stove offers the possibility to cook, and beds afford sleeping. In applying it to emerging adulthood, it is important to think about what the time period *affords* young people as they transition to adulthood (Nelson, in press). Emerging adulthood affords young people the chance to explore their identity, get an education, build resumes, and, in general, prepare for future adult roles related to work and family life. However, emerging adulthood, with its lack of structure, likewise affords young people the chance to avoid growth‐promoting experiences in favor of risky and reckless behaviors (e.g., binge drinking, unprotected sex, driving while drunk, criminal activity) or behaviors that, while not directly harmful, may not lead to flourishing (e.g., video games; Nelson & Padilla‐ Walker, 2013). For example, in examining factors that are tied to flourishing and floundering, one study identi- fied a group of college students who were flourishing and two groups of students who were floundering,

composed mostly of men (Nelson & Padilla‐Walker, 2013). One group that was floundering exhibited very high levels of externalizing problems, such as binge drinking, drug use, risky sexual behaviors, and heavy violent video game use. Another group exhibited a lot of these same behaviors but also struggled with some problems of an internalizing nature such as low self‐esteem and depressive symptoms. Those young people who were flourishing in the study engaged in more prosocial behaviors, had positive relationships with others including parents, and saw the importance of preparing for adulthood.

If differing (positive and negative) trajectories can already be seen in the early twenties based on how young people are utilizing what the time period is affording them, it is possible to expect individuals will arrive in their thirties on very different trajectories of flourishing and floundering. Indeed, the way that the twenties are used may result in distinctly different long‐term outcomes in the areas of work, family, social capital, and overall well‐being. It is through this lens that we can start to examine how aspects of solitude may be related either to adjustment or maladjustment during the third decade of life, and possibly beyond. For example, if fear of social interaction keeps a person from pursuing a job or education, the potential for problematic outcomes may increase. A choice to isolate oneself from others in favor of inordinate hours of video game use would most certainly lead to different outcomes in the twenties than one who engages in solitary pursuits that are more productive (e.g., homework) or in more social, growth‐promoting pursuits (e.g., internship, volunteering). In sum, it is important to examine aspects of solitude in emerging adulthood through the lens of what the period of life affords young people and whether the respective aspects of solitude might be related to flourishing or floundering.

##### Social Withdrawal

Many aspects of solitude (e.g., loneliness) may be a part of the lives of emerging adults, but the aspect of solitude that we will focus on most is social withdrawal, specifically motivations to approach or avoid social interaction. The term *social withdrawal* is considered an “umbrella construct” capturing behavioral tenden- cies to consistently avoid and withdraw from familiar and unfamiliar peers (Rubin, Coplan, & Bowker, 2009). Over the years, researchers have used different approaches (e.g., personality, evolutionary, sociobiological, clinical) to study a variety of similar or related constructs, such as shyness, introversion, solitropic orienta- tion (i.e., desire to be alone), or affinity to aloneness. For example, Leary et al. (2003) examined how people who spend time alone often do so more of a desire to be alone (solitropic orientation) than a lack of a desire to be around others (sociotropic orientation). Other researchers have focused on various aspects of shyness including the emotional component of shyness (e.g., fear; “I feel tense when I am with people I don’t know well”; Mounts et al., 2006), the cognitions associated with shyness (e.g., “I feel painfully self‐conscious when I’m around strangers”; Melchior & Cheek, 1990), and the more behavioral components of shyness [i.e., employing items such as “talkative” (reverse coded), “quiet,” “outgoing” (reverse coded), and “shy”; e.g., Nelson et al., 2008].

Each of these examples capture slightly different aspects of what has been termed a “multifaceted” concept (e.g., Bowker & Raja, 2011), but many of them fail to capture the varying motivations connected to those emo- tions, cognitions, and behaviors in various types of social withdrawal. In other words, we feel there is a need to specifically examine subtypes of social withdrawal based on the various reasons (i.e., motivations) for why people choose to approach or avoid social interaction. It is important to understand motivations because they may be central in understanding why young people may or may not choose to engage in what emerging adult- hood affords them.

Most work on the social motivations underlying social withdrawal are informed by approach‐avoidance models. There are a number of different approach‐avoidance models, but we have chosen to examine motiva- tions via the lens of Asendorpf’s motivational model (Asendorpf, 1990, 1993), as it has been an influential conceptual model in the study of social withdrawal for over 30 years (see Nikiti & Schoch, Chapter 14 for another important motivational model). According to this model, *shy* individuals want to interact (high approach motivation) but simultaneously experience wariness, fear, and anxiety (high avoidance motivation). Others, referred to as *unsociable,* are believed to withdraw due to a low approach (but also low avoidance)

tendencies. In other words, they are not afraid of interacting and do not actively avoid others per se, but are simply less interested in *initiating* interactions with peers. Finally, some individuals actively *avoid* social interac- tions due to high avoidance and low approach motivations. Such individuals are believed to dislike social inter- action possibly due to previous peer rejection and exclusion (e.g., Bowker & Raja, 2011), emotional difficulties such as depression (e.g., Coplan & Armer, 2007; Coplan et al., 2013; Nelson, 2013), and/or high levels of fear and anxiety during social situations that may have “extinguished” their desire to approach others over time (Schmidt & Fox, 1999).

Taken together, employing approach‐avoidance models in the study of social withdrawal in emerging adult- hood is proving useful in further explicating that not all forms of withdrawal are necessarily evil (Rubin, 1982). Indeed, although nearly all of the work reviewed in subsequent paragraphs is correlational in nature, approach‐ avoidance models of withdrawal enable us to conceptually think about how young people may be approaching, or utilizing, opportunities that emerging adulthood affords them because of internal factors such as social motivations. In many important ways, these factors, and how they affect the choices young people make, may be tied to flourishing or floundering during the third decade of life.

##### Social Withdrawal and Emerging Adulthood

The heading for this section of the chapter is “social withdrawal *and* emerging adulthood” rather than “social withdrawal *during* emerging adulthood” for a specific reason. There are three different but equally important lines of research that describe the impact of withdrawal on development in emerging adulthood. First, there is a line of work trying to document stability and change in social withdrawal as young people enter and progress through emerging adulthood. In one cross‐sectional study of shy personality, Kwiatkowska and Rogoza (2017) found emerging adults to be more shy than adolescents. In another study examining the trajectories of self‐ reported social withdrawal (measuring a single dimension of behavioral withdrawal that included shyness, spending excessive time alone, and avoiding peer interaction) from 16 to 30, results showed that withdrawal decreases from ages 16 to 19 years, remains stable from 19 to 22 years, and increases from 22 to 25 years (Barzeva et al., 2019). Finally, in one of the few longitudinal studies (albeit short‐term) looking at *motivations*, it was found that shyness, unsociability, and avoidance are rather stable in emerging adulthood (Nelson et al., 2016). Taken together, while more longitudinal work is needed examining stability and change of social motivations, this work points to emerging adulthood as a developmental period marked by initial increases in social withdrawal, followed by more stability. Thus, it appears critical to examine why and how change and stability in social withdrawal may be related developmentally to what emerging adulthood is affording young people as they move through their twenties.

Second, there is a line of work that has attempted to understand how aspects of social withdrawal early in life (i.e., childhood, adolescence) predict outcomes in emerging adulthood. It is important to preface this by noting that none of these studies examine early motivations, but constructs that have been related to withdrawal (e.g., inhibition). For example, Caspi and Silva (1995) found that children rated high on shyness (i.e., behavioral inhibition) at age 3 scored low on measures of impulsivity, danger seeking, aggression, and social potency (i.e., forceful, decisive, fond of influencing others, and leadership roles; Caspi & Silva, 1995) at age 18. Other similar studies have found early shy/inhibited, fearful temperament to be linked to later introversion and cautiousness (Kagan & Moss, 1962), unassertiveness, depression, and fewer sources of social support during young adulthood (Caspi, 2000), and delayed entry into adult roles (e.g., marriage, parenthood, and stable careers; Asendorpf et al., 2008; Caspi et al., 1988; Kerr et al., 1996). More recently, there is work showing that shyness in adolescence is related to less full‐time work, lower income, poorer family functioning, more loneliness, and less self‐esteem in emerging adulthood and adulthood (Schmidt et al., 2017). Again, although the list contains seminal studies worthy of mention, this line of work has employed a wide array of constructs (e.g., shy personality, shy behavior, behavioral inhibition, broad assess- ments of social withdrawal) from a wide range of cohorts (i.e., some studies employed participants born in the mid 1900s) while failing to capture various withdrawn motivations. Thus, it is difficult to draw many conclusions other than to suggest generally that individuals who are socially withdrawn, especially fearful

and inhibited, as children and adolescents may enter the third decade of life already at risk for negative outcomes.

Finally, there is a line of research that examines the correlates and consequences of withdrawal *during* emerging adulthood. Indeed, although interesting and informative, the longitudinal studies reviewed previ- ously do not provide insight into how social withdrawal *during* emerging adulthood may affect the develop- ment of individuals currently *in* emerging adulthood. Specifically, it is important to examine the implications of various forms of withdrawal on individuals’ attitudes, beliefs, and behaviors in the context of the unique features afforded by the period of emerging adulthood. Therefore, the remainder of this chapter will focus specifically on the correlates and consequences of social withdrawal in emerging adulthood. It is important to point out from the outset that there is much more work examining shyness than either unsociable or avoidant motivations.

*Identity development.* A key feature of emerging adulthood is the opportunity it affords young people to form their identity. For successful identity development to occur, there should be a period of exploration followed by commitment (Erikson, 1968; Marcia, 1980). Solitude, generally, may play a positive role in the mental processes (i.e., contemplating, deciding) involved in exploring and committing (see Paulus & Kenworthy, Chapter 19). Alternatively, avoiding certain opportunities or contexts due to fear or dislike of social interactions may hinder or prolong processes involved in forming one’s identity. In fact, studies have shown that shy individuals tend to struggle with both identity exploration *and* commitment more than unsociable or non‐withdrawn emerging adults (Barry et al., 2013). In the area of career exploration, shy individuals report lower career identity levels and, in general, less mature attitudes toward career planning and exploration (Hamer & Bruch, 1997), and they engage in less career information‐seeking, are more undecided about a potential career, and express less interest in interpersonally oriented career fields (Phillips & Bruch, 1988). Other studies show that there may be some consequences of delaying career exploration and commitment, as shyness in emerging adulthood is related to less income, and less full‐time employment in adulthood (Schmidt et al., 2017), and more shy adults are found in unskilled labor than in higher paying white‐collar jobs (Van Zalk et al., 2017).

Taken together, this work suggests that for shy emerging adults, fear may interfere with healthy identity development. This may be because the exploration of one’s identity often occurs in social contexts. For exam- ple, to be able to settle on one’s occupational identity, emerging adults might need to explore by taking various college classes, participating in internships or volunteer experiences, or being employed in a variety of settings. To explore one’s relational, or sexual, identity (i.e., to whom one may be attracted, the kinds of sexual behaviors one enjoys, the ways in which a person is most comfortable expressing affection and love; Schwartz et al., 2016) it may be necessary to “hang out” and date. It may be a challenging task for a shy individual to repeatedly work up the courage to interview for employment opportunities, work in small groups in classroom settings, introduce themselves to new people at parties, or ask people out on dates. This would, in turn, limit their explo- ration and lengthen the amount of time before committing to an identity. In sum, shyness may be a risk factor in identity development in emerging adulthood because it appears to hinder both identity exploration and commitment.

Much less is known about the identity process as it relates to unsociability or social avoidance. The scant evidence that does exist suggests that unsociable individuals do not struggle in identity development. Barry et al. (2013) found that unsociable individuals did not differ from a social comparison group in identity exploration and reported higher commitment than both the comparison group and a shy group. Because they are not hampered by fear, there is less stopping unsociable individuals from being able to explore and commit to various aspects of their identity. In fact, future research might explore whether their ability to explore (i.e., because they are not hindered by fear) *and* spend time alone (allowing time for them to con- template the results of their exploration) might enable them to be particularly successful in taking advan- tage of what is afforded them in regard to identity development during this period of life. Future work also needs to examine whether the desire to avoid social interaction places avoidant individuals at particular risk in regard to identity development as no work has been done in this area. Indeed, given their dislike for

social interaction, and the link between social avoidance and indices of internalizing problems (e.g., depres- sion, suicidal ideation; Nelson, 2013), it would seem that there would be several hindrances to healthy identity development for avoidant emerging adults. Hence, the need for work in this area cannot be understated.

*Romantic relationships and sexuality.* Erikson (1959) suggested that the most important task of what he termed “young adulthood” is becoming capable of intimacy. Thus, he said young people have not reached maturity until they are able to form and maintain love relationships. Although most emerging adults no longer form long‐term, committed relationships until later in their twenties or early thirties, emerging adulthood nevertheless affords a period of exploration in more committed forms of relationships, as well as sexual exploration, than is typically experienced in adolescence. How emerging adults approach the opportunities afforded them in these areas has been linked to indices of adjustment and maladjustment.

Indeed, evidence suggests that the experience of shyness, unsociability, and avoidance is related to variance in whether withdrawn individuals are flourishing or floundering with regard to romantic relationships and sexuality. Though shy emerging adults typically *want* to participate socially, they are less likely to be in a roman- tic relationship, feel less competent in romantic relationships, engage in less dating, and report lower‐quality relationships with romantic partners than their non‐withdrawn peers (Barry et al., 2013; Leck, 2006; Nelson et al., 2008; Roswell & Coplan, 2012). If shy emerging adults have a desire for fulfilling romantic relationships, but avoid dating because of fear, especially fear of negative evaluation, or feelings of incompetence, they may miss experiences in relationships now which might hinder their abilities to form better quality relationships in the future. This may explain why shy individuals tend to experience lower quality romantic relationships not only in emerging adulthood (e.g., Nelson, 2013; Nelson et al., 2008) but in committed relationships (e.g., mar- riage) as (older) adults (Baker & McNulty, 2010; Luster et al., 2013; Tacket et al., 2013).

The result of not experiencing fulfilling romantic relationships in emerging adulthood may be reflected in shy individuals’ sexual behaviors as well. For example, for men, shyness has been associated with increased levels of masturbation and pornography use (Luster et al., 2013), suggesting that fear of social situations may lead shy young men to turn to solitary sexual behaviors as a potential substitute for exploring desired relational sexual behaviors. Although these behaviors may be normative in emerging adulthood, elevated levels of solitary sexual behavior may exacerbate existing nonsocial tendencies and/or relational deficiencies. Similarly, though not linked to more solitary sexual behaviors for women, shyness has been associated with less relational sexual behavior (e.g., intercourse), and fewer sexual partners (Luster et al., 2013).

Taken together, shyness appears to negatively impact experiences related to romantic relationships in emerging adulthood. At best, shyness may lengthen the time necessary to form healthy, committed rela- tionships, and at worst may create a significant barrier to healthy relational functioning in emerging adult- hood and adulthood. Future longitudinal work that extends from emerging adulthood into established adulthood will be necessary to understand the specific relational consequences of shyness during emerging adulthood.

Compared to their shy peers, *unsociable* emerging adults do not appear to fare poorly in romantic relation- ships. In fact, emerging evidence shows that unsociable young people do not differ from their sociable peers on reports of relationship quality (e.g., Nelson, 2013). Furthermore, unsociable emerging adults report stronger beliefs that their romantic relationships will last and purport higher feelings of self‐worth in romantic relation- ships than shy emerging adults (Barry et al., 2013). In regard to sexuality, for men, unsociability is associated with more relational (albeit risky) sexual behaviors (e.g., number of lifetime sexual partners), whereas for women, unsociability is associated with fewer relational sexual behaviors (e.g., lifetime sexual partners, rela- tional sex) but not associated (positively or negatively) with solitary sexual behaviors (Palmer‐Webb et al., in press).

In sum, it appears that unsociable emerging adults are experiencing much of what emerging adulthood affords them in regard to romantic relationships including reporting high‐quality romantic relationships. Unlike their shy peers who experience fear, unsociable individuals do not appear to be hindered in any way

from participating in aspects of life related to sex and romance when they choose to do so. In other words, having a motivational preference for solitude should not be mistaken for a motivation to avoid relation- ships. However, this does raise the question of whether a preference for solitude may lead to different ways of approaching sex and relationships in emerging adulthood. In this regard, what does exploration in rela- tionships look like for somebody who is not afraid of social interactions and does not actively avoid social interactions but, nevertheless, has a preference for solitude? There is still much that can be done in future research to examine the processes of how unsociable emerging adults are dating and forming romantic relationships.

Finally, the work examining romantic relationships and sexuality among avoidant emerging adults is sparse. It has been found that, like their shy peers, avoidant emerging adults report lower quality romantic relation- ships compared to unsociable and social emerging adults (Nelson, 2013). Furthermore, in examining links between avoidance and sexual behaviors, it has been found that, for women, avoidance was negatively associ- ated with relational sex and with risky sexual behavior (Palmer‐Webb et al., in press). The limited findings point to the need for more work that explores the lives of avoidant young people in this important domain of devel- opment during emerging adulthood. Conceptually (and supported by the limited data), it would stand to rea- son that having a low approach motivation coupled with a strong avoidance motivation would be a risk factor in seeking out, forming, and maintaining healthy relationships with a romantic partner but future research is needed to really explicate the attitudes, beliefs, behaviors, and processes involved with exploring and forming romantic relationships for individuals who are so highly motivated to avoid social interactions with others.

*Friendships.* There is a growing body of research showing that social withdrawal both influences and is influenced by peer relationships, including friendships, in adolescence (see Bowker, White, & Etkin, Chapter 10). Thus, it stands to reason that social withdrawal and peer relationships will continue to be related in important ways in emerging adulthood given the significant role of peers during the third decade of life. Specifically, emerging adulthood is a time of life when friendships typically take center stage over parent–child relationships, as young people spend increasingly more time with friends and increasingly less time with parents. This shift is compounded by the fact that many emerging adults move away from home to attend college, pursue jobs, or participate in military service, which requires relying more heavily on friends who are closer in physical distance. The instability of this stage of life may also mean that many emerging adults’ social circles are constantly changing (i.e., roommates moving in and out, classes changing each semester, coworkers coming and going) making it necessary to continually build new friendships in order to stay connected. Thus, because friendships provide a good deal of the social support afforded to young people in this stage of life, emerging adults who struggle to make new friends because of fear, or out of a desire to avoid social situations, may face additional challenges.

For instance, compared to their sociable peers, shy emerging adults report experiencing less affection in their friendships, less confidence that their friendships will last, and less overall satisfaction with their friendships (Barry et al., 2013; Nelson et al., 2008). However, having poorer quality friendships, generally, does not mean that shy emerging adults do not use friends as important forms of support. Research has shown that shy young people often rely on friends to act as “social surrogates” in unfamiliar situations to help facilitate social interac- tion and reduce stress (Closson et al., 2019). Whether this strategy is successful in helping shy emerging adults obtain the type of social interaction they desire has yet to be studied, but it does raise the question of whether effort and finding creative ways to build structure during a stage of life that otherwise offers very little structure can help shy individuals improve the quality of their friendships over time. Future work is necessary to further examine strategies that shy emerging adults may use to overcome their fear, and to determine whether those who actively seek out strategies and structure to help their social approach motivation “win‐out” fare better in their friendships than those who are more likely to give in to their avoidance motivation (i.e., fear).

On the other hand, friendships may look very different for unsociable and avoidant emerging adults who do not have the same approach‐avoidance conflict in social situations that shy young people do. In fact, unsociable

emerging adults report higher beliefs that their friendships are reliable than even their sociable peers, and do not differ significantly on any other indices of friendship quality (Barry et al., 2013). They also do not rely on friends as “social surrogates” like their shy peers (Closson, McVarnock, & Sanford, 2019). Taken together, these findings (albeit limited) suggest that, even in a stage of life filled with change and instability, unsociable emerg- ing adults are able to maintain the friendships that they need. Indeed, it may be that they simply prefer smaller gatherings over large social events, which allows them to focus their energy on building especially strong rela- tionships with specific individuals.

Conversely, avoidant emerging adults are similar to shy emerging adults in that they also report poorer quality friendships (Nelson, 2013), and recruit friends as “social surrogates” to facilitate social interaction (Closson et al., 2019). The key difference between the two, however, is that shy emerging adults seem to do this when they *want* to participate socially, whereas avoidant emerging adults recruit social help when they *have* to participate socially. Thus, friends may serve only instrumental purposes for avoidant emerging adults. Indeed, taken together, avoidant individuals appear to interact only when they absolutely need to (Closson et al., 2019) and struggle in relationships when they do (Nelson, 2013). Given the many benefits that friends appear to pro- vide (e.g., Furman & Burmeister, 1992) especially in emerging adulthood (e.g., Barry et al., 2009), it appears that avoidance may be a significant risk factor for floundering in emerging adulthood because avoidant individuals may not be pursuing, forming, or succeeding in friendships.

*Social interactions.* In addition to romantic relationships and friendships, the social interactions that emerging adults have with roommates, classmates, coworkers, and other peers may be indicators of whether or not young people are taking advantage of the opportunities afforded them in the third decade of life. Especially because friendships and romantic relationships often start out as casual interactions with roommates, classmates, and coworkers, the ability to interact and meet new people would seem very important during the third decade of life. There is scant research on social withdrawal in these very specific social contexts (school, work, living arrangements) during emerging adulthood. Therefore, in this section, we focus on discussing the ways that social withdrawal affects general social interaction more broadly during emerging adulthood to hopefully inform future research in these specific contexts.

For example, a growing body of research shows that shy emerging adults are often less socially accepted by peers (Nelson et al., 2008), and less likely to disclose their personal thoughts and feelings to others (Batool & Zubair, 2018; Matsushima et al., 2000). Because personal disclosure is a key factor in relationships with others (e.g., Luster et al., 2013), this may put shy emerging adults at a disadvantage from early on in their encounters with peers. Furthermore, FMRI and laboratory‐based work show that in conversations with a stranger, shy individuals report greater frequency of negative and anxious thoughts (especially for men), fewer positive thoughts regarding the interaction, more overt behavior signs of anxiety, an increase in somatic arousal, more time self‐focusing, and, in general, fewer vocal exchanges (Bruch et al., 1989; Melchior & Cheek, 1990). Shyness has also been associated with differences in brain structure that may indicate diffi- culties with emotion regulation during social interaction (Mao et al., 2019) as shy emerging adults use active attentional and cognitive control in response to threat, while their non‐shy peers use automatic emotion regulation (Tang et al., 2016).

Taken together, we see that shy individuals are experiencing social interactions in a much different way than their more social peers. Specifically, their social interactions are characterized by many more negative verbal exchanges, emotions, cognitions, and behaviors. The self‐focused, emotionally aroused, fear‐tainted lens through which they view basic social interaction may lead them to believe that their social interactions will be negative. This belief then introduces anxiety and discomfort into the interaction, making it more likely to actu- ally be a negative experience, which in turn, creates a self‐fulfilling prophecy that strengthens with every suc- ceeding negative interaction. When we understand this cyclical, internal process, it becomes easy to see how shy emerging adults’ difficulty interacting with others might lead to difficulty in forming high‐quality relation- ships. Hence, it will be important for future research to specifically examine how shy emerging adults are even

forming friendships and romantic relationships given the negative social interactions they tend to experience. Like during childhood and adolescence, it might be that shy emerging adults are able to find like‐behaved and like‐minded peers with whom to form relationships (see Bowker, White, & Etkin, Chapter 10). But no research to date has specifically evaluated this possibility.

In addition to the need for more work examining the social interactions of shy individuals, we need much more work examining the social interactions of unsociable and avoidant emerging adults. The limited work shows that, like in other domains, unsociable individuals appear to be doing comparatively well in social inter- actions. For example, like their social counterparts, high quantity and quality social interaction still seems to be an important predictor of the well‐being of unsociable emerging adults, though unsociable young people get a bigger boost in feelings of connectedness from deep conversation (Sun et al., 2019). Thus, again, unsociable motivations do not appear to be risk factors during emerging adulthood but more research is certainly neces- sary to fully understand how the interactions of unsociable emerging adults might be different (if at all) from those of social emerging adults and how their interactions might be tied to their ability to flourish during emerging adulthood and beyond.

Work is also needed to explore the ways in which desires to avoid and strong dislikes of social interaction may affect the actual social interactions that avoidant emerging adults do have and how that may be tied to floundering (most likely) during emerging adulthood. For example, the limited work that does exist shows that, as in other areas, avoidant individuals may be experiencing problems in their social interactions. For example, evidence shows that avoidance is linked to social anhedonia (or the inability to experience pleasure in social relationships and experiences) and to both physical and relational aggression in emerging adulthood (Bowker et al., 2017). These findings suggest that a dislike of social interactions may not only cause avoidant individuals to actively avoid social interactions, but also to engage in negative ways (e.g., aggression) when they do interact with others. Thus, that social interactions may be yet another area in which avoidant young people may be struggling during the third decade of life.

*Parents.* Contrary to views that would suggest that once young people turn 18 the work of parents is done, work has shown that the process of gaining greater autonomy, becoming more independent, and reaching greater self‐reliance does not occur in the absence of parents but in the “recentering,” or reorganization, of relationships with parents (Tanner, 2006). In other words, emerging adulthood affords the opportunity to recenter the parent–child relationship in a way that will contribute to the success and well‐being of the emerging adult. It has been found that emerging adults who are flourishing have high‐quality relationships with their parents (e.g., Nelson & Padilla‐Walker, 2013), which underscores the importance of the parent–child relationship during emerging adulthood.

There is not a lot of research on social withdrawal and the parent–child relationship in emerging adulthood, but what does exist suggests that shy and avoidant emerging adults may be struggling in their relationships with their parents. This is disconcerting given that, again, research shows that parents still matter in the lives of their emerging‐adult children (see Padilla‐Walker & Nelson, 2019). Specifically, research has found that, com- pared to unsociable and social peers, shy and avoidant young people have lower quality relationships with their parents (Barry et al., 2013; Nelson et al., 2008; Nelson, 2013). Also, shy individuals report less reassurance of worth (when asked questions such as “How much does this person make you feel admired and respected?”) from parents than their unsociable or non‐withdrawn peers, and less reliable alliance and affection from parents than unsociable emerging adults (Barry et al., 2013). Not only do unsociable emerging adults report more parental worth, reliable alliance, and affection than their shy peers, they do not differ from non‐withdrawn emerging adults in these areas or in parental relationship satisfaction (Barry et al., 2013). In sum, unsociability appears to be a rather benign form of withdrawal, but shyness is related to problems in the parent–child relationship.

However, beyond this emerging body of work showing that shyness and avoidance may be related to lower quality parent–child relationships, we know very little about why this may be. Specifically, we know little about parenting styles and practices that may characterize the parents of shy and avoidant emerging adults.

There is a body of work with children and adolescents showing that shyness is related to more oversolicitous, overcontrolling forms of parenting and that this relationship is bidirectional in nature (e.g., see Hastings et al., 2019 for a review). Thus, parents of shy emerging adults may be continuing to exhibit higher levels of control than is appropriate for this period of development, and it may be due to perceptions that the child needs their help. In the end, though, much more work is needed to truly understand the factors and bidirec- tional processes that would explain why shy and avoidant emerging adults appear to be struggling in the relationships with their parents. Furthermore, longitudinal work is needed to understand how these lower quality relationships may be associated with flourishing or floundering throughout emerging adulthood.

*Use of time: The case of media.* As noted, emerging adulthood affords young people the autonomy to choose how and with whom (if anybody) to spend their time. We know very little about how much time emerging adults spend in various activities and even less about how much time they spend in solitude. There are a few studies that have looked at correlates and predictors of time spend alone such as preference for aloneness (Coplan et al., 2019) and other motivations for time spent alone (Nguyen et al., 2019), but again not specifically on how much time emerging adults spend in solitude and what they are doing when alone. Hence, there is still much to learn about how emerging adults spend their time especially in the context of leisure. However, media is one topic that we might examine as an example of how choices regarding how the use of time may be tied to flourishing and floundering as it is a significant part of the lives of young people and an area in which there is a growing body of research regarding social withdrawal (see Burnell, George, & Underwood, Chapter 18; Kim, Chapter 17).

As with other forms of leisure (travel, drinking, sports), we need to consider both what the activity itself affords (e.g., harm, growth, health, fun, risk) and what the time engaged in that form of leisure is taking away from other activities. For example, watching a movie may not be harmful in itself but it may be taking away time that could be used to study for the next day’s exam. There is work (e.g., Nelson et al., 2016) that has dis- tinguished between *problematic media* (forms of media such as violent video games that when used in high amounts have been found to be linked to indices of maladjustment) and *connective media* (forms of media that have the *potential* to connect individuals to others such as e‐mail and social networking). Hence, it is through this lens (what the activity affords and what it is taking away from) that we might examine what is known about social withdrawal and media use.

Being able to connect with others via media may be particularly useful for some withdrawn individuals. However, research shows that shy, unsociable, and avoidant individuals differ in this regard. For example, shy emerging adults are less likely to post on social media about themselves or social events (Scott et al., 2018), but are more likely to use social media because of a belief that it is an important form of social connection (Brody, 2018). In this sense, shy individuals may think they are using media to connect, but their actual behavior (e.g., simply looking at social media but not interacting) does not connect them with other people. This may be a reason why shy individuals’ media use is related with indices of maladjustment. For example, a number of studies show shyness to be associated with internet (Ainin et al., 2017) and mobile phone addiction (Han et al., 2017) because of low self‐esteem (Gao et al., 2018), a desire to avoid loneliness (Ang et al., 2018), attach- ment anxiety, and low self‐control (Han et al., 2017). It is important to note that the majority of these studies are cross‐sectional and, therefore, conclusions regarding direction of effects cannot be drawn. Taken together, though, the evidence suggests that shy individuals may be using social media with the hopes of connecting but, just as in their face‐to‐face interactions, fear is keeping them from actually utilizing it to connect. Hence, it is possible that social media use is not only exacerbating internalizing problems (e.g., loneliness) for shy emerging adults but taking away from time that could be used in face‐to‐face contexts to develop social skills and build relationships.

On the other hand, longitudinal work shows that unsociability is not predictive of connective media use, whereas avoidance is negatively related to subsequent use of connective media (Nelson et al., 2016). These find- ings may suggest that, just as in live social interactions, unsociable young people may simply not choose to

initiate interactions (i.e., use connective forms of media; Brody, 2018), whereas avoidant individuals may actively avoid it. Because this is a limited body of work from which to draw many conclusions, there is a lot of work to do regarding how approach and avoidance motivations are related to media use specifically and leisure more broadly. However, emerging findings suggest that unsociable and avoidant individuals may not use social media as a way to connect with others. There is no evidence yet to suggest that there is harm in not attempting to connect with others via social media but not using one’s leisure use of media to connect with others may become a concern if that time is then spent engaged in problematic forms of media (see Kim, Chapter 17, for further discussion of the bidirectional links between problematic media use and factors such as loneliness, depression, and anxiety).

Indeed, in the same study looking at connective media use of withdrawn emerging adults, researchers looked at problematic media use (Nelson et al., 2016). It was found that the avoidant group played substantially more video games and violent video games, gambled (including online), and viewed more pornography, than shy, unsociable, or non‐withdrawn participants (who did not differ from one another). It is again important to note that these activities were categorized as “problematic” because each has been found repeatedly to be linked to indices of maladjustment when used in high amounts including increased aggression (e.g., Anderson et al., 2007), addiction to media (e.g., Schmitt & Livingston, 2015; Southern & Hilton, 2015), and decreased empathy and pro‐social behavior (Anderson et al., 2010; Linz et al., 1988; Padilla‐Walker et al., 2010). Hence, not only are avoidant individuals not attempting to use social media to connect, they are turning to forms of media that are problematic in nature, which may have a bearing on their developmental trajectories. Indeed, Nelson and colleagues found that problematic media use mediated the relation between avoidance at Time 1 and externalizing behaviors (e.g., illegal drug use, shoplifting) and depression a year later at Time 2. Furthermore, problematic media use at Time 1 predicted greater withdrawal at Time 2.

There are several important points to be drawn from this limited body of work. First, once again, it appears that unsociability is rather benign. Unsociable individuals may not be using media to connect but they are not, in turn, engaged in problematic forms of media at rates higher than their social peers. This raises the question for future work to examine how they are spending their leisure time but, at present, their use of media does not appear to place them at risk. Second, media use may be another aspect of avoidant and shy individuals’ lives that place them at risk for floundering. Indeed, the emerging evidence appears to support a rich‐get‐richer hypothesis that suggests that withdrawn individuals do not particularly benefit from media use (Kraut et al., 2002; Sheldon, 2008). This notion argues that media use benefits individuals who already have strong social skills and are confident in their interactions with others. Socially “rich” indi- viduals may use media as a way to reinforce their existing social skills and augment their already large friend- ship groups. Conversely, for the socially “poor,” online interactions cannot fully replicate face‐to‐face interactions, so the development of social skills is hindered. In other words, media use by withdrawn indi- viduals can become detrimental because the time that could be used to interact with others face‐to‐face is replaced or greatly reduced by the time spent using media. This, then, robs shy and avoidant individuals of opportunities to develop greater levels of social competence (Henderson & Zimbardo, 1998). This may be exacerbated even more if they then spend that time that could be used developing social skills in live interac- tions in use of problematic media that is linked to higher levels of withdrawal and indices of both external- izing and internalizing problems (Nelson et al., 2016).

In sum, there is much more to learn about the ways withdrawn emerging adults use their time especially in leisure and the example of media points to the need for this work to be done as it suggests that choices about how to spend one’s time can place one at risk if their leisure by nature is problematic, or if a choice about how to spend time in one area is taking away from time that could be spent on something better.

##### Indices of Well‐Being

Lastly, the instability in work, relationships, education, and residential status that is common in emerging adulthood (Arnett, 2004), leads to struggles in a number of areas for some young people, but once again that varies for socially withdrawn emerging adults. As in other areas of their life, unsociable individuals do not

appear to struggle amidst the instability of emerging adulthood. Specifically, although unsociability is related to some depression in emerging adulthood (Nelson, 2013), it is notably not significantly associated with internalizing problems such as loneliness or social anxiety. Furthermore, it is positively associated with numerous positive outcomes including creativity (Bowker et al., 2017) and indices of well‐being (Thomas & Azmitia, 2019). Conversely, compared to their non‐shy peers, shy emerging adults have more academic struggles (Hojat et al., 1988), experience greater loneliness in the transition to college (Mounts et al., 2006), and in general, report lower levels of happiness (Neto, 2001), well‐being (Hotard et al., 1989), religious strength (Barry et al., 2013), and self‐esteem and self‐perceptions (Nelson et al., 2008), as well as higher levels of anxiety, depression (Nelson et al., 2008), and risk of alcohol use disorder (Marsh et al., 2019). Given that shyness is linked to many of these indices of maladjustment, most of them of an internalizing nature, at earlier periods of development (i.e., childhood and adolescence; see Coplan, Ooi, & Hipson, Chapter 8; Bowker, Hope, White, & Etkin, Chapter 10), it is not likely that the instability of emerging adulthood is *causing* these problems but it is very possible that aspects of emerging adulthood (i.e., instability caused by loss of high school peer networks, new settings such as work and school, residential moves out of parents’ home) may be *exacerbating* some of the challenges facing shy young people. Future work needs to examine more closely which specific aspects of instability may be particularly challenging for shy individuals to navi- gate as they enter and progress through emerging adulthood. Work is also needed to examine how avoid- ance might interact with the instability of the time period to produce trajectories of flourishing or floundering during the third decade of life.

##### Longer‐Term Outcomes

The work examining social withdrawal during emerging adulthood has grown significantly in recent years but is nonetheless still in its infancy. Given there is so much more to learn about the developmental trajecto- ries of avoidant, shy, and unsociable individuals as they make their way through the third decade of life, it is to be expected that we know little about the long‐term outcomes of the trajectories of withdrawn individu- als as they leave the third decade of life and begin their thirties. However, emerging work examining adults in their early thirties has found that shy and avoidant individuals reported lower positive perceptions of themselves and their future, less satisfaction with life and relationships, and higher levels of internalizing problems and regret (Nelson et al., 2020). The work is not longitudinal so we cannot say for certain that individuals identified as shy, avoidant, or unsociable, respectively, in their thirties exhibited those motiva- tions in their twenties, but given the relative stability of these motivations (e.g., Nelson et al., 2016) there is reason to believe that the extent of regret, internalizing problems, lower life and relational satisfaction may be a reflection of choices made in the twenties that were influenced by fear or desire to avoid social interactions. Indeed, based on evidence that being fearful and withdrawn in one period of time (i.e., early childhood, childhood, adolescence) may be related to indices of maladjustment in emerging adulthood (e.g., Asendorpf et al., 2008; Caspi et al., 1988; Kerr et al., 1996; Kim et al., 2008), there is certainly reason to be concerned that being shy or avoidant in emerging adulthood will impact the trajectories of individuals as they enter their thirties.

##### Culture

It is important to note that most of the research reviewed in this chapter has been conducted with emerging adults from Western cultures (e.g., United States, Canada, Australia). However, without a doubt, future work needs to examine the role of culture when examining the links between social motivations and flourishing and floundering in emerging adulthood because the “meaning” of the various forms of social withdrawal may differ based on culture. For example, there may be some group‐oriented cultures in which withdrawing from the group for *whatever* reason might lead to negative feedback and disapproval and, subsequently, negative outcomes, whereas in other cultures the reasons for withdrawing and the behaviors that emerge from them may be favored as they might reflect some characteristic valued in the culture (e.g., modesty)

(see Chen & Liu, Chapter 6). For example, in comparing shy and unsociable individuals in South Korea and Australia, Kim and colleagues (2008) found that Korean adolescents who were shy and unsociable, respectively, showed better social and emotional adjustment in emerging adulthood than did their counterparts in Australia. This supports the notion that the meaning of withdrawal may differ depending on culture.

On the other hand, focusing on culture may also help us understand whether there might be some aspects of social withdrawal that are linked with indices of maladjustment regardless of culture because they hinder growth and development. For example, regardless of culture, if young people experience fear, they may inter- nalize negative thoughts and feelings about themselves and their abilities. Similarly, if fear or dislike of others keeps individuals from immersing themselves in social settings that are important for their development (e.g., education, work experience), young people may flounder regardless of culture. In support of this notion, shy- ness has been linked to internalizing problems in China (Gao et al., 2018; Nelson et al., 2015), interpersonal relationship (i.e., less likely to disclose their personal thoughts and feelings to others) in Pakistan (Batool & Zubair, 2018), and mobile phone addiction because of the mediating role of shyness with self‐control and attachment anxiety in China (Han et al., 2017). In sum, there is evidence that some aspects of shyness may pose problems to young people during emerging adulthood across cultures. Taken together, there is a need for more work that examines the relations between withdrawn motivations and various aspects of flourishing and floundering in various countries and cultures.

##### Conclusion

Throughout this chapter, we have attempted to underscore a need to examine social withdrawal through the lens of what the period of emerging adulthood affords young people. Some aspects of emerging adulthood afford opportunities to flourish, whereas others provide opportunities to flounder. Motivations to approach or avoid may play a role in the choices young people make from those afforded to them and, in doing so, place themselves at greater risk of floundering, or, in some cases, create better chances of flourishing. Indeed, many aspects of emerging adulthood may place a significant burden upon emerging adults to take the initiative upon themselves to take advantage of the good afforded by the time period (e.g., time and autonomy to explore one’s identity) while not being overwhelmed by some of the challenging aspects afforded by the time period (e.g., freedom to avoid growth‐promoting activities such as gaining an education). Taken together, the emerging evidence suggests that individuals who are hindered by fear, or who actively avoid contexts that require social interaction may be at risk for a myriad of negative outcomes during the third decade of life and potentially beyond.

Current and Future Paths in Research on Singlehood

The contemporary context of intimate relationships has been significantly altered (Mernitz & Kamp Dush, 2016) and it is now characterized by a great diversity of alternative forms of marriage and family life, including, among others, cohabitation and singlehood (Slany, 2006; Soons & Lief broer, 2008; Tymicki, 2016).\* At the same time, despite the heterogeneity of marital and family life forms, people generally still highly value the institu- tion of marriage (DePaulo, 2014; Willoughby et al., 2012), and the majority of young people expect to get married (Koropeckyj‐Cox, 2005). Although we live in “a society preoccupied with marriage, weddings, and couplings” (DePaulo, 2014), during the last 20–30 years we have noted the rising number of single adults in Europe and in the United States of America (Ochnik & Mandal, 2016) as well as in many Asian countries, including the largest region of Asia, i.e., Indonesia (Himawan et al., 2017).

The increasing rate of single individuals has undoubtedly fueled the interest of societal scientists in single- hood, although singlehood is not a contemporary phenomenon. For instance, in preindustrial societies, the phenomenon of singlehood pertained to eremites, shamans, changelings, and wanderers, who made a decision to abandon collective life, or singlehood was a result of circumstances independent of individuals, as in cases of expulsion, banishment, flight from persecutors, and catastrophes caused by the environment (Żurek, 2008). Traditionally, singlehood has been considered and analyzed in reference to family and marital unions (Żurek, 2008). This is not surprising, since in human history the preferable and the most acceptable form in which the course of human life took place was via participation in communities, of which the family was the most impor- tant group of social participation (Żurek, 2008).

The issue of singlehood is undoubtedly one of those social phenomena related to social and personal values as well as attitudes often characterized by strong and contrary emotions. This is not surprising, since the issue of singlehood pertains to one of the most intimate aspects of our lives (i.e., having or not having a lifetime partner/spouse). Regardless of the results of the empirical, objective, and scientific studies in this area, there may always be people who will hold various, often contradictory, points of view on singlehood. On the one hand, we will meet with claims that singlehood is a detrimental situation for human develop- ment, and that single people are miserable or unhappy. On the other hand, others will claim that singlehood can be embraced and fulfilling, and that some single people can be recognized as “singles at heart” (DePaulo, 2014). As a result of this ambivalent evaluation of singlehood, it is extremely important to present the results of empirical research, as well as scientific and public debates on singlehood, in a transparent and reliable manner.

Accordingly, the goal of this chapter is to present the current knowledge on singlehood from a psychologi- cal perspective, with the formulation of some anticipated directions for future research in the discipline of psychology. Naturally, singlehood represents a phenomenon that is determined by multiple factors involving social, cultural, demographic, religious, and psychological ones, and which is also related to various life

outcomes involving diverse spheres of life (DePaulo, 2014; DePaulo & Morris, 2005; Żurek, 2008). Therefore, the concentration on selected factors or employment of a certain view of singlehood will always be a presen- tation of one possible perspective. Specifically, this chapter will start with a brief elaboration of definitional issues of singlehood. Subsequently, this chapter will present several major past and current lines of research on singlehood (i.e., the reasons for singlehood, the link between singlehood and loneliness and mental health), which will be simultaneously treated as a starting point for the formulation of anticipated future directions in the domain of singlehood.

##### Conceptualizations and Definitions of Singlehood

The considerations of the definitional issues pertaining to singlehood require, in the first place, to acknowledge the heterogeneity of single people. Undoubtedly and clearly, this heterogeneity is related to formal civil status, which, to some degree, may reflect the reasons why an individual remains single (i.e., due to being never‐mar- ried, due to divorce, or due to widowhood) (DePaluo & Morris, 2005; Stein, 1981; Żurek, 2008). This recog- nized diversity, however, involves not merely civil status and different relational experiences, but also the multiple pathways leading to long‐term singlehood (Pepping et al., 2018), and other factors such as sexual ori- entation, age, educational level, income, place of residence, living arrangement (i.e., living alone or with some- one), and having or not having children (Stein, 1981).

Bearing in mind the above indicated heterogeneity of single people, it is not difficult to notice that the com- monly used term *single* may not reflect the variety of circumstances contributing to singlehood, the temporal features of single status, or whether a single person lives on his/her own or in an economic and housing com- munity with relatives and nonrelatives (Żurek, 2008, 2016). Even if we agree that the term *single* does not take into account the heterogeneity of single people, and does not specify what type of relationship (love, peer, parental, etc.) single people do not have (Clark & Graham, 2005), the need for a definite theoretical framework of the term *single* is clear and understood. Indeed, researchers from various scientific disciplines take very different points of view and propose various definitions of this construct. The presentation of all definitions of singlehood provided in the literature would not be possible here. Thus, I will only refer here to certain major considerations. However, readers are encouraged to review the seminal paper “Singles in Society and in Science” (DePaulo & Morris, 2005), in which comprehensive reflections on the definition of singlehood are provided.

The classical definition of a single person was provided by Stein (1976), who stated that a single person is a woman or man who is not in a hetero‐ or homosexual marital or informal relationship. DePaulo and Morris (2005) later made an additional distinction between the legal versus social understanding of a single person. The authors indicated that from the legal perspective (i.e., referring to civil status), a person who is not in a marriage is single, whereas from the social perspective, being single refers to the subjective evaluation of an individual as a person who is not in a serious relationship. This social perspective seems to be adopted by singles themselves. For example, most U.S. single respondents tend to define being single as a state of being unmar- ried, uninvolved, or a state of not having a significant other (e.g., “being single … means that you are not exclu- sively seeing anyone; when you start dating only one person, you are no longer single”) (Darrington et al., 2005, p. 650). Reference to the social perspective can also be noted among Polish single young adults, who used dif- ferent terms to define their single status, such as “I am free,” “I am alone,” “I have no boyfriend/girlfriend,” and, finally, “I am a single” (Palus, 2010).

Although potentially very useful, the legal and social perspectives represent only a general notion and do not provide strict criteria indicating, for instance, what exactly a serious relationship means, who the partner is whose single people do not have, and after what time a person can be considered single. The first issue was raised by the present author in an article presenting attempts to define the term *lifetime partner* (Adamczyk, 2015). These efforts included theoretical considerations pertaining to the psychosocial theory of E. H. Erikson (1982) and theory of romantic attachment (Hazan & Shaver, 1987; see also Mikulincer, Shaver, & Gal, Chapter 3), in combination with results obtained from a qualitative study of 386 Polish individuals (aged 18–33 years). Arising from this work, the term *lifetime partner* was defined as a person “with whom one maintains a relationship

characterized by psychological and physical closeness, which is not only to satisfy the need of having a partner, but also whose needs are satisfied; he/she is a lifetime companion in the context of marital life and/or life in a nonmarital relationship. The term *lifetime partner* is therefore not identical with the term *husband*/*wife*, although a spouse is a lifetime partner” (Adamczyk, 2015, p. 319).

With regard to the fundamental issue of *duration* of singlehood, Schachner et al. (2008) conceptualized a single person as “not in a committed relationship for the past three or more years and not likely to become committed in the near future (within the next year or so).” Naturally, for some people, the period of being single is only a certain stage before engaging in a long‐term relationship and/or marriage (Kaiser & Kashy, 2005). For others, the lack of a partner can be a prolonged state by choice or, for a variety of rea- sons, against their will (e.g., Braun‐Gałkowska, 1989). Therefore, the issue of time after which a person can be considered single seems to be rather a question of debate and a result of arbitrary decisions. For exam- ple, in other studies (e.g., Adamczyk & Segrin, 2015a, 2015b) a single person was conceptualized as some- one who has not had a lifetime partner for at least six months but would like to have a lifetime partner in the near future. Importantly, this definition includes: (1) an indication of what kind of person a single individual lacks; (2) a minimum duration of remaining single; and also (3) the dimension pertaining to desire versus the lack of desire to have a partner. This last dimension is not novel in the considerations of typology in the literature on singlehood. Specifically, based on such dimensions as desire versus the lack of desire to have a partner and attitudes toward singlehood (negative vs. positive), Van Hoorn (2000) distin- guished four types of single individuals: (1) satisfied singles, who want to remain single and who have a positive attitude toward single life; (2) ambivalent singles, who want to have a partner, but who at the same time hold a positive opinion about single life; (3) longing singles, who want to have a partner and who are critical of single live; and (4) regretful singles, who want to remain single and have a negative attitude toward singlehood.

Taken together, it seems clear that definitions of the term *singlehood* are as diverse as the category of single individuals itself. Therefore, it may not be possible (or even critical) to indicate a single definition of singlehood and/or to reach a consensus by researchers. However, a reasonable solution for researchers seems to be to indicate which definition of singlehood they employ in their studies or when making theoretical reflections. Accordingly, the selected definition should be based on the purpose of the study undertaken, and to every extent possible, include the most essential aspects (i.e., specification of what kind of relationship a single per- son lacks, the duration of singlehood assumed in the study, and whether a single person expresses a desire to have a partner or not). As such, even if we are not able to formulate one commonly accepted definition of singlehood, we can make every effort to ensure that our understanding of a single person is accurate to the highest degree and that the definition criteria are transparent to others.

##### Reasons for Singlehood

Having established the diversity and complexity of the various potential *reasons* for singlehood, it is perhaps not surprising this issue is the most widely investigated in the extant literature and across a range of disciplines. Reasons for being single are inextricably related to outcomes associated with singlehood. In short, and as it will be demonstrated in the following sections, different types of reasons for being single are linked with a wide range of outcomes (Reynolds et al., 2007).

Historically, psychological research conducted in the 1980s and 1990s noted three main reasons for being single: (1) personal choice; (2) external circumstances; and (3) personal deficits (e.g., Austrom & Hanel, 1985; Frazier et al., 1996). Although it may be difficult to make a clear objective or subjective distinction between these categories (they seem to be rather interwoven), undoubtedly some individuals *choose* single- hood and prefer such a lifestyle (Lewis & Moon, 1998). At the same time, others cannot find a partner due to real or imagined reasons, although they desire to have a partner (Lewis & Moon, 1998). These individuals may perceive their single status as a consequence of some *external circumstances,* including, for instance, the failure to meet the right person (e.g., Austrom & Hanel, 1985; Darrington et al., 2005; Żurek, 2008), or unre- quited love (Palus, 2010).

Reynolds et al. (2007) addressed the seminal notion of the role of personal choice versus the lack of personal choice with regard to singlehood. These authors suggested that individuals who represent themselves as having made a choice to be single, and for whom having an intimate relationship is not a central goal in life, may not feel that they have failed to achieve this goal. In contrast, individuals who want to be committed in a serious relationship, may have to deal with a sense of failure in achieving this goal, and they may attribute themselves less agency than those who chose to remain single. Accordingly, it can be postulated that when singlehood is perceived as a result of an individual’s choice and decision, and is congruent with an individual’s needs and desires, it is not related to negative life outcomes, whereas when singlehood is perceived as a situation caused by factors beyond an individual’s control, it may be related to negative life outcomes.

These claims are also supported, for instance, by the results of studies in the domain of *solitude*. That is, motivation for solitude is recognized as a factor affecting subjective well‐being in the context of solitude (see Nguyen, Ryan, & Deci, Chapter 16). Specifically, when people are forced to spend time alone, they experience increased loneliness and decreased life satisfaction, whereas when people autonomously engage in solitude, they do not report such outcomes (Chua & Koestner, 2008). Autonomy with regard to solitude appears to play a buffering role for the negative effects of solitude on well‐being, as well as having beneficial effects of solitude on relaxation and stress levels (Nguyen et al., 2018).

Similarly, it is not difficult to imagine that a situation in which an individual remains single against his/her will and desires to have a partner may be related to negative outcomes. For instance, when an individual desires to have a partner/spouse but remains single, he/she may experience ambiguous loss (i.e., a situation in which a partner/spouse is psychologically present although physically absent) ( Jackson, 2018). As a result, an indi- vidual may face the loss of a relationship with a nonmaterialized, anticipated partner/spouse and sustain the hope for finding the partner/spouse, which in turn, hinders the process of closure and healing of the loss ( Jackson, 2018). In contrast, it is easy to imagine a different scenario in which an individual remains single, does not desire to change their single status, and is satisfied with his/her single status.

There is some initial empirical support for these. Adamczyk (2019) recently reported that single adults who often and always expressed preference for an alternate relationship status (i.e., the preference to transit to a partnered status) also reported the lowest level of satisfaction with their single satisfaction, as compared to singles who sometimes and seldom expressed such a preference. Since this study was correlational in nature, alternative interpretations of this association must also be considered. For example, single individuals who are satisfied with their single status may simply be less likely to prefer a change in status. Additionally, Adamczyk (2017c) found that voluntarily single young adults reported significantly lower romantic loneliness than invol- untarily single young adults, However, these two groups did not differ with regard to emotional, psychological, and social well‐being, as well as somatic symptoms, anxiety, insomnia, social dysfunction, severe depression, and total mental health/illness.

Notwithstanding, differential outcomes associated with voluntary versus involuntary singlehood may extend beyond well‐being or romantic loneliness at an individual level. For example, there may also be implications for the social perception of single individuals. That is, singles who choose to remain single and who reject marriage appear to be perceived more negatively (i.e., as more self‐centered and less well‐adjusted) than married people, and may also be more negatively perceived than single people who want to marry (Morris & Osburn, 2016). This negative perception of single individuals who decide to remain single may reflect its view as a negation of a commonly held ideology of marriage and family, and as a rejection of the highly valued and desired institu- tion of marriage (Haidt, 2001).

*Personal deficits* constitute the third category of circumstances typically associated with singlehood. One personal deficit often indicated by single adults in prior research is *shyness* (Darrington, Piercy, & Niehuis, 2005; Palus, 2010, see also Nelson & Millet, Chapter 11). Shyness encompasses feelings of social fear, anxiety, and fear of negative evaluation, which may be an obstacle to social functioning and may involve withdrawal from interpersonal contacts, and difficulties in establishing and maintaining social contacts (Argyle & Domachowski, 1994). Indeed, in a study of Greek participants, Apostolou (2017) reported that difficulties with relationships (including being shy and lacking confidence) emerged as one of 76 identified reasons for remaining single.

Another personal deficit reported by single individuals is a sense of physical or social unattractiveness (Darrington et al., 2005; Palus, 2010). The role of physical factors was also mentioned by participants in a study on involuntary celibacy in which individuals indicated their weight, appearance, and physical characteristics as factors that make them less attractive to potential partners (Donnelly et al., 2001). When considering these issues, some authors have pointed out that a small number of people simply look at themselves for reasons for their lack of a partner (e.g., in the traits of their character, physical attractiveness, complexes, or inability to initiate closer contacts) (Gajda, 1987). On the other hand, others have recently suggested that some people are assumed to remain single due to the possibility of increasing their future mating success or due to traits hinder- ing the ability to attract a potential partner (Apostolu, 2017). These notions have been proposed by evolution- ary psychologists, who suggested that – considering the evolutionary importance of attraction and retaining mates and passing genes to future generations – the occurrence of involuntary singlehood should be low (Apostolou et al., 2019).

In line with the evolutionary perspective, since people are interested in the achievement of their reproduc- tive success or fitness, being single would represent a situation that might hinder an individual’s chances of his/ her reproductive success (Apostolou, 2017; Apostolou et al., 2019). If so, certain mechanisms preventing people from remaining without a mate can be expected to exist (Buss, 2017). At the same time, in some cases, remain- ing single may be paradoxically *beneficial* for people. For example, being single could result in an increase of fitness during this period through the acquisition of various resources required to attract a mate, as well as the alteration of traits (e.g., a serious illness, personality traits) involved in sexual functioning, flirting, and approach- ing mates (Apostolou, 2017).

The evolutionary perspective may become a new path in research in the domain of singlehood, which until today has been almost exclusively dominated by the perspectives of family and human development psychology. The importance of the evolutionary perspective may derive from explanations of singlehood in reference to universal mechanisms of mating selection and mating performance. In this regard, single and coupled individuals may be directly compared. At the same time, linking involuntary singlehood to poor mating performance (Apostolu & Wang, 2019) brings some potential risks related to the possibility of *stigmatization* of single people, and employing the “pathologizing deficit perspective of singlehood” ( Jackson, 2018). From this perspective, single individuals are perceived as having certain deficits (e.g., in the domain of mating strategies and mating performance) that undermine their possibilities of finding a part- ner and establishing a relationship.

Moreover, both single individuals and others tend to attribute reasons for being single to some negative fea- tures of single individuals’ personality and physical appearance (DePaulo & Morris, 2005; Morris & Osburn, 2016; Ochnik & Mandal, 2016). For instance, in a Polish study, married women indicated that selfishness and the lack of ability to seduce men were the factors contributing to unmarried women’s single status (Grzeszczyk, 2005). The tendency to connect reasons for remaining single with an individual’s personal deficits may, in turn, help to explain why others are more likely to refer to internal factors rather than external ones in attempts to explain other people’s behaviors (Ross, 1977). As it has been illustrated in the literature, “we may attribute someone’s failure to marry to a flawed personality which makes them less desirable as a spouse. For example, we may assume that singles are self‐centered or not well‐adjusted because these stereotypes provide a simple explanation as to why they have not yet married” (Morris & Osburn, 2016, p. 150).

In summary, a review of the literature clearly demonstrates that there are multiple reasons and pathways leading to singlehood. Undoubtedly, in some cases, it is possible to speak of a conscious and voluntary choice to remain single (Braun‐Gałkowska, 1989; Gajda, 1987), whereas in other cases, external factors or necessity can be seen as contributing to singlehood (e.g., death of the partner/spouse, abandonment, unrequited love, unfavorable family arrangements, being in an environment where it is difficult to find suitable candidates for a relationship and marriage) (Braun‐Gałkowska, 1989; Palus, 2010). At the same time, the issue of choice versus the lack of choice to be single is not a stable set of circumstances that are not subject to change (Reynolds et al., 2007). Therefore, future research might consider the recognition of voluntary versus invol- untary singlehood not as a dichotomous category, but rather employ a continuous approach to the issue of choice versus the lack of choice in the domain of singlehood. In this regard, the concept of voluntary versus

involuntary singlehood could be viewed, for instance, in terms of primary and secondary control and locus of control (Rothbaum et al., 1982; Rotter, 1966).

##### Loneliness and Singlehood

According to social opinion and in stereotypical beliefs, singlehood has been often identified with loneli- ness, social isolation, the lack of social support, and unhappiness (Czernecka, 2008; DePaulo & Morris, 2005; DePaulo, 2014; Greitemeyer, 2009). Indeed, prior research provided evidence that the lack of a cer- tain specific type of relationship in social networks may contribute to feelings of loneliness (Dykstra & Fokkema, 2007). For instance, on average, married individuals have been found to be less lonely than unmarried individuals (Tornstam, 1992), and living with a partner predicts the lowest levels of loneliness (de Jong‐Gierveld, 1987), including romantic loneliness (Bernardon et al., 2011). Moreover, recent research has shown that changes in relationship status may also be related to changes in romantic loneliness (Adamczyk & Segrin, 2019). Specifically, the transition from partner status to single status over a period of 12 months has been found to be associated with increased romantic loneliness, whereas the transition from single status to partnered status has been associated with decreased romantic loneliness during the 12‐ month interval (Adamczyk & Segrin, 2019).

Although the lack of romantic partners or intimate relationships may be an important perceived causal factor in one’s present feelings of loneliness (Rokach & Brock, 1998; Russell et al., 2012), loneliness does not necessarily affect all life spheres, and it may be related only to a specific domain concerning having a partner/spouse. This notion has contributed to the acknowledgment that single individuals do not necessarily have to be lonely people, and they do not have to experience a generalized feeling of loneliness in their lives. Indeed, research from more than 20 years ago already showed that being involved in a romantic relationship was significantly related to lower levels of romantic loneliness, but was only weakly linked to family and social loneliness (DiTommaso & Spinner, 1993). Also, more recent studies have raised the issue of the link between singlehood and loneliness pertaining to various life domains (Adamczyk, 2016; Adamczyk & Segrin, 2015a). For instance, in a study of 315 Polish adults, single individuals were found to report higher romantic and family loneliness than partnered individuals, but no differences emerged in the domain of social loneliness (Adamczyk, 2016). Moreover, in the same study, duration of singlehood was a significant predictor of romantic loneliness (i.e., longer duration of singlehood was related to higher romantic loneliness among single individuals) (Adamczyk, 2016).

To sum up, results from previous studies suggest quite unequivocally that “a lack of certain types of rela- tionships within a person’s social network may result in feelings of loneliness” (Dykstra & Fokkema, 2007, p. 2). At the same time, although the lack of a romantic partner and a romantic relationship may be an impor- tant source of loneliness (e.g., Qualter et al., 2015), future research would benefit from concentration on the mechanisms explaining the link between single status and romantic loneliness, as well as factors that could mitigate the negative effects of single status on loneliness. Some preliminary research has already been initi- ated in this area. For instance, Adamczyk (2016) reported that although the prolonged duration of single life was related to increased loneliness, this negative effect was mitigated by high perceived social support from family and moderate support from significant others. In other words, despite a prolonged period of remain- ing single, the level of romantic loneliness may decrease when single individuals perceive their families to be highly supportive and their significant others as supportive to a moderate degree. Importantly, it may be that support from significant others operates differently than family support, since it is related to a more voluntary and transient nature of relationships. Therefore, single individuals may feel particularly vulnerable to the character and amount of support from significant others, and may feel that other people (significant others, but not a romantic partner) are too much engaged in their single life, which deepens their romantic loneliness (Adamczyk, 2016). Furthermore, another factor that may potentially play a buffering role in the link between singlehood and loneliness is satisfaction with single status. There are some initial findings showing the exist- ence of a strong negative relation between satisfaction with relationship status and romantic loneliness (Adamczyk, 2016; Adamczyk et al., 2019; Adamczyk & Segrin, 2019). In other words, the more people are satisfied with their relationship status (regardless of whether it is a partnered or single status), the less they

experience romantic loneliness. The construct of satisfaction with relationship status seems to constitute a promising and important line of further research on singlehood and coping with loneliness as one of the pos- sible life outcomes.

##### Mental Health and Singlehood

The importance of relationships for people’s mental and physical health has also been well documented in the literature (Carr & Springer, 2010). A review of the literature indicates that married people report lower rates of mental illness and greater happiness in comparison to unmarried, divorced, separated, or widowed individuals (Diener et al., 1999; Soons & Lief broer, 2008). Single individuals have also been found to report higher levels of depression, anxiety, mood disorders, adjustment problems, and alcohol‐related problems compared with married individuals (Braithwaite et al., 2010). With regard to positive indicators of mental health, young Polish adults in nonmarital relationships report higher levels of emotional well‐being (EWB) than single individuals, but with regard to social and psychological well‐being (PWB), partnered and single individuals do not differ from each other (Adamczyk & Segrin, 2017a). Specifically, considering the content of the Mental Health Continuum – Short Form’s items employed in the cited study, we may state that individuals in relationships more frequently report the feelings of being happy, interested in life, and satisfied with life than single individu- als. Research devoted to emotional well‐being reflects the hedonic tradition in capturing subjective well‐being (Keyes & Simoes, 2012), which “is achieved through the pursuit of pleasure, enjoyment, and comfort” (Huta & Ryan, 2010, p. 736). Thus, in light of the cited study, having a partner might be recognized as one of the factors providing individuals with pleasure, enjoyment, and comfort, and, as a result, contributing to the higher well‐ being among coupled individuals. In turn, at least in the study on young adults cited here, the lack of a partner and having a partner did not affect people’s psychological well‐being, that is, their self‐acceptance, personal growth, purpose in life, positive relations with others, autonomy, and environmental mastery, or people’s social well‐being, involving social integration, social contribution, social coherence, social actualization, and social acceptance.

Although the importance of relationships for people’s well‐being has been extensively investigated (Lyubomirsky et al., 2005), the well‐established link between marital or relationship status and well‐being has recently come into question. Lehmann and colleagues (2015) introduced a new theoretical construct termed *satisfaction with relationship status* (or *status satisfaction*), which is defined as being satisfied with one’s current relationship status (either having a partner or not). In their original study, Lehmann and colleagues (2015) showed that satisfaction with relationship status had greater explanatory value in predicting well‐being (as measured in terms of life satisfaction and psychological distress) than marital status. In other words, the authors demonstrated that relationship status (i.e., having a partner/spouse or not) was not an important factor pre- dicting satisfaction and psychological distress among single and partnered individuals, whereas satisfaction with having a partner or not was.

These promising findings were successfully replicated in subsequent studies. For instance, Adamczyk (2017a) found not only that satisfaction with relationship status (but not relationship status itself ) was predictive of life satisfaction, emotional and psychological well‐being, and depressive symptoms, but also that satisfaction with relationship status (but not relationship status) significantly predicted life satisfaction eight months later. Moreover, in a very recent investigation, *changes* in relationship status were related to changes in satisfaction with relationship status over time (Adamczyk & Segrin, 2019). Specifically, individuals who had a partner at Time 1, but who became single before Time 2, reported lower satisfaction with relationship status at Time 2 (12 months later). In turn, individuals who were single at Time 1, but became partnered before Time 2, reported higher satisfaction with relationship status at Time 2.

To sum up, these results suggest that since the construct of satisfaction with relationship appears to have a greater explanatory and predictive function than relationship status alone, it should not be omitted in our future considerations of the link between relationship status and health outcomes. This sets a new direction for research focusing more on the subjective experience rather than the objective fact of having a partner/ spouse or not. Once again, the results from research on status satisfaction have provided evidence that life

circumstances such as income, marriage, number of friends, and children are relatively modestly associated with happiness (e.g., Kaczmarek, 2016), and that being in possession of one of these “goods” (i.e., a partner) may be less important for mental health than the degree to which an individual is satisfied with having or not having a partner.

Researchers planning further studies may consider the analysis of predictors of status satisfaction among sin- gle and partnered individuals. However, it also remains crucial to explore factors that may enhance and maintain high satisfaction with single status among single individuals. Finally, research examining outcomes potentially related to status satisfaction should extend beyond indices of mental health, and consider other constructs such as loneliness, choice or the lack of choice of singlehood, or coping strategies with singlehood.

##### Fear of Being Single and Singlehood

Spielmann and colleagues (2013) introduced a new construct termed *fear of being single,* which is defined as “entailing concern, anxiety, or distress regarding the current or prospective experience of being without a romantic partner” (Spielmann et al., 2013, p. 1049). Despite the term’s predominant connotations with single- hood, fear of being single may manifest itself both among single as well as partnered individuals (Spielmann et al., 2013). Results from a subsequent study indicated that fear of being single was positively associated with dependence on less satisfying relationships and longitudinally predictive of the initiation (or lack thereof ) of breakups of relatively less‐satisfying relationships (Spielmann et al., 2016). Furthermore, fear of being single was also a positive predictor of feelings of love and longing for ex‐partners. Finally, individuals who reported higher fear of being single after a breakup and those who in general experienced stronger fear of being single also reported greater longing for ex‐partners and were more likely to attempt to reestablish broken relation- ships (Spielmann et al., 2016).

Fear of being single has been described as “an important, unique predictor of romantic outcomes.” (Spielmann et al., 2016, p. 8). However, results from the few subsequent studies of this construct revealed that single individuals experienced similar levels of fear of being single as individuals in relationships, and that vol- untarily single individuals were characterized by lower fear of being single in comparison to involuntarily sin- gles (Adamczyk, 2017b; Adamczyk et al., 2019). Moreover, among single individuals, fear of being single was negatively associated with satisfaction with single status (Adamczyk et al., 2019).

Adamczyk (2017b) explored the theoretical significance of fear of being single in explaining the mechanism linking relationship status and mental health outcomes. A conceptual model was tested in a sample of 556 Polish participants aged 20 to 35 years, with satisfaction with relationship status and fear of being single as serial mediators of the links between relationship status and well‐being. Results revealed support for the pro- posed links between relationship status and indices of well‐being (life satisfaction, emotional and psychologi- cal well‐being, and depressive symptoms) that were reflected in the serial mediation of both satisfaction with relationship status and fear of being single. More specifically, partnered individuals experienced higher status satisfaction than single individuals, which in turn was associated with lower fear of being single, and this lower fear of being single translated into higher well‐being. Additionally, the indirect effect of relationship status on well‐being through satisfaction with relationship status was larger than its indirect effect through satisfaction with relationship status and fear of being single operating in serial. This pattern of results may suggest that in the prediction of well‐being, appraisals/attitudes toward one’s current relationship status (reflected by satisfaction with this situation) may play a greater role than the combined operation of status satisfaction and fear of being single.

Taken together, these results suggest that fear of being single may play a significant role not only in the domain of relational outcomes among partnered individuals, but also as with regard to outcomes related to singlehood. Therefore, a natural direction of future research seems to be a continuation of this research line. More specifically, future studies may consider investigating several predictors of fear of being single among individuals who do not have a partner and those who have a partner, and determining the devel- opmental specificity of fear of being single as related to age and belonging to various developmental periods of life (an exemplary question is whether fear of being single increases or decreases with age), as

well as its characteristics among individuals representing various relationship status (i.e., never‐married adults, divorced, and widowed individuals). Finally, further and deeper investigation is required into the issue of outcomes of fear of being single among single individuals (e.g., the link between fear of being single and the activity aimed at finding a partner). In other words, an interesting question is whether fear of being single may motivate people to instigate an intensive search for a partner in order to attempt to reduce this fear.

##### An Attachment Model of Long‐Term Singlehood

Researchers have long been interested in examining singlehood from the perspective of attachment theory. Results from several previous studies have already indicated links between aspects of attachment and single- hood. For example, Kirkpatrick and Hazan (1994) demonstrated that securely attached adults at the time of the initial survey were the most likely to be married and the least likely to be separated or divorced four years later. Bookwala (2003) showed that young adults characterized by a fearful (avoidant) attachment style were less likely to be engaged in a serious romantic relationship. More recently, Schindler et al. (2010) reported that attachment avoidance, but not anxiety, was predictive of not entering into committed dating relationships. Additionally, Adamczyk and Bookwala (2013) demonstrated that single participants reported higher levels of worry about being rejected or unloved (anxiety dimension), and lower levels of comfort with closeness and comfort with depending on others (depend dimension). Contrary to these findings, Schachner and colleagues (2008) reported that single participants were as likely as coupled ones to exhibit attachment security and rely on attachment figures.

Basing on prior studies on attachment and singlehood, Pepping and colleagues (Pepping & MacDonald, 2019; Pepping et al., 2018) outlined an attachment‐related theoretical model of long‐term singlehood. This model was based on attachment avoidance (characterized by the maintenance of attachment system deactiva- tion, discomfort with intimacy and closeness, and excessive self‐reliance) and attachment anxiety (character- ized by hyperactivation of the attachment system, sensitivity to rejection and abandonment, and intense distress when attachment needs are not met). The authors reviewed direct and indirect empirical evidence that was suggestive of the existence of at least three distinct subgroups of long‐term singles including: (1) single- hood due to attachment system deactivation; (2) singlehood due to attachment system hyperactivation; and (3) singlehood as a secure personal choice.

Pepping and colleagues (2018) also postulated associations between specific attachment orientations and unique patterns of cognitive, affective, and behavioral processes. Thus, differences in attachment may differ- entially predict reasons for long‐term singlehood and reasons that undermine the potential for intimacy. For example, the authors suggest that *avoidant* attachment would contribute to maladaptive behavioral processes associated with relational instability, lack of interest in potential partners, and engagement in casual, uncom- mitted sex (Pepping et al., 2018). In contrast, *anxiously* attached individuals’ intense fears of abandonment may result in behaviors that could undermine interpersonal success, despite their strong desire for connection (Pepping et al., 2018). Anxious individuals’ destructive behaviors may further be associated with relational instability, high risk of breakups, and less romantic interest from potential partners (Pepping et al., 2018). Finally, in the case of *securely* attached individuals, long‐term singlehood may not reflect difficulties in rela- tionships, but rather represent a secure personal choice whereby attachment needs are met in relationships outside of romantic pair‐bonds (Pepping et al., 2018). Securely attached individuals may thus form attach- ments to people other than romantic partners, and these relationships can successfully meet secure individu- als’ attachment needs (Pepping et al., 2018).

A particular merit of this model of long‐term singlehood moving forward is the potential to show how different attachment processes may determine the existence of at least three different subgroups of singles. More notably, the attachment model can offer an explanation as to *when* and for *whom* singlehood will be associated with positive or negative life outcomes. With this model at hand, it may be easier to explain why some studies may not have found singlehood to be related to negative life outcomes (e.g., DePaulo & Morris, 2005) (i.e., unique characteristics related to anxiety and avoidance attachment dimensions).

The anxiety and avoidance attachment dimensions contribute to diverse circumstances undermining the potential for intimacy, which in turn translates into negative life outcomes. However, in the case of existing buffering factors (different for different subgroups of singles), these negative life outcomes might be mitigated. Additionally, singlehood among securely attached individuals is not supposed to reflect attachment insecurity, but rather an individual’s personal choice. This personal choice of singlehood may thus translate into positive life outcomes. Furthermore, the proposition of the newest attachment model of long‐term singlehood (Pepping & MacDonald, 2019; Pepping et al., 2018) for the first time offers an excellent possibility of employing an influential, strong, and solid attachment theory to describe, explain, and predict single subgroups’ heteroge- neity and diversity of life outcomes as related to attachment‐based singlehood. Moreover, this model is a response to the repeatedly expressed demand for research focusing exclusively on single people, without com- paring single individuals with partnered individuals, which results in the presentation of single people in a negative light (DePaulo & Morris, 2005).

##### Final Remarks

The review of the literature and considerations pertaining to singlehood in this chapter represents one possible perspective, and it does not include a complete range of themes or constitute a complete and exhaustive list of all issues associated with singlehood. For instance, one of the issues not raised here – but which certainly falls within the scope of current and future research – is the impact of computer‐mediated communication (CMC) on interpersonal relationships (in particular in the domain of initiation and formation of relationships among single adults) (see Kim, Chapter 17). There is no doubt that the activity aimed at finding a partner has signifi- cantly altered over the centuries (Hardey, 2004), and online dating sites have now become influential businesses and cultural institutions (Dinh et al., 2018). Moreover, as stated in the literature, “[…] the digital dating is the second most common way that couples get together, after meeting through friends,” and “[…] online dating sites may be the most common way for somebody to enter into a new relationship or meet their future spouse” (Izang et al., 2016, p. 13). Therefore, future researchers should continue to explore the role of computer‐medi- ated communication and online dating services, not only in regard to finding a partner by single individuals, but also with regard to health outcomes and online support that can be sought by single individuals in order to cope with singlehood.

In addition, this chapter does not include a review of the literature on singlehood in reference to sexual ori- entation. Therefore, it should be noted here that, considering the increasing visibility of nonheterosexual indi- viduals and the neglect of the issue of nonheterosexual singlehood in scientific literature (with some exceptions, e.g., Hostetler, 2009), we may call for studies that will overcome this gap in research by focusing on nonhetero- sexual single adults.

We began this chapter with the statement that the contemporary context of intimate relationships is now characterized by heterogeneity of alternative forms of marriage and family life. Moreover, we have also empha- sized that singlehood is not a recent phenomenon and was already present in the past. To round off this chap- ter, we may end with the statement that singlehood will also occur in the future, just as intimate and close relationships will still last. Therefore, our task as researchers is to make every possible effort to better under- stand singlehood and factors associated with it. Our efforts are, in turn, expected to relay objective and reliable investigations, which should provide us with robust findings.

Continuing prior and natural directions of research devoted to the investigation of reasons for singlehood and its outcomes, we may take a further step. This step should extend beyond simple comparisons between single individuals and individuals in relationships (e.g., DePaulo, 2014). Future research should concentrate more on single individuals, with a focus on discovering the diversity of single life and its aspects per se (and not in reference to partnered life). The question we face now is no longer *why* people remain single, but *how* they function as single persons. This can begin from the analysis of the very ordinary aspects of single life (such as shopping and spending spare time), to the pursuit of meaning in life.

Additional questions that could be formulated involve not just questions about how miserable single peo- ple might be, but what makes single people satisfied with their lives despite the lack of a partner, or when

singlehood may be beneficial and related to positive outcomes. A review of the literature and considerations presented in the chapter demonstrated a gradual shift from the concentration on negative aspects of single- hood to positive aspects, including positive indicators of mental health such as emotional and psychological well‐being (e.g., Adamczyk & Segrin, 2015a, 2015b). This recognition may be a starting point and encourage- ment to view singlehood from a more positive perspective. For example, the perspective of positive psychology opens the door to the examination of factors contributing to satisfaction with single status or factors ensuring positive mental health in a prolonged situation of involuntary singlehood.

Such efforts have already been seen in the literature, including the pursuit of buffering factors in the link between attachment‐based singlehood and health outcomes (Pepping & MacDonald, 2019; Pepping et al., 2018), as well as a recent proposal of clinical intervention when working with single adults from the perspective that views involuntary singlehood as ambiguous loss ( Jackson, 2018). Singlehood may represent a situation of ambiguous loss as a result of the lack of clear information as to whether an anticipated partner/spouse (who is psychologically present yet physically absent) will materialize at some point. However, these issues can be dealt with, for instance, by enhancing dialectical thinking, increasing resilience through normalizing ambiva- lence, tempering mastery, finding meaning, reconstructing identity, revising attachment, and discovering hope ( Jackson, 2018).

With respect to the general nature of future research, we suggest the need to conduct additional qualita- tive research on singlehood, enabling the discovery and understanding of the diversity and individuality of life histories of single people. In particular, we call for the integration of quantitative and qualitative research. This mixed‐methods approach would give us a deeper insight into the subjective perspective of singlehood, seen not only from the researcher’s but also from the single individual’s point of view. This subjective per- spective might then be confronted with the scientific perspective. Additionally, there is a need to conduct longitudinal assessments of factors associated with singlehood, enabling us to track single people’s life paths over time.

Finally, there is a need to conduct cross‐cultural research on singlehood. This need derives from the notion that human development is a result of dynamic interaction between an individual and his/her environment (e.g., Bronfenbrenner, 1979), and the social and historical context determines and differentiates the scope and nature of people’ experiences (Tyszkowa, 1990), including the activity aimed at finding a partner/ spouse. Since the association between marital status and subjective well‐being may depend on marital con- text (i.e., the degree to which marriage is recognized as a normative expectation or achievement by a given peer group) (Wadsworth, 2016), historical, social, political, and religious contexts may also affect the phe- nomenon of singlehood.

For instance, a Polish‐American study could be mentioned in which an interaction was noted between nationality and relationship status in the domain of romantic loneliness (Segrin et al., 2019). The lack of a romantic partner appeared to be more strongly associated with increased romantic loneliness for Polish than for American participants. Therefore, we may initially conclude that in societies in which people highly value the institution of marriage and attach great importance to having a partner (e.g., in Poland and Indonesia), single individuals may face strong pressure to marry and consequently experience tension associ- ated with making a choice between single life and marriage (Himawan et al., 2017; Żurek, 2016). Including social and cultural factors in further cross‐cultural research will undoubtedly allow us to determine the role of the social and cultural context with regard to the antecedents, correlates, and life outcomes of contem- porary singlehood.

In conclusion, past research has significantly contributed to our understanding of adult singlehood, establish- ing a solid foundation that can now serve as a starting point for further intensified efforts aimed at explaining singlehood, taking into account the contemporary context of intimate relationships. Recent trends in research on singlehood noted in the last two to three years suggest that research will be heading toward a more positive (beneficial) perspective of singlehood. This contrasts with the “pathologizing deficit perspective” ( Jackson, 2018), which has often been applied in past research (more or less consciously, and more or less explicitly). To conclude this chapter on a more positive note, we may state that currently researchers are making consider- able efforts that bring us closer “toward a psychology of singlehood” (Pepping et al., 2018).

Social Isolation, Loneliness, and Solitude in Older Adulthood

### Introduction

Time alone is a ubiquitous experience across the adult lifespan that becomes even more salient in old age. In fact, daily life assessments indicate that young and middle‐aged adults under age 65 spend about 30–40% of their waking time alone (Larson, 1990; Pauly et al., 2016; Pauly et al., 2018). This number goes up to over 70% among the oldest old (aged 84–102 years; Chui et al., 2014). Time alone is often seen as negative and it can be detrimental to physical and mental health (Holt‐Lunstad et al., 2015; Ong et al., 2016). That said, we would like to challenge ourselves and the field to strive for more conceptual clarity on the meaning of time alone. Doing so enables us to consider how different facets of time alone may show unique links with overall physical and mental health, to take into account associations between solitude and time‐varying physical and mental health indicators in daily life as well as how these may be related to longerterm outcomes, and to better understand the role of solitude in older adulthood.

### A Multifaceted View of Time Alone: Social Isolation, Loneliness, and Solitude

Three interrelated but conceptually distinguishable constructs offer unique perspectives on the different facets of *time alone* in older adulthood. In studies with adult populations, *social isolation* is often defined as an objectively quantifiable lack of social connections (Holt‐Lunstad et al., 2015). It is typically measured using sociodemographic proxies such as living alone or being single/widowed, or by the size of an individual’s social network.

*Loneliness*, in contrast, is a negative subjective experience resulting from perceiving a lack of social contact relative to desired levels of social contact (Perlman & Peplau, 1981). In other words, social isolation addresses structural aspects of an individual’s social network, whereas loneliness captures the subjective perception of and the meaning attributed to one’s lack of social connectedness. Socially isolated individuals have an elevated risk of loneliness. However, it is incorrect to assume that individuals with few social connections must feel lonely. Instead, it should be recognized that there are individuals with objectively small but tight social networks who do not feel lonely all the time, as well as individuals with large social networks who feel lonely even when surrounded by other people (Holt‐Lunstad et al., 2015).

A third construct, which has garnered considerably less attention, is solitude. *Solitude* is objectively defined by an absence of social interaction (Burger, 1995). This may occur because no other person is present but it can

also include situations when no social interaction takes place despite other people being present, such as when walking down a busy street. Solitude is sometimes measured using proxies such as the objective condition of being alone (Larson, 1990).

Recognizing the difference between social isolation, loneliness, and solitude is key for conceptual precision. Importantly, precise definitions are crucial for a better understanding of the role that these distinct phenomena play in shaping physical and mental health across the adult lifespan and into old age, while also taking into account the extent to which they might be interrelated. For example, overall amount of time spent in solitude (without social interaction) and social isolation (having very few or no social ties) may be differentially associated with physical and mental health. Importantly, such associations also depend on whether momentary solitude co‐occurs with social isolation. In other words, being in solitude and having no one to turn to (social isolation) may be a completely different experience from being in solitude while also being part of a large social network.

### Social Isolation, Loneliness, and Solitude in Adulthood: Links with Physical and Mental Health

Seminal work on social isolation and loneliness provides compelling evidence for their negative associations with physical and mental health and positive associations with mortality risk that are similar in size to well‐ established risk factors like smoking and obesity (Cacioppo & Cacioppo, 2014; Cornwell & Waite, 2009; Holt‐ Lunstad et al., 2015; Ong et al., 2016; O’Súilleabháin et al., 2019). *Social isolation* specifically has been associated with an elevated risk of depression, low life satisfaction, poor self‐rated physical health, cardiovascular disease, and mortality in samples aged 30–103 years (Berkman & Syme, 1994; Cornwell & Waite, 2009; Coyle & Dugan, 2012; Grant et al., 2009; Holt‐Lunstad et al., 2015; Seeman et al., 2002; O’Súilleabháin et al., 2019).

Similarly, *loneliness* has been associated with elevated depressive symptoms, functional limitations (e.g., lim- ited ability to walk a block or climb stairs), poor self‐rated physical health, and mortality, often even when con- trolling for marital status and other proxies of social isolation in samples aged 50–103 years (Cacioppo & Cacioppo, 2014; Cornwell & Waite, 2009; Coyle & Dugan, 2012; Hawkley & Cacioppo, 2007; Holt‐Lunstad et al., 2015; Luo et al., 2012; O’Súilleabháin et al., 2019). In addition to long‐term longitudinal evidence of asso- ciations between loneliness and physical and mental health risks, momentary or state loneliness has also been associated with indices of physical and mental health in the everyday lives of adults aged 50–97 years (Adam et al., 2006; Piazza, Charles, Stawski et al., 2013; Queen et al., 2014). For example, repeated daily life assessments from older adult participants point to time‐varying associations between state loneliness and the secretion of cortisol, an important stress hormone (Adam et al., 2006). Specifically, elevated loneliness on a given day was associated with subsequent increases in the cortisol awakening response (operationally defined by the increase in salivary cortisol during the first 30 minutes after awakening) on the following day (Adam et al., 2006). The cortisol awakening response is typically interpreted as an indicator of anticipation of stressful events (Hoppmann et al., 2018). In addition, momentary increases in negative affective states (including loneliness) have been associ- ated with concurrent elevations in overall cortisol secretion across the day as well as higher bedtime cortisol in older but not middle‐aged adults (Piazza, Charles, Stawski et al., 2013). Together, these findings suggest that state loneliness is associated with an activation of the hypothalamic‐pituitary‐adrenal axis. This by itself is adap- tive as it mobilizes energy to do something about one’s situation, which in the case of loneliness could mean making an effort to reengage with other people. However, chronic activation of the hypothalamic‐pituitary‐ adrenal axis, has been shown to be associated with increased physical and mental health risks (Miller et al., 2007; Seeman & Gruenewald, 2006). Moreover, findings suggest that it is important to distinguish between (1) associa- tions between moment‐to‐moment fluctuations in feelings of loneliness and physiological indicators such as sali- vary cortisol in everyday life, assessed using intensive repeated measures designs, and (2) long‐term links between overall levels of loneliness and overall health assessed using long‐term longitudinal methods. Together, these two approaches offer insights into everyday processes that may accumulate over time, putting older adults on either more or less favorable long‐term physical and mental health trajectories.

In contrast to loneliness and social isolation, *solitude* has been linked with positive as well as negative indices of physical and mental health in lifespan samples ranging from 9 to 85 years of age (Larson, 1990; Lay et al., 2019; Pauly et al., 2016; Pauly et al., 2018). Specifically, evidence from cross‐sectional studies, lab experi- ments, and daily life assessments with samples of various ages across the lifespan shows that solitude is linked with biomarkers, emotional experiences, and cognitions. For example, momentary solitude has been shown to be associated with increased secretion of cortisol and dehydroepiandrosterone sulfate, indicating activation of the two main stress axes (hypothalamic‐pituitary‐adrenal and sympathomedullary; Pauly et al., 2016). Solitude has also been associated with both negative and positive emotional experiences. Specifically, it has been linked with low life satisfaction, decreased levels of high‐arousal positive affective states (such as excite- ment), and increased levels of low‐arousal negative affective states (such as sadness) on the negative end of the spectrum, and with increased levels of low‐arousal positive affective states (e.g., calm) on the positive end of the spectrum (age range of samples: 18–88 years; Lam & Garcia‐Roman, 2019; Larson et al., 1985; Milek et al., 2018; Nguyen et al., 2017). These findings suggest that solitude can go along with heterogeneous emo- tional experiences that may reflect very different activities, including rumination, creativity, and spirituality (Long & Averill, 2003).

In line with this idea, findings from repeated daily life assessments of young and older adults show that it is possible to distinguish between different types of solitude experiences (age range: 18–85 years; Lay et al., 2019). Specifically, some solitary episodes are experienced negatively, as indicated by elevated negative affect and nega- tive cognitions such as rumination, whereas others are characterized by increased low‐arousal positive affect and the near‐absence of negative cognitions and affect (Lay et al., 2019). In addition to this intraindividual vari- ability in the propensity to experience solitude positively or negatively as individuals go about their daily lives, there is also evidence that solitude may be experienced more positively in old age than in earlier life phases (study age range: 9–103 years; Lang & Baltes, 1997; Larson, 1990; Pauly et al., 2016). For example, older adults report lower levels of low‐arousal negative affect during solitude, and show weaker momentary solitude‐corti- sol associations, than younger adults (Pauly et al., 2016). Hence, unlike social isolation and loneliness, solitude seems to have both negative and positive connotations. From a lifespan perspective, this raises the question of what accounts for the tremendous heterogeneity that is specific to solitude experiences. The next section aims to shed light on the importance of *time* (i.e., amount of time spent in solitude) and *timing* (when solitude hap- pens) for understanding the momentary correlates and longer‐term consequences of solitude, before moving on to lifespan psychological and aging models that may provide a theoretical rationale for why solitude is expe- rienced both negatively and positively.

### Solitude in Older Adulthood: Time Matters

The idea that time matters is not always made explicit but is a cornerstone of almost all lifespan psychological and aging research (Baltes et al., 1998; Gerstorf et al., 2014). Development occurs at different paces and at dif- ferent levels. A thorough understanding of the mechanisms linking solitude with physical and mental health in old age therefore requires that attention be paid to multiple time metrics (Gerstorf et al., 2014).

Lifespan psychology has a rich tradition of examining developmental change within and across domains of functioning using long‐term longitudinal data that track individuals over a time span of years or even decades (macro‐time; Gerstorf et al., 2014; Schaie & Hofer, 2001). A complementary approach investigates intraindi- vidual variability over much shorter time scales such as weeks, days, hours, minutes, and sometimes seconds (micro-time; Gerstorf et al., 2014; Nesselroade, 1991; Sliwinski, 2008). To date, the integration of multiple timescales within the same study remains rare (Figure 13.1; see Hoppmann et al., 2007; Piazza, Charles, Sliwinski et al., 2013 for exceptions). Making explicit the importance of timescales has significant potential to advance our understanding of the antecedents, correlates, and consequences of solitude in old age, which may in turn help explain the tremendous heterogeneity of solitude‐health associations.

As noted previously, solitude is often characterized by the absence of social interaction (Burger, 1995). Although this definition does not explicitly mention time, it comes with the implicit assumption that solitude

has a beginning and an end, and that it occurs over a certain period of time. We contend that being more explicit about matters of time would push the field in new directions and raise questions of tremendous applied significance, such as: 1) How long can a solitary episode last before it becomes maladaptive?; 2) Is there a quan- titative shift beyond which solitude turns into social isolation?; and 3) Can we identify pathways through which momentary biological, emotional, and cognitive correlates of solitude accumulate over time to ultimately shape longer‐term health and well‐being outcomes in old age? Answering these questions is crucial because it would help identify targets for intervention before negative physical and mental health outcomes manifest. A careful consideration of time might also lead one to ask: 4) Is it possible that solitude, when limited in dura- tion, serves important adaptive functions that improve long‐term health? Similar to the idea of acute loneliness flagging a social deficit that motivates social reengagement (Hawkley & Cacioppo, 2010), might it be the case that solitude serves an adaptive function by facilitating self‐reflection or emotion regulation that, although stressful at the time they occur, may promote longer‐term physical and mental health?

### Solitude in Older Adulthood: Explanatory Mechanisms

Beyond the much‐needed recognition of timescales, it is also important to consider that processes linking soli- tude with physical and mental health may play out differently across different life phases. This idea is supported by empirical evidence showing that associations between solitude and affect quality in old age differ from ear- lier life phases (Larson, 1990; Pauly et al., 2016). Several lifespan and aging models offer theoretical rationales for why this may be the case. Notably, the theoretical predictions one might reasonably derive from these mod- els differ substantially.

Research focusing on the role of social relationships for health and well‐being across the adult lifespan shows that social networks change systematically in size, function, and quality across the adult lifespan with implica- tions for how solitude may be experienced (Antonucci, 2001; English & Carstensen, 2014; Fiori et al., 2007). In old age, social networks are often smaller than earlier in life (English & Carstensen, 2014). One reason is social losses due to the death of members of one’s social network or changes in social roles with retirement, which may go along with negative emotional experiences (Wagner et al., 1999; Fiori et al., 2007). Another reason is an increasing need for rest and recovery in old age, which does not necessarily have ramifications for emotional experiences (Baltes et al., 1999). A third reason is the active pruning of social networks to optimize emotional experiences (English & Carstensen, 2014; Fiori et al., 2007; Wagner et al., 1999); older adults let go of peripheral relationships to help maintain their inner circle of particularly close relationships. This selective narrowing of social networks to the most important ties is adaptive and has been shown to serve important emotion regula- tion functions (English & Carstensen, 2014). Accordingly, older adults may spend more time in solitude than their younger counterparts because a) they have fewer opportunities for social engagement, b) they need more time for recovery, c) they are no longer willing to spend time with distant or unpleasant people (such as the nasty colleague they used to see every day of their working life), or d) they choose to spend their finite time with people who are emotionally meaningful to them. Importantly, some of the observed age‐related increases in time spent in solitude happens by choice: Older adults may at least sometimes choose to be alone over spend- ing time with people who do not bring meaning to their lives, and this would have positive ramifications for emotional experiences. This theoretical backdrop dovetails with empirical findings showing that solitude is experienced more positively in old age as compared to earlier life phases (Larson, 1990; Pauly et al., 2016). If, however, solitude does not occur by choice (e.g., if it is due to social network losses), this solitude is likely to be associated with negative emotional experiences. In other words, age‐related changes in social relationships may contribute to a high base rate of solitude in old age as well as substantial heterogeneity in how solitude is experienced.

Another reason why older adults may spend more time in solitude than younger adults may be related to how older adults approach the problems they experience in everyday life. Age‐related shifts in everyday prob- lem solving may be linked with older adults’ emotional experiences during solitude. Research on age‐related differences in everyday problem‐solving using samples of various ages across the adult lifespan indicates that older adults engage in more complex problem solving than young adults, often involving a combination of dif- ferent problem solving strategies (Blanchard‐Fields, 2007; Hoppmann et al., 2008; Hoppmann et al., 2007). For example, older adults may simultaneously analyze the problem at hand and hide their negative feelings to spare others from seeing their distress (Blanchard‐Fields, 2007; Hoppmann et al., 2008). It is therefore plausible to suppose that older adults may be more likely than younger adults to get themselves out of a problem situation, to the extent that doing so might help them think things through and regulate their negative emotions in a way that preserves their relationships with other people. This would also be in line with empirical findings that older adults spend more time in solitude than middle‐aged and young adults (Larson, 1990; Pauly et al., 2016; Pauly et al., 2018). Solitude that is devoted to everyday problem solving may be associated with concurrent negative emotional experiences but may also pave the way for positive emotional experiences after older adults have finished resolving the problem at hand. The literature on age‐related differences in everyday problem solv- ing may, therefore, help explain age‐related increases in solitude and the considerable heterogeneity in associa- tions between solitude and emotional experiences in old age (negative emotional experiences when there is an ongoing problem; positive emotional experiences after overcoming the problem).

In addition to changes in social networks and in everyday problem solving, a third explanation for the observed heterogeneity of solitude‐affect associations in old age could be declining health, which is a threat to autonomy. Declining health and an increased reliance on others for support in old age can shape interactions with close relationship partners in ways that potentially undermine self‐esteem, life satisfaction, and autonomy (age range of samples: 20–103 years; Lang & Baltes, 1997; Smith & Goodnow, 1999). Consistent with this notion, Lang and Baltes (1997) showed that engaging in activities with other people was positively associated with everyday satisfaction and autonomy among older adults who did not report any difficulties with daily life

activities. However, among older adults who had difficulties with everyday activities, the opposite was true – engaging in activities involving other people was negatively associated with satisfaction and autonomy (Lang & Baltes, 1997). One explanation that has been entertained is that mastering daily activities alone can become an important source of satisfaction and autonomy during a phase in life (old age) when autonomy cannot (or can no longer) be taken for granted due to health limitations. This line of work provides a resource‐ based explanation for the reported heterogeneity in solitude‐affect associations in old age, and calls for the consideration of interindividual differences in autonomy that may shape experiences of solitude.

Taken together, well documented age‐related changes in social relationships, everyday problem solving, and autonomy may help explain why older adults spend a lot of time alone and may shed light on potential reasons why solitude is sometimes experienced negatively and sometimes positively in old age.

### Moderators of Solitude‐Health Links

The heterogeneity of associations between solitude and physical and mental health in old age raises the impor- tant questions of who may experience solitude more negatively or positively, and under what circumstances. In the following paragraphs, we highlight potential person‐level and situation‐specific factors shaping solitude experiences, referencing empirical findings from older adult samples whenever possible.

One of the most obvious factors, which occurs at both the person‐level and the situation‐level, is whether soli- tude is sought after (occurs by choice). This question has been addressed by using interindividual‐difference measures such as the Preference for Solitude Scale, as well as by using time‐varying measures asking participants, when in solitude, whether they would prefer to be interacting with other people (Burger, 1995; Lay, Pauly et al., 2020). Research examining interindividual differences in preference for solitude using samples of varying ages across the lifespan shows that individuals with a high preference for solitude are more likely to experience soli- tude positively, that they report greater enjoyment of solitary activities, and that they report more positive affect and less loneliness during solitude, compared to individuals low in preference for solitude (age ranges: 18–85 years; Lay, Pauly et al., 2020; Lay et al., 2019; Leary et al., 2003; Toyoshima & Sato, 2019). Findings regarding fluctuations in solitude desire across different situational circumstances are more complex and reveal age‐by‐ desire for solitude interactions, suggesting that middle‐aged adults experience reduced momentary positive affect when desiring solitude, whereas older adults do not (Lay, Pauly et al., 2020). Of note, preference for soli- tude at the level of the individual has been shown to be correlated with but distinct from introversion. Introversion entails a tendency to spend more time in solitude for any reason, including a genuine appreciation for solitude; hence, whereas high preference for solitude is associated with positive experiences of solitude, introversion is associated with both positive and negative solitude experiences (Nestler et al., 2011; Zelenski et al., 2014).

Several additional person‐level factors have been shown to be associated with positive experiences of solitude in undergraduate and older adult samples, including social self‐efficacy, autonomy, and low rumination tenden- cies (study age range: 18–85 years; Lay et al., 2019; Nguyen, Weinstein et al., 2019; Nguyen et al., 2018). However, there are also indications that individuals with high self‐reflection tendencies may be less likely to experience solitude positively (Lay et al., 2019); this may be because a tendency to think deeply about life and about one’s own problems and goals can lead to troubled or difficult moments of solitude (even if such contemplation may serve a person well later on).

Research that takes into account social relationship characteristics when examining time‐varying solitude‐ affect links has revealed mixed findings in samples of various ages across the lifespan. For example, it has been shown that middle‐aged and older adults who are married report greater emotional arousal, concentration, and challenge when in solitude than their unmarried counterparts (Larson et al., 1985). Furthermore, a study involving samples aged 18 to 85 showed that individuals with better‐quality relationships reported overall greater positive affect and lower negative affect in everyday life, as well as lesser increases in low‐arousal nega- tive affect during solitude, compared to individuals with poorer‐quality social relationships (Pauly et al., 2018). Interestingly, it has also been shown that older adults with highly conflictual social networks experience greater

negative affect and lower positive affect in daily life, but report *lower* negative affect during solitude, compared to individuals with low conflict in their social networks (Birditt et al., 2019).

Taken together, these findings underscore the need to consider different motivations for social withdrawal. For example, research with younger samples indicates that a strong desire to escape or avoid interacting with others (social avoidance motivation) may have a more negative impact on emotional experiences than simply not deriving pleasure from social interactions (a lack of social approach motivation; Brown et al., 1997; Nelson, 2013). Notably, social approach goals have been shown to be positively associated with emotional expe- riences in daily life, and social avoidance goals to be negatively associated with emotional experiences in daily life, among younger adults but not among middle‐aged and older adults, supporting the idea that older adults may be more motivated to maintain a smaller number of meaningful social ties, and less motivated to maintain a larger number of less meaningful social ties (Nikitin & Freund, 2018).

Hence, there is empirical evidence that person‐ and situation‐level factors play a role in how solitude is expe- rienced; these factors include but are not limited to motivation and preference for solitude, cognitive styles such as rumination and self‐reflection, and indicators of social functioning such as social self‐efficacy, overall social relationship quality, and social avoidance/approach motivation. Further research is needed to better under- stand the mechanisms underlying the tremendous heterogeneity in solitude experiences in old age.

### Future Directions

The literature on solitude among older individuals is fast evolving and is filling important gaps in research on social relationships and health. We would like to close by highlighting a few challenges that ought to be addressed to move the field forward.

*Temporal Dynamics*. Most operational definitions of solitude do not make any assumptions about the tem- poral stability of the underlying phenomenon. Now that solitude has been established as a phenomenon dis- tinct from related constructs such as social isolation and loneliness, it may be important to take a closer look at how solitude operates at different timescales. Doing so promises to provide answers to core questions, such as determining what range of solitude episode durations are linked with positive emotional experiences, and whether there might be a threshold beyond which solitude becomes toxic. Furthermore, it may be that not only does *time* matter but also that *timing* matters. We may need to take a closer look at daily life contexts that precede and follow episodes of solitude in time. For example, it may be beneficial to use solitary time to enhance focus before having to engage in a cognitively challenging task. On the other hand, if experiencing a negative event such as getting a phone call from a doctor with test results indicating a worsening health condi- tion, solitude may not be adaptive because it could facilitate rumination over this news. Future research is needed on daily life contexts that shape whether the solitude that comes before or after may be adaptive or maladaptive.

*Gain/Loss Dynamics*. Combining assessments across different timescales (Figure 13.2) also promises to help answer key questions about the adaptive nature of solitude. For example, might it be the case that brief solitary episodes characterized by self‐reflection and emotion regulation are experienced negatively as they occur, but that they end up promoting physical and mental health later on? Notably, one could also construe scenarios in which the opposite is true. For example, is it conceivable that older adults seek solitude in the absence of a bet- ter alternative and feel good about their choice, without realizing that doing so ultimately goes against the fundamental human need to belong (Beckes & Coan, 2011; Brown et al., 2007; Epley & Schroeder, 2014)? This scenario might make older adults feel good but also go along with the activation of physiological stress systems indicating a state of alarm, contributing to worse health in the long run. Such questions ultimately require complex study designs with repeated daily life assessments nested within long‐term longitudinal assessments (measurement burst design; Sliwinski, 2008). Thus, measuring momentary experiences of solitude in their daily life context should be combined with tracking changes in individual functioning over time. Repeated measurements of solitude experiences as individuals grow older would also help shed light on intraindividual change in psychosocial correlates of daily interpersonal contexts. This research strategy is important because

most prior research on age differences in solitude is based on cross‐sectional comparisons and, thus, does not allow any conclusions about developmental changes and gain/loss dynamics.

*Operational Definitions of Solitude*. Solitude is measured in a multitude of different ways, and these differences in measurement have conceptual ramifications. Solitude can be and sometimes has been operationalized as an absence of social interaction and sometimes as physical aloneness (Burger, 1995; Larson, 1990). We suspect that these two operational definitions may capture different phenomena. For example, an absence of social interac- tion could occur even in the company of other people; such a scenario seems fundamentally different from a situation in which one is physically alone with no possibility for face‐to‐face contact. This idea is supported by social baseline theory (Beckes & Coan, 2011), which proposes that because humans are hardwired to be around other people (the brain assumes others are present to help meet life’s demands), being alone is stressful. On the other hand, being alone does not necessarily preclude the possibility of social contact. One might further ask what constitutes social interaction. A conservative definition of social interaction may be limited to actual in‐ person contact. However, electronic interactions may matter as well. It also remains to be seen whether social needs may be satisfied by the presence of a pet, or by looking at a photo and thinking of a loved one. Many would agree that there are qualitative differences between these different social situations, and given the central role of social interaction in the definition of solitude, such differences seem important to tackle in future research. Finally, what constitutes someone being present is not as clear as it may seem at first glance. When thinking about daily life experiences, one may ask whether partner presence ought to mean that someone is in the same room, or whether it is enough that they be in the same house. The former definition would mean that one can sense the other person by hearing, seeing, or smelling them, thereby satisfying the proposed evolution- ary roots of the human need for social contact, whereas the latter definition may be limited to knowing some- one is there without actually sensing them.

*Life Transitions*. Research with children and young adults suggests that solitude may play a unique role during life transitions (Coplan et al., 2018; Nguyen, Werner et al., 2019), for example, a need for increasingly fleeting moments of solitude after the transition to parenthood (Holloway, 1998; Larson, 1990). However, little is known about the potential functions of solitude during transitions in later life. Nguyen et al. (2019) showed that autono- mously motivated solitary time was associated with higher self‐esteem, higher social relatedness, and less loneli- ness during the transition to college. It is an open empirical question whether similar processes (or perhaps their opposite) might take place during the transition to retirement. Moreover, little is known about the role of solitude in death and dying. Older adults approaching the end of life experience accelerated declines in well‐being but there is also much heterogeneity in end of life well‐being trajectories (Gerstorf et al., 2010). The amount of time older adults dying at home versus in hospitals spend alone may be an important factor that can provide insights into how to better serve the needs of particularly vulnerable older adults.

*Cultural Differences*. To date, most research on solitude, and particularly in old age, is based on North American samples. Importantly, empirical findings indicate that solitude may be experienced differently depending on cul- tural heritage, immigration status, and acculturation ( Jiang et al., 2019; Lay, Fung et al., 2020; Pfeifer et al., 2019). For example, solitude may be experienced more positively in East Asian cultures that value self‐reflection, low‐ arousal forms of affect (e.g., calm), and introversion, as compared to North American cultures that deemphasize these values ( Jiang et al., 2019; Tsai et al., 2006). Such observations not only threaten the generalizability of findings based on North American older adult samples, but also point to the need to better understand the cul- tural contours of solitude, including differences in individuals’ social needs across different countries as well as among individuals of different cultural heritages within the same country.

*Applied Significance*. A recognition of the role solitude plays in physical and mental health in old age also raises questions about challenges among specific segments of the population who may spend a particularly large amount of time alone. Such subgroups may include older adults in rural areas who are no longer able to drive (Edwards et al., 2009) and older adults who have immigrated to another country and who are living far away from their extended family ( Jiang et al., 2019). Finally, older adults of varying sexual orientation and gen- der identity have been shown to spend more time alone than heterosexual older adults (de Vries, 2015). This group has ample experience with stigma and marginalization. At the same time, the cohort of currently aging LGBTQ older adults are the ones who paved the way for fundamental changes regarding LGBTQ rights that may have given rise to an increased sense of agency, resilience, and hardiness in old age (de Vries, 2015). It is crucial to recognize the unique circumstances of subgroups of the population who are often excluded from aging research, to better understand the generalizability of findings on solitude in old age and to better serve the specific needs of neglected subgroups.

### Conclusion

This chapter calls for a consideration of different operational definitions of solitude that have been shown to have differential links with physical and mental health; it identifies specific age‐related changes in social rela- tionships, everyday problem solving, and autonomy that distinguish solitude in old age from solitude in earlier life phases; and it highlights potential mechanisms that help explain why solitude is sometimes experienced negatively and sometimes positively. Despite considerable advances in solitude research in old age, many key questions remain. These include but are not limited to qualitative differences in associations between solitude and concurrent versus long term physical and mental health, the cultural contours of these associations, and potential boundary conditions.

### Social Approach and Avoidance Motivations

Belongingness is a central human need. Lack of, or low quality of, social bonds impacts well‐being, health, and even mortality (Hawkley & Cacioppo, 2010; Holt‐Lunstad et al., 2015). Given this tremendous importance, it is essential for people to have satisfying social relationships. However, individuals differ in their ability to initial- ize social interactions and maintain social ties. In this chapter, we take a motivational approach to explain why some individuals are socially successful and others are not. Specifically, we focus on the dispositional motiva- tion to approach positive social outcomes, such as acceptance and intimacy, and the dispositional motivation to avoid negative social outcomes, such as rejection and loneliness. The former dispositional motivation is typi- cally called *social approach motivation*, whereas the latter is typically called *social avoidance motivation* (Elliot et al., 2006; Mehrabian & Ksionzky, 1974).

Social approach and avoidance motivations are two fundamental motivational dimensions that differ in the perceived end state: In social approach motivation, behavior is directed by a perceived positive (i.e., desirable) end state, whereas in social avoidance motivation, behavior is directed by a perceived negative (i.e., undesira- ble) end state (Elliot et al., 2006; Mehrabian & Ksionzky, 1974). As most social situations are ambiguous, the cognitive bias with which a person perceives the situation is important in determining whether it is interpreted in a positive or negative way. For example, a smile from a colleague can be interpreted as an invitation to inter- act or as sarcasm. Individual differences in approach and avoidance motivations affect the interpretation of and reaction to social situations like these.

In this chapter, we discuss processes that underlie the positive and negative outcomes of social approach and avoidance motivations. Taking a developmental perspective, we explore how these processes might change across the life span. Finally, we discuss the implications of the research on approach and avoidance motivations for interventions to prevent social isolation.

### Approach and Avoidance as Two Fundamental Systems

The idea that there is an appetitive system that regulates responses to potentially rewarding stimuli and an aversive system that regulates responses to potentially punishing stimuli has a long history in many psycho- logical domains such as in research on affect, personality, cognitive evaluation, neurophysiology, and moti- vation (for a summary, see Gable et al., 2003). Some researchers suppose that the distinction between appetitive and aversive systems is fundamental and innate (e.g., Carver et al., 2000), an assumption that has been supported by empirical evidence (Crawford et al., 2020; Gable et al., 2003). As Gable and colleagues

put it: “. . . this basic distinction may serve as a general organizing construct underlying a variety of more specific dispositional processes in the areas of emotion, motivation, and personality” (p. 369).

One of these specific dispositional processes in the area of motivation refers to social approach and avoid- ance motivations. It seems that social approach and avoidance motivations share commonalities with other constructs of the appetitive and aversive system. For example, Nikitin and Freund (2011) found that social approach motivation is moderately correlated with extraversion and the behavioral activation system, whereas social avoidance motivation is moderately correlated with neuroticism and the behavioral inhibition system. However, social approach and avoidance motivations focus specifically on what drives peoples’ behavior, cogni- tions, and emotions in interpersonal situations characterized by possible acceptance and rejection.

### Social Approach and Avoidance Motivations and Related Constructs

Social approach and avoidance motivations are also associated with other constructs in psychology. For instance, the construct of shyness is related to social avoidance motivation. Shyness is described as an inhibited desire to approach another person (Asendorpf, 1990a). The inhibition of the approach tendency is triggered by social‐ evaluative concerns, specifically by the concern to be neglected and rejected (Asendorpf, 1990b). These concerns are also typical for social avoidance motivation. As such, shyness is the overt expression of an underlying social avoidance motivation. It is important to note that social avoidance motivation in the present understanding is not the avoidance of social interactions or social situations per se (cf. Asendorpf, 1990a). Instead, it is the avoidance of possible threats associated with social situations with simultaneous desire to affiliate with others (Mehrabian & Ksionzky, 1974). As such, it is an approach‐avoidance conflict in the terminology of Asendorpf (1990a).

Rejection sensitivity is another construct that overlaps with social avoidance motivation. Similar to social avoidance motivation, rejection sensitivity is part of the aversive system as described earlier (Downey et al., 2004). Further, there are similarities in experience and behavior: People who experience rejection sensi- tivity are those “who anxiously expect, readily perceive, and overact to rejection” (Downey & Feldman, 1996, p. 1327), which is also true for high social avoidance motivation (see Gable & Berkman, 2008). Moreover, rejec- tion sensitivity has been defined in terms of “generalized negative social expectation: fear and apprehension that interactions with others will result in rejection, discomfort, and suffering” (Mehrabian, 1994, p. 98). Sensitivity to rejection is thus the core of social avoidance motivation as the anxiously expected rejection is the negative end state that is to be avoided. Not surprisingly, rejection sensitivity and social avoidance motivation are often used synonymously (Elliot et al., 2006; Nikitin & Freund, 2010).

Third, although social avoidance motivation is associated with similar behavior and experience as social anxi- ety disorder (such as being anxious when meeting new people or being withdrawn in unfamiliar social settings; Stein & Stein, 2008), social avoidance motivation does not reach the diagnostic criteria for social anxiety disor- der. Thus, the main difference between social avoidance motivation and social anxiety disorder might be the difference in the intensity of the associated experience and behavior.

Finally, social approach and avoidance motivations are to be distinguished from affinity for aloneness. Affinity for aloneness expresses the desire to spend time alone (e.g., in order to pursue one’s own interests) and is unre- lated to the desire to spend time with others (Teppers et al., 2014). As such, affinity for aloneness might be unrelated to social approach and avoidance motivations, as both motivations are associated with the desire to spend time with others (Mehrabian & Ksionzky, 1974). In contrast, aversion of aloneness seems to be an expres- sion of sociability but is also related shyness (Teppers et al., 2014). As such, it might correspond with social avoidance motivation.

### Historical Roots of the Research on Social Approach and Avoidance Motivations

Two of the first researchers to differentiate between social approach and avoidance motivation were Mehrabian and Ksionzky (1974). Whereas initial research on affiliation (i.e., the desire to establish and maintain social relationships) was based on the assumption of a single dimension, Mehrabian and Ksionzky argued that it is

difficult to integrate the diverse findings reported in the literature on affiliation into a single framework. They, therefore, proposed two dimensions of affiliative attributes that in their view provided a more satisfactory inte- gration: generalized positive social expectations and behaviors (i.e., social approach motivation) and general- ized negative social expectations and behaviors (i.e., social avoidance motivation).

The considerable research based on this distinction has shown that approach and avoidance motivations are largely independent of each other and that they exhibit theoretically different (and not simply inverse) patterns of relationships with social experience and behavior (see Gable & Gosnell, 2013; Mehrabian, 1994, for summa- ries of this research). In the next few sections, we will discuss cognitive, behavioral, and emotional processes that underlie these association between approach and avoidance motivations and their consequences. We will start by discussing the contexts in which the processes take place.

### Establishing and Maintaining Social Relationships as a Function of Social Motivations

Previous studies have found that social approach motivation has positive consequences, whereas social avoid- ance motivation has negative consequences for social success in interactions with strangers (Nikitin & Freund, 2010, 2019b), students sharing the same apartment (Nikitin & Freund, 2017), friends (Gable, 2006), and romantic partners (Kuster et al., 2017). This evidence suggests that these dispositional motivations have an impact on establishing and maintaining social relationships and that the impact is unique, meaning that the absence of approach motivation is not identical with the presence of avoidance motivation.

As avoidance motivation is associated with the avoidance of undesired end states as it involves a state of vigi- lance to insure against losses and, therefore, leads to risk‐averse behavior (Crowe & Higgins, 1997). As a conse- quence, avoidance motivation leads people to decide against participating in a new social situation and to prefer to miss the chance of establishing a new social relationship rather than to expose themselves to possible failure (Nikitin et al., 2019). It seems that it is mainly due to the fear of negative evaluation by others. As Beck and Clark (2009) found, avoidance motivation was related to a preference for social situations that provide no evalu- ation from others over social situations that do provide such evaluative information. In contrast to avoidance motivation, approach motivation is positively associated with relationship initialization (Nikitin et al., 2019). Nikitin and colleagues found that approach motivation was positively associated with relationship initialization in a sample of students who were moving out of the parental home (Nikitin et al., 2012). In a longitudinal investigation of the same sample, Nikitin and Freund (2017) found that students with strong approach motiva- tion reported low levels of loneliness (an indicator of social adjustment to developmental transitions; Cutrona, 1982) up to two years after the transition.

Social approach and avoidance motivations also seem to impact the maintenance of social relationships. For example, engaging in sex due to avoidance motivation (e.g., to avoid disappointing one’s partner) was found to be detrimental to the maintenance of relationships over time. In contrast, engaging in sex due to approach motivation (e.g., to make one’s partner feel good) had positive effects on the maintenance of relationships (Impett et al., 2005). In addition, in a short‐term longitudinal study of dating couples, it was found that individu- als who were high compared to low in approach motivation were rated as more satisfied in their relationship and as more responsive to their partner’s needs (Impett et al., 2010). Also, individuals who scored high com- pared to low in avoidance motivation were rated as being less satisfied in their relationship and as less responsive to their partner’s needs. Moreover, it was particularly dissatisfying to be in a relationship with a partner who was merely focused on avoiding negative outcomes in the relationship. In line with these findings, Kuster et al. (2017) showed that individuals who endorsed approach goals reported fewer relationship problems, more effec- tive stress communication, and better dyadic coping compared to people endorsing avoidance goals. Further, people with strong approach goals tended to perceive their partners as being more supportive, whereas people with strong avoidance goals tended to perceive their partner as less supportive. The authors concluded that the orientation toward approach and avoidance goals, respectively, are key features in understanding relationship maintenance. In the next sections, we discuss the cognitive, emotional, and behavioral processes of social approach and avoidance motivations that might underlie relationship initiation and maintenance.

### Cognitive, Emotional, and Behavioral Processes of Social Approach and Avoidance Motivations

##### Cognitive Processes

*Perception and interpretation of social stimuli*. With respect to attentional and perceptual processes, social avoidance motivation is related to enhanced processing of negative information. A study on the startle reflex with young participants showed that avoidance motivation was positively associated with greater attention to pictures with rejection themes (Downey et al., 2004). The authors interpreted this finding as an automatic activation of the defensive motivational system by rejection cues. Similarly, a study on cognitive processing of emotional information with undergraduates found a positive relationship between avoidance motivation and enhanced processing of negative information in a word fragmentation task, a word‐recognition task, and in a free word‐recall task (Gomez & Gomez, 2002). Results of a gaze‐time paradigm with younger (*M* = 25.5 years, *SD* = 2.9) and older participants (*M* = 70.5 years, *SD* = 5.7), showed that irrespective of age, avoidance motivation was positively associated with gaze preference for angry faces and negatively associated with gaze preferences for happy faces (Nikitin & Freund, 2011). Moreover, avoidance motivation was related to spending more time looking at angry faces compared to neutral and happy faces in this study.

As for interpretational processes, avoidance motivation was found to be related to an emphasis of potential threats in the environment: In two studies using written social information, avoidance motivation was associ- ated with better memory for negative information and a negatively biased interpretation of ambiguous social cues in samples of undergraduates (Strachman & Gable, 2006). Similarly, research with young adults showed that avoidance motivation predicted the interpretation of ambiguous facial expressions: Participants with high levels of avoidance motivation interpreted ambiguous (poorly visible) faces more often as angry than partici- pants with low levels of avoidance motivation (Nikitin & Freund, 2015b). The authors explain these findings by a combination of: (1) greater initial attention to negative social cues; (2) longer attention to negative social cues; and (3) greater emphasis of negative social cues compared to other cues. It seems that persons who are most afraid of having negative social interactions (i.e., those high in avoidance motivation), anticipate and interpret social information in the most negative way.

In contrast, approach motivation only seems to play a marginal role in the interpretation of positive and negative social information (Nikitin & Freund, 2015a; Strachman & Gable, 2006). However, some studies with participants of different ages have demonstrated that approach motivation is related to posi- tive reproductions and interpretations of neutral statements (Gomez & Gomez, 2002; Strachman & Gable, 2006), to positive perceptions of everyday social interactions (Nikitin et al., 2012), and to weighing positive aspects of relationships more heavily (Gable & Poore, 2008). One proposed mechanism by which people high in approach motivation engage in more positive events is thus by seeing potential social rewards in neutral stimuli (Strachman & Gable, 2006) and by emphasizing the positive aspects of relation- ships (Lin et al., 2019). Gable (2006, see also Gable & Gosnell, 2013) suggested that an approach motiva- tion is linked to social outcomes through the increased exposure to positive social events, whereas avoidance motivation is linked to social outcomes through more intense reactions to negative social events when they inevitably occur.

*Attribution of social success and failure*. In addition to attentional and interpretational factors of social information processing, research demonstrates that approach and avoidance motivations influence not only whether a social situation is interpreted as a success or a failure, but also what the social success or failure is attributed to (Schoch et al., 2015). Using social scenarios as well as actual social interactions with both younger and older participants, Schoch and colleagues found that approach motivation was associated with attributions following social acceptance, whereas social avoidance motivation was associated with attributions following social rejection, irrespective of age: Whereas social approach motivation was related to self‐serving attributions after scenarios of social acceptance (i.e., attribution of social acceptance to internal “I am a likeable person,” stable “I always have nice encounters,” and global causes “People are generally friendly”), avoidance motivation was

related to self‐defeating attributions after scenarios of social rejection (i.e., attribution of social rejection to internal “I am an unlikeable person,” stable “I never have nice encounters,” and global causes “People are generally unfriendly”). The authors concluded that approach motivation intensifies the experience of positive (but not negative) social outcomes, whereas avoidance motivation intensifies the experience of negative (but not positive) social outcomes.

Motivation‐related attributions of social success and failure also play an important role for the initiation of romantic relationships in young adults (Nikitin et al., 2019). In line with previous reported findings, approach motivation predicted self‐serving attributions after acceptance, whereas avoidance motivation predicted self‐ defeating attributions after rejection in a speed‐dating scenario study. Attributions, in turn, predicted expecta- tions for an upcoming speed‐dating event and, consequently, the decision to participate in the speed‐dating event. The authors concluded that approach and avoidance motivations influence relationship initiation indi- rectly through differential attributions of social success and failure and the associated expectations for similar future events.

In sum, research on the association between approach and avoidance motivations, respectively, and cognitive processes has shown that approach and avoidance motivations are independent motivational orientations that differ in their associations with the perception, the interpretation, and the attribution of social situations. Whereas social avoidance motivation is mainly predictive of negative cognitions (i.e., greater attention to and better memory for negative social information, self‐defeating attributions after social rejection) in negative social situations, social approach motivation is mainly predictive of positive cognitions (i.e., positive interpreta- tion of neutral stimuli, self‐serving attributions after social acceptance).

##### Behavioral Processes

Focusing on behavior in social situations, social avoidance motivation is related to passive and inhibited behav- ior (Nikitin & Freund, 2010, 2015b). People high in avoidance motivation avoid eye contact and talk less in social interactions (Nikitin & Freund, 2010). Moreover, avoidance motivation is negatively associated with the focus on others’ needs during social interactions (i.e., responsiveness; Nikitin & Freund, 2019b), particularly when these interactions evoke negative feelings (Lin et al., 2019). Such avoidance‐oriented behaviors make social interactions difficult (Nikitin & Freund, 2015b) and can facilitate a self‐fulfilling prophecy: Avoiding eye contact, verbal output, standing on the periphery, and not being responsive might be viewed by others as disin- terest in social interaction (Vorauer et al., 2003). This, in turn, could explain why highly avoidance‐motivated individuals are judged less positively by others (Nikitin & Freund, 2015b).

In contrast, approach motivation is associated with self‐confident, active and friendly behavior in social situ- ations (Gable, 2006; Mehrabian, 1994; Nikitin et al., 2012; Nikitin & Freund, 2010). More specifically, approach motivation is positively related to the duration of speech in social interactions, the involvement of all group members in spontaneous and friendly exchange, positioning oneself closer to others, smiling more, and show- ing more eye contact (McAdams, 1992; Nikitin & Freund, 2010). Further, approach motivation is positively associated with high attention to the needs of social interaction partners (i.e., high responsiveness; Lin et al., 2019; Nikitin & Freund, 2019b). As a consequence of this approach‐related behavior, people high in approach motivation are perceived favorably by others and are preferred interaction partners (Nikitin & Freund, 2015a). The self‐confidence and friendliness of approach‐motivated individuals seem to “spill over” to their social part- ners (Mehrabian, 1994).

##### Emotional Processes

As social approach motivation is associated with attention and interpretation processes that benefit positive social information, active approach behavior, and social success, one can assume that it leads to positive emotions in social situations. In contrast, avoidance motivation is associated with attention and interpretation processes that benefit negative social information, passive vigilant behavior, and social failure. Thus, it might

lead to negative emotions in a social situation. Accordingly, Elliot and colleagues (2006) found that approach friendship goals predicted high positive and low negative affect. In contrast, avoidance friendship goals pre- dicted loneliness and the impact of negative relational events on well‐being. In social interactions with stran- gers, Nikitin and Freund (2010) found that approach motivation was positively associated with positive emotions such as happiness. In contrast, avoidance motivation was positively related to nervousness. In diary studies, people high in approach motivation reported high levels of subjective well‐being (Nikitin & Freund, 2019b) and feelings of social integration (Nikitin & Freund, 2018), whereas people high in avoidance motivation reported low levels of subjective well‐being (Nikitin & Freund, 2019b) and feelings of social isolation (Nikitin & Freund, 2018). With respect to intimate relationships, Gable and Poore (2008) found that people high in avoid- ance motivation are less satisfied with their relationships compared to people high in approach motivation. Taken together, avoidance motivation seems to be associated with negative emotional experiences, whereas approach motivation seems to be associated with positive emotional experiences.

##### Interplay of Social Approach and Avoidance Motivation

So far, we have reported empirical findings on the consequences of social approach and avoidance motivation separately. However, approach and avoidance motivation can cooccur. How does this cooccurrence affect social cognition, behavior, and emotion? Nikitin and Freund (2008) suggested that both approach and avoidance motivation result in equally high sensitivity to positive and negative incentives and, consequently, in emotional ambivalence. In line with this suggestion, Nikitin and Freund (2010) showed in a social interaction study with a sample of university students that the cooccurrence of high approach and high avoidance motivation was associated with both high arousal and high positive emotions. The authors concluded that individuals high in both approach and avoidance motivation are highly engaged and make a great effort to succeed in social con- texts. They are happy to be able to socialize, but also aroused because they fear the rejection of others. These findings are in line with previous research: For instance, high approach and high avoidance motive was associ- ated with dependency on others (Mehrabian, 1994). Although dependent persons were easily hurt by others, at the same time they were friendly and outgoing, suggesting both negative and positive consequences of the cooccurring motive.

In addition, high sociability and high shyness (indicating a cooccurrence of social approach and avoidance motivation) predicted risk for substance use in some cultural contexts (e.g., Santesso et al., 2004). Others have argued that high sociability and high shyness might lead to risky and antisocial behavior (Schmidt, 2009). It has been reasoned that higher substance use and risky behavior might help high‐sociable/high‐shy individuals to cope with the tension of their approach‐avoidance conflict that they experience in social interactions (Cheek & Buss, 1981; Schmidt, 2009). This interpretation is in line with research suggesting that the cooccurrence of social approach and avoidance motivation is associated with high intensity of emotional experiences such as in a study of undergraduates, who, when reporting to be both highly shy and highly sociable, exhibited patterns of frontal electroencephalographic activity suggesting high intensity of affective experience (Schmidt, 1999; Tang et al., 2014).

Taken together, the combination of high approach and high avoidance motivation has been found to be associated with intense and ambivalent experiences and behavior. However, this ambivalent experience is not necessarily maladaptive. For example, when both approach and avoidance motivations are high, approach motivation buffers the otherwise negative outcomes of avoidance motivation (Nikitin & Freund, 2019b). In contrast, the most detrimental outcomes result when high avoidance motivation is accompanied by low approach motivation. In their developmental transition study, Nikitin and Freund (2017) found that university students high on avoidance and low on approach motivation reported high levels of loneliness up to two years after the transition to university, whereas students high on avoidance and high on approach motivation adapted to the transition relatively rapidly. In other words, students with a combination of high avoidance and low approach motivation suffered from the negative effects of avoidance motivation but did not profit from the positive effects of approach motivation. The authors concluded that this combination might lead to a chronic experience of loneliness (see also Cacioppo & Hawkley, 2005; Spithoven et al., 2017).

### The Origins and Development of Social Approach and Avoidance Motivation Across the Life Span

##### Biological Substrates

Social approach and avoidance motivations do not tend to be an emphasis of genetic research, although there seems to be biological substrates of social approach and avoidance motivations. Biological tests of (social) approach and avoidance motivations are based on frontal electroencephalographic (EEG) asymmetry (Davidson et al., 1979). Frontal EEG asymmetry has been used as an index of approach and withdrawal (i.e., avoidance) motivation (see Reznik & Allen, 2018). According to the approach‐withdrawal model, increased activation in the left frontal cortex is associated with increases in appetitive, approach‐related behavior. The approach sys- tem includes emotions like joy, interest, and anger. Increased right frontal activation is related to increases in defensive, withdrawal‐related behavior. The withdrawal system includes emotions like fear and disgust. In addi- tion to using frontal EEG asymmetry as a state measure, researchers have also investigated its use as a trait measure of people’s tendency to respond in a motivationally biased manner (Bauriedl‐Schmidt et al., 2017). The approach‐withdrawal theory of frontal EEG asymmetry proposes that people with greater resting right frontal activation have stronger withdrawal/inhibitory tendencies and that those with greater resting left fron- tal activation are more vulnerable to experiencing stronger approach tendencies (Davidson, 1995).

Studies that have examined the role of frontal EEG asymmetry in infant temperament have found that young children with right frontal EEG asymmetry were more likely to exhibit social withdrawal and behave in a socially maladaptive manner when interacting with unfamiliar peers (e.g., Fox et al., 2001). This pattern of frontal EEG asymmetry can be identified in infants as young as nine months of age and it predicts social with- drawal or reticence in preschool‐ and school‐age children. In addition, children who display stable patterns of behavioral inhibition over time also exhibit stable right frontal asymmetry (Fox & Reeb, 2008). Moreover, EEG frontal asymmetry interact with childhood adverse circumstances (e.g., maltreatment) in prediction of low‐grade inflammation in midlife (Hostinar et al., 2017). Inflammation, in turn, is linked to morbidity and mortality (Black, 2003).

Regarding specific brain regions, behaviorally inhibited individuals show heightened amygdala activation in response to novel and threatening stimuli (Fox et al., 2005) and enhanced activity in the striatum in response to rewards and punishments (Helfinstein, Fox & Pine, 2012). It seems that the amygdala activation is particularly linked to attentional processes (enhanced sensitivity to novel and threatening stimuli), whereas the activation of striatal structures is particularly linked to avoidance behavior associated with behavioral inhibition (Helfinstein et al., 2012).

Although these findings point to biological underpinnings of social approach and avoidance motivations, the heritability of frontal EEG asymmetry seems relatively low (ranging between 11% and 30% of variance; Anokhin et al., 2006; Gao et al., 2009). Thus, environmental factors may play a substantial role in the develop- ment of frontal EEG asymmetry.

##### Environmental Influences

One of the most prominent environmental factors that might play a role in the development of social approach and avoidance motivations is the quality of maternal care (Peltola et al., 2014). For instance, Hane and Fox (2006) found that infants who received high‐quality maternal care displayed decreased right frontal activation as compared to those who received low‐quality maternal care. In contrast, infants receiving low‐quality mater- nal care showed more fearfulness, less positive joint attention, and greater right frontal EEG asymmetry than those receiving high‐quality maternal care. The pattern of fearfulness, low sociability, and right frontal EEG asymmetry found in the low‐quality maternity care group has been identified in infants displaying negative reactivity to novelty and behavioral inhibition during the early years of life (Fox et al., 1995, 2001). However, the direction of the relationship is not clear: Infants’ negativity may also influence the quality of mother‐infant interaction as has been reported in the developmental literature (e.g., Atzaba‐Poria et al., 2017). In addition, it

is important to note that EEG asymmetry is a biological marker, not a direct measure of approach or avoidance motivation.

Regarding the role of maternal care for social withdrawal, social withdrawal based on the approach‐ avoidance conflict seems to be associated with either low authoritative parenting (low warmth, reasoning, and democratic participation) or overprotectiveness (being anxious and intervening; Coplan et al., 2004): Too little and too much parental care might lead children to develop shyness characterized by an approach‐ avoidance conflict probably because in both cases children do not learn to cope with interpersonal situa- tions (either because of too much or too little parental regulation). Social disinterest (or low approach motivation) is unrelated to parental behavior but associated with maternal social goals. Mothers who place less importance on children’s sociability and peer relations have children who are socially disinterested (Coplan et al., 2004). Supporting the causality of the relationship between maternal social goals and chil- dren’s motivation, Grady and Karraker (2014) found that when mothers of shy children encouraged their children to play with peers, it reduced social reticence in their shy children. These findings point to the possibility that approach motivations and approach‐avoidance conflict might have origins in different environmental factors.

However, environmental factors and children’s temperament may also interact in the development of social approach and avoidance motivations. In fact, a growing body of literature indicates that temperament and maternal behavior act in concert to shape development (e.g., Calkins, 2002; Hane et al., 2008; Hostinar et al., 2017). For instance, Hane and colleagues (2008) observed the behavior of children during play with unfa- miliar peers at the age of four and seven. In addition, mothers and their seven‐year‐old children were observed during structured and unstructured activities. Maternal positivity and negativity differentially influenced the development of social withdrawal in childhood. Specifically, maternal negativity was associated with poor social functioning in children who had an established history of social withdrawal, whereas maternal positivity was associated with better social outcomes for similarly socially withdrawn children. Likewise, Coplan and col- leagues found that the relationship between child’s social withdrawal and maladjustment was moderated by mother’s personality and parenting style (Coplan et al., 2008). These findings suggest that generalized levels of maternal positivity and negativity moderate the relationship between temperamental predisposition and overt expressions of social avoidance motivation.

##### Developmental (In)Stability in Childhood

The above findings suggest that environmental factors, such as the quality of maternal care, may buffer or amplify the temperamental predisposition to develop behavioral manifestations of social avoidance motiva- tion. In line with the behavioral findings, EEG asymmetry also seems to change as a result of experiential fac- tors. For instance, Fox et al. (2001) found that children who had originally displayed a right frontal bias and had become less inhibited over time displayed a change from right to left frontal asymmetry. The authors screened four‐month‐old infants for temperamental patterns (motor reactivity and affect expression patterns) thought to predict behavioral inhibition and selected a subsample that was identified as displaying high motor reactivity and high negative affect in response to novelty. This group was followed over the course of four years and slightly over a quarter of it was found to display a pattern of continuously inhibited behavior. A similar number of infants were no longer inhibited at the age of four. The remaining children showed no discernable pattern over time. In addition, infants who remained inhibited over the four‐year period exhibited stable right frontal EEG asymmetry while infants who changed exhibited a shift from left to right frontal EEG asymmetry. These findings point to the possibility of developmental changes in the behavioral manifestations of social avoidance motivation and their biological markers.

With respect to the independent development of approach and avoidance motivations, Kagan and Snidman (1991) found some support for the argument that inhibited and uninhibited children belong to qualitatively different groups rather than representing extremes on a single dimension. The combination of high motor activity and frequent crying at four months best predicted high levels of fear later on. Children who showed

high levels of motor activity but no distress were much less fearful. Similarly, children who were low in motor activity but very irritable were more fearful than infants who displayed both low levels of motor activity and minimal crying. These findings are in line with the idea of independent approach and avoidance motivational systems.

Other studies growing out of the two‐factor model of inhibition (Asendorpf, 1990b) have explored the interplay of approach and avoidance motivations in childhood (see Coplan & Rubin, 2010; Rubin et al., 2002). Asendorpf (1990a,b) differentiated between children who are socially withdrawn because they experience an approach‐avoidance conflict and children who are socially withdrawn because they are socially disinterested. This differentiation was supported by empirical evidence. Interestingly, the consequences of social withdrawal seem to be negative regardless of the underlying motivation. For example, Guedeney and colleagues (Guedeney et al., 2014) demonstrated that social withdrawal in the first year of life predicted behavioral problems two and four years later, independently of the child’s temperament or familial factors. Similarly, Coplan and col- leagues (Coplan et al., 2013) found that all socially withdrawn children reported negative peer relationships. The authors conclude that socially withdrawal behaviors – irrespective of its origin – appear to be a marker for social difficulties.

##### Developmental (In)Stability Beyond Childhood

*Adolescence and young adulthood.* As discussed above, dispositional approach and avoidance motivations in childhood have a biological basis and are the result of an uninhibited or inhibited temperament, respectively, and environmental factors such as the quality of maternal care. It seems that inhibited infants are at a slightly higher‐than‐normal risk for the later development of some form of anxious symptomatology (Clauss & Blackford, 2012). For instance, behavioral inhibition assessed via maternal report throughout infancy and early childhood was associated with four times increased risk for social anxiety disorder in adolescence (Essex et al., 2010). Conversely, college students who reported high levels of social anxiety remembered being inhibited when they were young children (Mick & Telch, 1998). Similarly, a longitudinal investigation of the development of anxious‐depressed behavior demonstrated that less sensitive parenting in infancy and middle childhood predicted more inhibited behavior in adolescence, which in turn predicted more internalized behavior problems in adolescence (van der Voort et al., 2014).

Thus, behavioral and physiological features of behavioral approach and avoidance appear to be moderately stable from infancy into early adolescence. Some research suggests that this might especially be the case for extreme groups, whereas in the middle of the distribution, the development is characterized more by change than by stability (Pfeifer et al., 2002). However, more recent research has challenged this view by demonstrating that parental sensitivity is more strongly predictive for later adjustment of children with difficult as compared to easy temperament (Bates & Pettit, 2015; see also Lengua & Wachs, 2012). It seems that children with difficult temperament are more sensitive to context variables than those with easy temperament (Bates & Pettit, 2015). More research and new methods (Petersen et al., 2018) are needed to understand the differential effects of envi- ronmental factors for children of different temperaments.

*Middle adulthood and old age.* To date, little is known about the development of approach and avoidance motivations beyond young adulthood. There is some support in the literature for the assumption that interindividual differences in motivation in general may be relatively stable across the life span. In two surveys, Veroff et al. (1984) found in a cross‐sectional comparison that the strength of the motives was remarkably similar across age groups. Similarly, in a longitudinal study on motive development, Franz (1994) found evidence for both stability of and change in motives across middle adulthood. Focusing on the role of the closeness of the relationship, Nikitin and Freund (2019b) found that older (compared to middle‐ aged and younger adults) reported higher levels of avoidance goals in peripheral but not close relationships. The authors argue that peripheral social relationships are less predictable and, thus, bear the risk of being

negative. Negative emotions that are elicited through negative social interactions detract from older people’s well‐being and health (Rook & Charles, 2017), which motivates older people to develop avoidance goals in peripheral social relationships.

##### Beyond Developmental Stability: Implications of Social Approach and Avoidance Motivations Across Adulthood

Individual differences can be operationalized either quantitatively or qualitatively (Caspi & Moffitt, 1993). Quantitative differences are related to differences between individuals on a single trait dimension (i.e., mean‐ level differences as discussed above). However, individuals can also differ with respect to how well traits predict trait‐related outcomes (i.e., qualitative differences). There are good reasons for expecting either decrease, stabil- ity, or increase in the impact of approach and avoidance motivations on social outcomes across adulthood. Speaking for a *decrease* in the impact of approach and avoidance motivations on social outcomes across adult- hood, older adults show greater motivation to regulate their emotions (e.g., Gross et al., 1997). Their emotion‐ regulation efforts might override the effects of dispositions. Speaking for an *increase* in the impact of approach and avoidance motivation on social outcomes across adulthood, the effects of dispositions might become stronger over time due to cumulative processes (Impett et al., 2010). Finally, the *stability* hypothesis of stable effects of dispositions over time is based on Neugarten’s (1964) notion of the institutionalization of personality, which assumes that personality traits and their interaction with the social environment stabilize with age (Isaacowitz, 2005).

Speaking for stability, social approach and avoidance motivation are – irrespective of age – associated with processing of emotional faces (Nikitin & Freund, 2011), daily subjective well‐being in close social relationships (e.g., the spouse, the best friend, closest family; Nikitin & Freund, 2019a), experience of important social transi- tions (Nikitin et al., 2012), responsiveness (Nikitin & Freund, 2019a), and attributions of different social out- comes (Schoch et al., 2015). Thus, it appears that social approach and avoidance motivation continue to exert an important influence on social outcomes well into old age.

On the other hand, there is also empirical evidence supporting the hypothesis that the adaptivity of approach motivation decreases and the adaptivity of avoidance motivation increases with age. In the previously outlined study (Nikitin & Freund, 2019b), younger (but not older) adults who reported higher levels of approach moti- vation in peripheral social relationships (e.g., relationships with acquaintances or coworkers) were subjectively more happy, satisfied, and healthy on the daily basis, whereas older (but not younger) adults who reported higher levels of avoidance motivation in peripheral social relationships were those who were subjectively more happy, satisfied, and healthy. Similarly, when interacting with a stranger, younger adults were more strongly affected in their experience of the interaction by experimentally induced approach goals, whereas older adults were more strongly affected by experimentally induced avoidance goals (Nikitin et al., 2014).

These findings have been explained by different developmental tasks in young and older adulthood (Bühler et al., 2019; Nikitin & Freund, 2018, 2019b). Young adults’ developmental tasks are largely associated with accu- mulation of (social) resources (e.g., Nurmi, 1992); tasks for which approach motivation seems to be essential (Gable, 2006; Nikitin & Freund, 2015a). In contrast, avoidance motivation makes it more difficult to establish new social relationships (Nikitin & Freund, 2017), rendering avoidance motivation detrimental for develop- mental tasks in young adulthood. As people get older, a focus on the maintenance of achieved social roles outweighs the motivation to expand (Freund & Ebner, 2005; Hutteman et al., 2014), rendering approach moti- vation in peripheral (but not close) social relationships less adaptive and avoidance motivation less maladaptive. Supporting this developmental‐tasks explanation, Nikitin and colleagues found in the aforementioned transi- tion study (Nikitin et al., 2012) that for both young and older adults, approach and avoidance motivations were more strongly associated with the experience of the transition, the less time had elapsed since the transition. In other words, when older adults are confronted with tasks that are typical for young adulthood (such as being in a transition that requires establishing new social relationships and taking up new social roles), approach and avoidance motivations are similarly (mal)adaptive as in young adulthood.

### Implications for Interventions

In the present chapter, we discussed social approach and avoidance motivations, their underlying processes, and development. Distinguishing approach and avoidance motivations and their possible cognitive, emotional, and behavioral concomitants and consequences help us to describe and explain different patterns of behavior and experience in social situations across the life span. Future research needs to address how maladaptive cogni- tive, emotional, and behavioral concomitants of social avoidance motivation could be altered in order to reduce social failure and loneliness. Note that although approach and avoidance motivations have biological underpin- nings, there is also evidence suggesting that the motivations and their biological markers are malleable and can change across the life span (as discussed in the previous sections). Such findings suggest that the motivations can be objects of interventions.

Previous intervention studies indicate the effectiveness of targeting cognitions and beliefs that lie at the heart of interpersonal patterns. Walton and Cohen (2007), for example, developed an experimental interven- tion aimed to increase people’s expectations of acceptance. Changing people’s expectations of acceptance had significant positive effects on self‐confidence, resilience, and even academic success. In line with these findings, Aronson et al. (2002) demonstrated in an intervention study that college students who learned about the malleability of personal attributes (such as intelligence) showed a higher valuation of their courses and studies, enhanced enjoyment thereof, and higher grade‐point averages. According to Dweck (2008), these interventions all speak to the effectiveness of targeting cognitions. Changing self‐theories, or cogni- tions about oneself, appears to result in important real‐world changes in how people function. For example, individuals who think that their shyness is malleable as compared to individuals who see their shyness as unchangeable view social situations as learning opportunity, are less likely to avoid social interactions, and report less negative consequences of their shyness (Beer, 2002). Moreover, cognitive interventions have been found to be successful in changing many of the personality traits that are often thought to be relatively sta- ble across adulthood, such as sociability (e.g., reach out to others) or negative affectivity (e.g., positive vs. negative reactions to setbacks; Dweck, 2008). Based on these findings, we would suggest interventions that focus on changing people’s cognitions about social situations in order to reduce social failure and loneliness.

Changing people’s cognitions alone may not be sufficient to bring about a stable change in behavior. Thus, behavior should also be addressed in interventions. One of the most direct modes of intervention would be to use our knowledge about the behavior associated with approach motivation (such as actively approaching others, talking to others, engaging in self‐disclosure) and to apply it to the develop- ment of training programs for socially avoidant individuals. There is increasing empirical evidence that approach motivation can buffer for the negative consequences of avoidance motivation (Nikitin & Freund, 2010, 2015b, 2017).

However, we do not claim that approach cognitions, emotions, and behaviors are always adaptive, whereas avoidance cognitions, emotions, and behaviors are always maladaptive. There are situations in which avoidance goals and means are more adaptive (e.g., when you have to bring up a difficult topic with a friend) and others in which approach goals and means are more appropriate (e.g., when you want to have a fun evening with your new colleagues). It would therefore make sense to include discrimination tasks in interventions that teach peo- ple to discriminate between social situations in which approach strategies are more appropriate than avoidance strategies and vice versa. In a second step, the interventions should provide training in appropriate approach and avoidance strategies as well as focus on cognitive aspects.

Moreover, future studies should systematically investigate when across the life span such training programs would be most successful and meaningful. In the present chapter, we reported research on age‐differential effects of approach and avoidance motivations that illustrate that the context of social motivation might be an important variable with this regard. Trainings that aim at establishing new social relationships and accumulat- ing social resources might be most important in young adulthood but also in situations in which older adults encounter situations that require establishing new social relationships and taking up new social roles (e.g., in transitions such as moves or when entering retirement). In contrast, trainings that aim at social functioning in

close social relationships might be helpful across adulthood, as the influence of approach and avoidance moti- vation on social outcomes in close relationships and basic attentional and cognitive processes has been found to be relatively stable across the life span.

### Conclusions and Future Directions

Taken together, there are substantial cognitive, behavioral, emotional, neuropsychological, and developmental differences between social approach and avoidance motivations, suggesting that the motivations are theoreti- cally different and not simply inverse. To date, we know less about the processes and development of social approach motivation than about social avoidance motivation. This discrepancy in the research is probably based on the fact that the consequences of avoidance motivation, unlike those of approach motivation, are detrimental for the individual. However, learning more about the processes and development of approach motivation would help us to understand what leads to well‐functioning and satisfying relationships across the life span.

In addition, there is relatively little experimental evidence examining the causality between social approach and avoidance motivations and their outcomes. Experimental studies would also help to understand for whom and under which circumstances social approach and avoidance motivations are (mal)adaptive. This would ena- ble us to develop a more fine‐grained view of social approach and avoidance motivations.

Finally, relatively little is known about the roots of age‐differential outcomes of social approach and avoid- ance motivation. Although it has been argued that different developmental tasks might lead to different adap- tivity of social approach and avoidance motivation (Bühler et al., 2019; Nikitin & Freund, 2018, 2019b), this hypothesis has not been empirically tested. Therefore, future research should explore whether social approach and avoidance motivations serve different functions across the life span.

# Ostracism and Solitude

Ostracism – being ignored and excluded – is a social phenomenon that occurs in a myriad cultures and contexts among humans and also nonhuman social animals (Williams, 2009). Records throughout human history reveal ritualized ostracism, ranging from prehistorical tribal humans to the ancient Greeks and modern‐day Amish communities (Williams, 2001). Institutional practices such as incarceration, excommunication, political exile, and even the disciplinary practice of giving children *time‐outs* are also examples of ritualized ostracism (Williams, 2001). Many instances of ostracism, however, are not ritualized; they include any instance in which individuals perceive themselves to be ignored and excluded and can encompass seemingly trivial behavior (e.g., mean‐spirited laughter, a lack of eye contact, or uncomfortable silences; see Wesselmann et al., 2016, for review). Evolutionary theory offers an explanation for the robustness of ostracism in human society and its occur- rence within groups of other social animals. Social scientists have argued that ostracism served useful functions in humans’ evolutionary past (Kurzban & Leary, 2001; Williams, 2009). Groups of humans and other social animals use ostracism as a form of social control to deal with deviant or burdensome group members, thus strengthening the group by motivating individual members to obey norms and to contribute to the collective

(e.g., Kurzban & Leary, 2001; Wesselmann, Wirth et al., 2013).

A scientific study of ostracism often takes one of two main perspectives – studying the functions of ostra- cism (Wirth & Wesselmann, 2018) – or studying the experience of being ostracized (Williams, 2009). In this chapter, we focus on the research examining the perspective of individuals who are ostracized. We first review a theoretical model for studying the effects of ostracism and discuss data that support this model. Next, we discuss new areas of studying ostracism that are in their infancy but offer exciting new directions for research- ers. Finally, we propose that ostracism research should consider situations in which individuals *self‐ostracize*, voluntarily removing themselves from social interactions as a way to seek solitude.

##### Overview of Ostracism

Ostracism has received substantial attention in social psychology over the past two deacades. The terms ostra- cism, social exclusion, and rejection are often used synonymously in the extant research, even though there are debates about their similarities and differences (e.g., Smart Richman & Leary, 2009; Wesselmann & Williams, 2017). Most of the debates about these constructs have been theoretical with little empirical evidence

to suggest differential effects (but see Molden et al., 2009; Rudert et al., 2017). We acknowledge these debates but choose to use the term *ostracism* throughout this chapter for simplicity when discussuing various studies on these closely related constructs.

Ostracism is a painful event that the majority of individuals experience in minimal forms daily and often in meaningfully important forms at least once in their lives (Nezlek et al., 2012; Williams, 2009). Anecdotally, most individuals can probably recall at least one instance of being ostracized from a childhood peer group (see Ladd et al., Chapter 9). Ostracism can occur in three main modes of interaction – physical, social, and cyberostracism (Williams et al., 2000). *Physical* ostracism involves being separated physically from the oth- ers (e.g., incarceration, exile). *Social* ostracism involves being ignored and excluded while in the physical face‐to‐face presence of others, such as being given the “silent treatment” (Williams, 2001) or being ignored by someone who is using their cellphone during an interaction (i.e., “phubbing;” Chotpitayasunondh & Douglas, 2018; Hales et al., 2018). *Cyberostracism* occurs via electronic media where recognition and com- munication is anticipated but does not occur within an expected time frame (e.g., ignored email, texts; e.g., Smith & Williams, 2004) or not receiving the desired feedback on social media posts (Hayes et al., 2018; Wolf et al., 2015). This form of ostracism also includes being “ghosted,” or completely ignored, on social media (e.g., Freedman et al., 2019). Most experimental psychological research has focused social and cyberostracism.

Ostracism can be psychologically harmful to the target, leading to impaired self‐regulation (Baumeister et al., 2005; Oaten et al., 2008), self‐perceived dehumanization (Bastian & Haslam, 2010), decreased cogni- tive ability (Baumeister et al., 2002), and provoking negative physiological responses (e.g., heightened cortisol, cardiovascular difficulties; Gunnar et al., 2003; Moor et al., 2010). Furthermore, fMRI data demonstrates that ostracism activates the dorsal anterior cingulate cortex (dACC), a brain region associ- ated with experiencing physical pain (e.g., Eisenberger et al., 2003). Ostracism also increases negative moods and threatens individuals’ satisfaction of four basic human needs: belonging, control, meaningful existence, and self‐esteem (Williams, 2009).

##### Williams’s Temporal Model of Ostracism

Williams (2009) posits that individuals’ experiences of ostracism have a temporal structure, with personality and situational factors having differential effects over time. Williams’s (2009) model has three stages: reflexive, reflective, and resignation.

##### *Reflexive stage.* Humans likely evolved to detect the slightest cues of ostracism, which helped them forestall or avoid permanent expulsion (e.g., Wesselmann et al., 2012). After individuals detect these cues, their reflexive responses are characterized by immediate pain and threatened need satisfaction. Typical research on the immediate effects of ostracism uses self‐report scales to measure need threat and negative affect, but others also have measured physiological and brain activity (e.g., Eisenberger et al., 2003; Gunnar et al., 2003).

The reflexive effects of ostracism have been observed to occur regardless of whether the mode of ostracism is social (Williams & Sommer, 1997) or cyber (Smith & Williams, 2004; Williams et al., 2000). Other research sug- gests simply observing the ostracism of another individual can elicit vicarious distress in the observer (e.g., Giesen & Echterhoff, 2018; Wesselmann, Williams et al., 2013). The power of ostracism is not limited to current occur- rences; data suggest that need threat occurs when individuals recall a past ostracism episode (Chen et al., 2008).

Ostracism’s reflexive effects have been resistant to moderation by several individual differences and situ- ational factors (Williams, 2009; but see Rudert & Greifeneder, 2016; Wirth et al., 2010). Ostracism still threatens need satisfaction when participants are told the ostracism was unintentional or even planned by the experimenters (Eisenberger et al., 2003; Zadro et al., 2004). Ostracism also hurts when being ostracized may be desirable, such as when the ostracizers are members of a hated out‐group (i.e., the Klu Klux Klan;

Fayant et al., 2014; Gonsalkorale & Williams, 2007), and when ostracism can be beneficial within the con- text of a game (van Beest & Williams, 2006; van Beest et al., 2011).

*Reflective stage.* Williams’s (2009) reflective stage of ostracism focuses on the recovery of an individual’s threatened basic need satisfaction, and this can begin within minutes after the initial effects of ostracism occur (Goodwin et al., 2010; Wirth & Williams, 2009). Research on the reflective stage has investigated both the personality and situational factors that influence recovery and behavioral responses facilitating recovery.

*Factors influencing recovery.* Research has demonstrated that group membership of the ostracized individual (and of the sources of ostracism) can affect recovery of need satisfaction. For example, ostracized participants who made attributions to a temporary group membership (i.e., minimal group assignment) recovered from ostracism quicker than participants who made attributions to a permanent group membership (i.e., gender; Wirth & Williams, 2009). Subsequent research extended these findings to permanent group membership (i.e., race), demonstrating that ostracized participants interpreting the treatment as racism recovered slower than those who did not make this attribution (Goodwin et al., 2010).

Another study examined how personality differences (i.e., social anxiety) influenced recovery from ostra- cism, and found that ostracized participants who had higher levels of social anxiety demonstrated less recovery after a 45‐minute period than those participants who had lower levels of anxiety (Zadro et al., 2006). The researchers suggested that rumination was a potential reason why socially anxious participants had depressed recovery. Subsequent studies directly examined the negative role that rumination has on recovery by either allowing participants to ruminate after the ostracism episode or by providing them a cognitive task before tak- ing the recovery measure (Wesselmann, Ren et al., 2013; Hales et al., 2016). These cognitive tasks varied across studies, from cognitive distraction tasks to more meaningful tasks such as those involving self‐affirmation or composing a prayer to one’s diety (for religious participants). Ostracized participants who performed a subse- quent cognitive task demonstrated better recovery than ostracized participants who simply sat and wrote about what they were thinking about while waiting for the recovery measure. Recovery benefits occurred regardless of the type of cognitive task. Further, participants indicated the degree to which they recalled ruminating on the ostracism episode. Interestingly, rumination mediated the effect of the distraction task on recovery, but not for the affirmation or prayer tasks; this suggests that each of these tasks facilitated recovery via different cogni- tive mechanisms. Thus, discouraging rumination via distraction is one way of helping individuals cope with ostracism, but it is not the only way. It may be useful in the moment, but it is unlikely that individuals simply will forget about the incident. Given that the social pain of ostracism can be relived (Chen et al., 2008), partici- pants may experience a rebound effect later when reflecting upon the incident. Perhaps encouraging individu- als to engage in cognitive tasks focused directly on fortifying the needs threatened by ostracism (such as through prayer or self‐affirmation) would lead to robust recovery. Thus far studies have not directly examined factors that may influence the longevity of recovery, so these ideas offer avenues for future research.

*Behavioral responses.* Williams (2009; Wesselmann et al., 2015) argues that individuals’ behavioral responses in the reflective stage serve to fortify threatened need satisfaction. Research has found two main types of responses to ostracism: pro‐ and antisocial behavior. Several studies suggest ostracized individuals may respond prosocially as a way to become reincluded. Ostracized individuals have been more likely to work harder on a collective group task (Williams & Sommer, 1997), conform to group norms (DeWall, 2010; Williams et al., 2000), focus on strategies for reinclusion (Molden et al., 2009), demonstrate increased compliance and obedience (Carter‐Sowell et al., 2008; Riva et al., 2014), and show interest in joining new groups (Maner et al., 2007) compared to included individuals. Ostracized individuals are also

more likely to engage in nonconscious behavioral mimicry (Lakin et al., 2008), and show improved attention to social information (Bernstein et al., 2010; Pickett et al., 2004) compared to included individuals. Interestingly, ostracized individuals also show an increased tendency to respond antisocially, regardless whether or not their target was involved in the ostracism (e.g., Twenge et al., 2001). Researchers have opera- tionalized aggression in a variety of ways such as negative evaluations to job candidates (Twenge et al., 2001), giving hot sauce to interaction partners who dislike spicy food (Warburton et al., 2006; another study exam- ined giving partners unappealing snacks, Chow et al., 2008), or giving aversive noise blasts to partners (Gaertner et al., 2008). These effects are likely driven by the increase in anger and hostile cognitions when ostracism

occurs (e.g., Chester & DeWall, 2017; Chow et al., 2008; Zhang et al., 2019).

How do researchers reconcile these paradoxical responses to ostracism? Williams (2009) argues that the specific type of behavioral response to ostracism corresponds to the main type of need individuals are motivated to fortify. Prosocial responses should be focused on fortifying *inclusionary* needs (i.e., belonging and self‐esteem) and aggres- sive responses should be focused on fortifying *power/provocation* needs (i.e., meaningful existence and control). Williams’ argument has not been tested directly, but several experiments provide indirect evidence. First, research- ers have investigated the aggressive behavior side of the paradox. One study demonstrated that ostracized partici- pants who had their need for control restored did not aggress any more than included participants; ostracized participants not given control restoration replicated the typical ostracism→ aggression effect found in previous research (Warburton et al., 2006). Subsequent research demonstrated that the link between the need for control and aggressive responses to ostracism can be bidirectional. For example, participants who were treated negatively during a group discussion were able to anticipate their subsequent ostracism, and these participants aggressed less than participants who were treated positively and then unexpectedly ostracized (Wesselmann, Butler, Williams, & Pickett, 2010). Further, there is evidence that ostracized individuals’ threatened need for control (but not the other needs) mediates the ostracism → aggression effect (Schoel et al., 2014). Taken together, these studies provide promising evidence for a link between control needs and aggression. The link between meaningful existence and aggression remains theoretical and needs further investigation.

Other research has focused on the pro‐social side of the behavioral paradox. For example, one program of studies found that ostracized participants who were either reminded of positive social relationships or had a pleasant interaction with an experimenter behaved less aggressively than participants who were not given these opportunities (Twenge et al., 2007). The ostracized participants who were given subsequent instances of social inclusion likely had their needs fortified; thus, there would be no need for them to agress in order to restore their needs. Even small amounts of inclusion in a group context can help individuals recover from ostracism, reducing their subsequent aggression (DeWall, Twenge et al., 2010). However, these studies focused on how subsequent inclusion can reduce the tendency for ostracized individuals to respond aggressively. They did not directly assess need satisfaction (inclusionary or power/provocation needs), nor did they assess links between these needs and pro‐social behavior. Only one study has provided direct evi- dence for a link between inclusionary needs and pro‐social responses, with results showing that ostracized participants’ levels of belonging and self‐esteem need satisfaction (i.e., inclusionary needs) mediated the link between ostracism and an individual’s desire to interact with potential sources of affiliation (i.e., pro‐social behavior; Bernstein et al., 2010). Future research should emulate this approach by both measuring the par- ticipants’ psychological need satisfaction and providing them with pro‐ and antisocial behavioral options together, rather than just one.

*Resignation stage.* Finally, Williams (2009) argues that if individuals experience ostracism chronically, then they decline into the *resignation* stage. Individuals in this stage may find that their attempts to restore their need satisfaction or forestall future ostracism futile. Thus, these individuals should experience an acceptance of these lost needs and suffer extreme outcomes: alienation (need to belong), depression (self‐esteem), learned helplessness (control), and unworthiness (meaningful existence). This third stage of Williams’s temporal model (2009) has received little empirical study, but preliminary evidence suggests that consistent exposure to ostracism can lead to extreme consequences. For example, qualitative interviews with individuals who reported enduring

chronic ostracism and the silent treatment found that these individuals indicated feelings of alienation, depression, giving up, and feeling worthless. Additionally, many reported eating disorders, suicidal ideation, and even suicide attempts (Zadro, 2004). These extreme outcomes converge with other research supporting a link between social isolation and extreme physical and mental health problems (e.g., Baumeister & Leary, 1995), demonstrating how this is an important area for future research.

##### Methods to Examine Chronic Ostracism

*Chronic ostracism and resignation.* Williams’s (2009) resignation stage is the newest stage in the theoretical understanding of experiencing ostracism – thus, it represents the largest area for future research. We propose that future research should focus on the scientific study of the resignation stage and its consequences using multiple methods. Psychological science favors experimental methods, but this type of research may prove difficult, because researchers cannot ethically and practically ostracize participants for an extended period of time. We suggest that research using animal models may offer a fruitful avenue for experimental research on chronic ostracism. Animal models have been useful in studying the effects of chronic stress in humans because many of these effects cannot be studied ethically or practically in human participants.

One animal model – the prairie vole – is a useful model to compare with humans because voles are social animals that form socially monogamous pair‐bonds, engage in biparental care of offspring, and have stress reac- tions similar to humans (Grippo, 2009). A common stress manipulation in research using this animal is to iso- late the vole socially for four weeks – this manipulation is similar to the concept of *physical* ostracism in humans (Williams et al., 2000). This research demonstrates that isolated voles are more likely than included voles to show depression‐like symptoms (Grippo et al., 2007), and learned helplessness (Grippo et al., 2008); each of these are theorized outcomes for chronic ostracism in humans (Williams, 2009). Research using animal models does have limited generalizability to human participants, and future research programs should combine these methods with human participant studies to elucidate fully the phenomena of chronic ostracism.

The most practical way of assessing chronic ostraicm in humans is using self‐report measures of individual differences in chronic ostracism and examine correlations with its theorized negative outcomes (i.e., alienation, depression, helplessness, and meaninglessness). One program of quasi‐experimental research (Riva et al., 2017) examined how individuals who self‐reported expericing chronic ostracism (three months or longer) compared to individuals who experienced various forms of physical ailments, as well as a healthy control group. This study provided preliminary survey evidence that chronically ostracized individuals experienced more feelings of alienation, depression, helplessness, and meaninglessness compared to those in the other conditions. Importantly, a subsequent experimental study demonstrated that chronic exclusion‐related outcomes do not occur when someone is experiencing an *acute* instance of exclusion. One limitation was that this study only used one self‐report item to categorize individuals into the chronic ostracism group. A more nuanced method could be to study chronic ostracism over time. For example, a study using event‐contingent daily diaries to assess the frequency with which ostracism occurs in participants’ daily lives found that daily instances of ostra- cism signfinicatly predicted participants’ daily feelings of basic need satisfaction (Nezlek et al., 2012). Unfortunately this study did not assess any chronic ostracism outcomes, but future researchers could utilize event‐contingent diary methods and extant chronic outcome measures (Riva et al., 2017).

Other researchers have developed individual difference measures to explicitly measure chronic ostracism in a variety of settings, all of which could also be used to predict theorized negative outcomes (Ferris et al., 2008; Gilman et al., 2013; Saylor et al., 2012). These measures have thus far been utilized in children, college students, and workplace samples, but may be used to assess potential links between chronic ostracism and its theorized outcomes in members of groups that traditionally are marginalized in mainstream society, such as the elderly or infirm individuals in institutionalized care (Goffman, 1961), persons with mental illness (Farina, 2000; Feldman & Crandall, 2007), homeless individuals (Hulme, 2000), and even combat veterans (McGraw, 2016). Research on each of these groups suggests that they experience ostracism, both in their interpersonal relation- ships and by society in general. To our knowledge, no studies have directly examined the dynamics of chronic

ostracism and Williams’s (2009) four theorized outcomes amoung these types of marginalized groups. However, one recent correlational study (Wesselmann et al., 2018) found that perceived chronic ostracism uniquely contributes to post‐traumatic stress symptoms and other negative mental health outcomes (i.e., anxi- ety and psychological well‐being). As such, it is reasonable to assume chronic ostracism may contribute to any feelings of alienation, depression, helplessness and meaninglessness that combat veterans may also experience, as well as any potential self‐injury or suicidal ideation that chronically ostracized individuals can experience (Williams, 2001, 2009).

Another potential group that would be fruitful for studying chronic ostracism is incarcerated individuals. Incarceration can be considered an institutional form of ostracism (Williams, 2001). In addition to protecting society from potentially dangerous individuals, an acknowledged function of prisons is to isolate inmates from society, thus motivating them to reflect on their misconduct and reform (Smith, 2008). Of course, it is plausible that this explicit isolation also causes feelings of ostracism. This isolation is analogous to *punitive* ostracism, which is focused on punishing targets to force them to correct undesirable behavior or to eject them from the group (Wesselmann, 2011; Williams, 1997).

However, individuals in prison have frequent daily contact with guards, fellow inmates, and even visitors (Arrigo & Bullock, 2008). These daily interactions may be enough to temper the effects of ostracism (see DeWall, McDonald et al., 2010; Twenge et al., 2007) and prevent these individuals from progressing to the resignation stage. The increasingly common practice of prolonged solitary confinement may offer the clearest insight into the nature of chronic ostracism in a prison setting. Solitary confinement typically consists of isolating a prisoner in a small room with no items. Prisoners are only permitted to leave their cells to shower and exercise in isolation, and are entirely dependent on guards for all of their physical needs. Solitary confinement can last for a few months or even years (Arrigo & Bullock, 2008). The lack of human contact, combined with an inability to engage in any purpose‐driven or meaningful activity, likely represent a severe and chronic threat to prisoners’ basic needs. Indeed, there have been calls to limit the use of solitary confinement (*Journal of Correctional Health Care*, 2016).

Research suggests solitary confinement has adverse effects on individuals’ mental health. Individuals in soli- tary confinement are more depressed (Haney, 2003), more likely to engage in self‐harm or commit suicide (e.g., Kaba et al., 2014; Way et al., 2007), and quicker to re‐offend after being released (Lovell et al., 2007) compared to those in the normal prison population (for a meta‐analysis, see Morgan et al., 2016). Further, the longer an indi- vidual is in solitary confinement, the more severe their mental health outcomes (Grassian & Friedman, 1986). These negative mental health effects are exacerbated when confined individuals do not know how long the isolation will last (Toch, 1992). Not only do the mental health outcomes for solitary confinement support Williams’s (2009) hypothesized outcomes for chronic ostracism, but individuals who face chronic ostracism often do not know how long it will last either (Williams, 2001). Research on the effects of solitary confinement share the same problems as extant research on chronic ostracism in that it is correlational in nature. Nevertheless, researchers should explore longitudinal patterns of mental health over the span of incarceration (e.g., Chadick et al., 2018), as well as patterns of mental health improvement as confined prisoners reenter the normal prison population, and when they are eventually reincluded in society.

*Interventions for chronic ostracism.* Because of harmful consequences of chronic ostracism, researchers should also investigate potential interventions for individuals who find themselves in the resignation stage. No direct studies have been conducted on treating these individuals, but there are studies that suggest fruitful treatment methods. Recent research demonstrates that individuals who take regular doses of *acetaminophen* experience dampened negative effects of ostracism in a laboratory setting (DeWall, McDonald et al., 2010). Subsequent studies have found that other chemicals with anelgisic effects, such as alcohol, marijuana, and psilocybin, can numb the effects of ostracism (Deckman et al., 2014; Hales et al., 2015; Preller et al., 2016).

Other research suggests *oxytocin* (a social‐affiliative hormone) can reduce the harmful effects of isolation in prairie voles (Grippo et al., 2009). One study (Pfundmair et al., 2014) examined the interaction between self‐construal and oxytocin in human particpants. The researchers found evidence that collectivistic‐oriented individuals (i.e., those individuals who emphasize social relationships over individual traits in terms of their self‐concept; Markus & Kitayama, 1991) who were ostracized and also exposed to oxytocin showed reduced

threat to their need satisfaction (i.e., belonging and self‐esteem) compared with those collectivistic‐oriented indivdiuals who were ostracized and in the placebo group. Further, any effects of oxytocin were diminished or absent among individualistic‐oriented individuals. These studies suggest hormonal cues of affiliation may help at least some individuals recover from single episodes of ostracism, especially if they have a collectivistic‐oriented self‐concept, likely because these hormones cue memories and feelings associated with social relationships.

There may be other interventions for chronic ostracism that would not require individuals to ingest biochemi- cal treatments, especially if there are practical or ethical reasons to avoid these methods. Previous research has found that being reminded of positive social relationships or even symbolic relationships (e.g., parasocial rela- tionships) can help individuals recover from the harmful effects of ostracism (Aydin et al., 2012; Gardner et al., 2005; Twenge et al., 2007). Even interacting with a robot or computer‐programmed chatbot can help people recover from ostracism laboratory manipulations (de Gennaro et al., 2020; Pfundmair, Eyssel et al., 2015). Other research has suggested that religious/spiritual beliefs and practices (e.g., prayer) may also serve to help individu- als fulfill the needs thwarted by ostracism (e.g., Hales et al., 2016). An important caveat must be stated – reli- gion/spirituality likely is only useful as an intervention for individuals who already hold these beliefs, and only for individuals who hold beliefs that their deity is inclusionary (George et al., 2020; van Beest & Williams, 2011). Further, these benefits may be exploited by destructive cults or other dubious organizations (Wesselmann & Williams, 2010).

Finally, social networking media provides potential for developing interventions for chronic ostracism. Research suggests that social networking web sites, email, and other modes of electronic‐based communication have afforded individuals the opportunity to form meaningful interpersonal relationships regardless of time or geographic limitations (Bargh & McKenna, 2004; McKenna & Bargh, 1999). These media also afford individuals opportunities to overcome obstacles that normally inhibit them in face‐to‐face interactions, such as social anxiety, loneliness, or lack of social skills (e.g., Reid & Reid, 2007; Sheeks & Birchmeier, 2007). It is possible that individuals who experience chronic ostracism in other aspects of their lives could seek out relationships via these media to fortify their threatened needs. A potential downside to this approach is that chronically ostracized individuals may also experience ostracism in these media, thus exacerbating their problems.

Researchers who investigate any of these potential interventions should also take care to consider how their interventions may interact with demographic variables such as age or gender, as well as the individual’s cultural context. The results have been mixed on the degree to which age or gender may moderate the situational effects of ostracism (Williams, 2009, but see Abrams et al., 2011; Pharo et al., 2011 for age; Stroud et al., 2002; Stroud et al., 2000 for gender) but given the scant research on chronic ostracism researchers should take meas- ures of these variables and examine any potential moderation effects. Regarding culture, there have been few attempts to study ostracism cross‐culturally, other than simply to determine that it has negative outcomes regardless of where one lives (e.g., Hartgerink et al., 2015). However, some studies have found that individual differences in self‐construal (i.e., collectivistic vs. individualstic) can moderate the effects of ostracism (Pfundmair et al., 2014; Ren et al., 2013). Different countries and cultures vary on their self‐construal focus, and one program of research has investigated the differential effects of ostracism on various outcome measures across different countries, finding a complex pattern of results – collectivism moderates some outcomes and individualism moderates others (Pfundmair, Aydin et al., 2015). As such, it is clear that ostracism research must take cultural context into consideration in future studies.

### “I Want To Be Alone”: Self‐Ostracism/Being Alone*.*

As Greta Garbo has often been quoted, sometimes people want to be alone. When do individuals choose to ostracize themselves from social situations? Do individuals who choose to be alone and isolate themselves from others still experience feelings of being ignored and excluded, or does the individual’s agency in this situation render ostracism’s negative effects moot? Further, are there situations where too much inclusion can be aver- sive, making *self‐ostracism* an attractive alternative? This is another exciting new area of research on ostracism.

One reason for wanting to be alone is to prevent anticipated ostracism or rejection. Indeed, one defining characteristic of *rejection sensitivity* (Downey & Feldman, 1996) is to avoid social situations because of fear of further rejection. Defensive ostracism (Williams, 1997, 2009) occurs when someone ostracizes others as a preemptive attack on becoming similarly ostracized by others. This motivation for self‐ostracism, of course, puts the individual in a downward spiral of separation and isolation and probably quickens the transition into the resignation stage. This form of avoidance, however, may not always be irrational and counterproductive. Because individuals may choose solitude over social interactions when the anticipated social interactions are predicted to be unpleasant (Fox, 1980), they may be happier and experience less stress than they would in the unpleasant interaction. The line between functional and dysfunctional would seem to involve the extent to which individuals *accurately* assess the likelihood of unpleasantness or whether they *over‐anticipate* rejection and unpleasantness (for example, see Epley & Schroeder, 2014).

But, a more adaptive and healthy reason for seeking solitude is that individuals may choose to be alone because it affords beneficial contemplative or spiritual thoughts and behaviors and may facilitate creative endeavors (Long & Averill, 2003). Indeed, not spending enough time alone – aloneliness – can be linked with diminished well‐being (Coplan et al., 2019). Most of the research on motives for solitude has been conducted with children and adolescents and found that some motives are related to simple disinterest in socializing at that moment and others relate to shyness and fear of negative social interactions (Bowker & Raja, 2011; Coplan & Armer, 2007; Coplan et al., 2004; Galanaki, 2004). Other studies have examined soli- tude‐seeking among emerging adults (see also Nelson & Millet, Chapter 11, and Nguygen et al., Chapter 16). For example, a recent study with college students showed that solitude decreased high‐arousal affect (Nguyen et al., 2018), suggesting emotion regulation might be another reason why many young adults seek solitude.

In a recent study, we also investigated the motives for solitude in college students using a descriptive approach. We asked 176 undergraduates to list as many situations as they could think of for when someone would want to be alone (i.e., no social contact with anyone either in person or over electronic media, such as cell phones or the Internet). They listed 955 different reasons and we created ad hoc categories based upon patterns that emerged in their answers (Table 15.1; full data are available from first author). The most common category of reasons was *negative event‐induced*, followed by *concentration*‐related activities, and *emotions* (predominately neg- ative). These data support the idea that many individuals may desire solitude when an anticipated social inter- action may be unpleasant (Coplan et al., 2004; Fox, 1980), and suggest that the occurrence of an unpleasant social interaction may also increase the desire for solitude. The data also suggest that some individuals may seek solitude to engage in contemplative behaviors (Long & Averill, 2003), but that this reason for solitude was less common that those pertaining to negative social interactions or emotions.

Ostracism certainly is an unpleasant social interaction that taxes one’s cognitive and emotional resources. Several studies, both surveys and experiments, have been conducted to examine the degree to which ostra- cism makes one desire solitude. Across five samples, researchers observed a reliable association between the experience of being ostracized and participants’ desire for solitude. Further, in five experiments that used different manipulations and samples, results consistently demonstrated that manipulating ostracism lead to increases in desires to be alone in subsequent activities (Ren et al., 2016; Ren et al., 2019). These findings suggest that ostracized individuals may desire solitude to cope with the social pain.

These previously mentioned research questions about self‐ostracism may have interesting implications for the study of chronic ostracism. Some individuals may actively choose to self‐ostracize because they fear being negatively evaluated or subjected to other negative experiences (e.g., ostracism) in the future, which could become problematic if they choose to shun social connection entirely. Indeed, data suggest that indiviuals who seek solitude because of these types of fears report negative outcomes similar to those seen in research on chronic ostracism (e.g., depression and substance abuse; Jorgensen & Nelson, 2018; Nelson, 2013). However, there are individuals who actively choose to self‐ostracize for extended periods of time and do not experience the theorized negative outcomes for chronic ostracism. Some individuals seek solitude simply because they have little interest in social interactions, rather than because they fear negative treatment; these unsociable

invidiuals do not appear to experience the harmful psychological outcomes exhibited by other individuals who are lonely and isolated (e.g., Nelson et al., 2016).

Another example group of individuals that choose this option may loosely be called *hermits*. There is a dearth of psychological research on hermits, who are defined typically as people who choose to live in solitude and avoid social interactions (Hodgetts et al., 2010). The scant research that exists suggests that these individu- als actively choose to avoid social connections, sometimes due to previous traumatic social experiences ( Jones, 2006; Paul, 2011). These individuals will often report finding solace in religious practices or parasocial relationships (Conley, 1994; Hodgetts et al., 2010; Paul, 2011). There have been few studies of the psychological implications of these practices, so it is difficult to confirm whether the activities these individuals use to sup- plant traditional social interactions actually satisfy their psychological needs or if this is simply their biased perceptions.

Further, self‐ostracism can be considered within various cultural contexts. For example, at least half of a million Japanese citizens (predominately adolescents and young adults) are classified as *hikikomori* – individuals

who have withdrawn from the social world, often locking themselves in their own houses for months or even years (Furlong, 2008; Kaneko, 2006; Tamaki, 2013). Thus, both the phenomena self‐ostracism and socially withdrawn groups such as hermits and hikikomori offer fruitful directions for examining the potential bound- ary and cultural conditions for the effects of chronic ostracism.

##### Summary

Ostracism – being ignored and excluded – is a painful event that the majority of individuals will experience at least once in their lives. This chapter reviewed the research on various affective, cognitive, and behavioral reac- tions to ostracism and suggested future directions, particularly for studying indidividuals who are ostracized chronically. We also reccomend that ostracism researchers consider the situations and motives in which ostra- cized people choose to withdraw from social circumstances and seek solitude.

# The Possibilities of Aloneness and Solitude: Developing an Understanding Framed Through the Lens of Human Motivation and Needs

### Introdnction

By some accounts up to half of adults’ waking time is spent alone. Yet research on the experience and functions of time spent alone has been relatively neglected, in part because of pervasive the recognition that social con- tact is fundamentally important to humans (Coan & Sbarra, 2015). In this chapter, we examine some of the varied ways people spend time alone, and the implications of time alone for emotion regulation and wellness. In particular, we focus on time people spend in solo activities, as well as time spent in *solitude*, or time when one is alone with oneself.

### Distingnishing Aloneness and Solitnde

Before we can empirically study aloneness and solitude, we need to clarify these overlapping constructs. There are many ways that aloneness and solitude have been defined and operationalized in the social psychological and developmental literatures (e.g., Larson, 1990; Long et al., 1993), with definitions varying in two salient ways: (1) whether the construct of aloneness or solitude includes or excludes situations where an individual is not interac- tive but is in the presence of other persons, whether physically (e.g., surrounded by strangers) or virtually (e.g., passive browsing on social media); and (2) whether “being in solitude” should be distinguished from “doing an activity alone.” We discuss both issues and their implications for how aloneness and solitude can be understood.

*Solitude vs. not interacting*. To guide discussions of the topic, Larson (1990) offered a detailed definition of “solitude,” arguing that it should strictly refer to the absence of all of aspects of being with others; that is, the absence of immediate social demands, constraints, and scrutiny, as well as the absence of the opportunity for relating, social engagement, and mutual enjoyment. This definition of solitude entails not only physical separation from people, but also further the severing of exchanges of information and affect. In Larson’s view, if an individual is sitting silently in the presence of another, he or she is not considered to be in solitude because there is an expectation of some sort of shared experiences or affect with the other person. Using this criterion, a person would not be alone in a solitary state when conversing with someone by phone because there is an exchange of relational information. Yet, if watching TV or listening to music

when alone, the person would be in a solitary state because the TV or radio do not observe or respond to the individual, impose demands, interact, or provide feedback (p. 157; Larson, 1990). Building on this definition, Larson and colleagues (1990; 1997) measured solitude by asking participants what other people were present at the time they were signaled to complete a survey, using the following options: alone, with friends or acquaintances, with family, with strangers, or other. When selecting “alone,” participants were considered to be in solitude.

Long et al. (2003) offered a somewhat different definition of solitude, as “a state of being alone – either by oneself or, if in the presence of others, without any social interaction” (p. 579). Thus, for Long and colleagues, solitude could include situations where others are physically present, so long as direct social interaction is absent (Long et al., 2003). This definition has been adopted in recent studies (Lay et al., 2018, 2019) measuring outcomes of solitude.

This definition of solitude depends on the assumption that, when alone but “in public,” that “stranger‐ other” cues are not operating on individuals shaping their experience (e.g., social facilitation effect; Markus, 1978; Bond & Titus, 1983; Hetherington et al., 2006). In this regard, Long and colleagues (2003) have suggested that to the extent individuals are psychologically disengaged from immediate social contacts, they would feel free to do what they elect rather than being shaped or inhibited by social demands.

Nonetheless, the current empirical body of work does not allow us to confidently conclude that the solitude that occurs when physically alone (private solitude) and the solitude that occurs when in the presence of others (public solitude) are not felt as two qualitatively different states. Public and private solitude may have aspects that are distinct. For example, Franzoi and Brewer (1984) reported that people are more likely to experience themselves as “social object that other people look at or react to” when around other people compared to when physically alone. Insofar as the presence of noninteractive others (such as in restaurants or on trains) may bring such social dynamics into experience, this form of being alone should be differentiated from solitude. Indeed, it is difficult to know when individuals allow the presence of others to influence their own thoughts and behav- iors (Carver & Scheier, 1978; Goffman, 1959, 1971; Larson, 1990). Thus, for our purposes, we distinguish “being alone but around others” from solitude per se.

*Solitude vs. doing something alone*. Consider how people spend time alone in their daily lives. They work. They study. They watch television. They read a book or browse the internet. They prepare a meal. Once in a while, they might also sit quietly with their thoughts and feelings. Thus, in many situations in which people consider themselves to be “alone,” their experience is influenced, if not dominated, by a focus on an activity in which they are engaged.

Several studies have examined people’s experiences with activities while alone. For example, when alone, people have been shown to interact with smart devices as a way to reduce boredom and stress (Leung, 2015; Wang et al., 2012). When there is no one around or nothing to do, people are prone to using media as a way to kill time, especially if lonely (Perse & Rubin, 1990). Indeed, some have argued that passive media use (e.g., watching television) when one is alone might reflect tendencies to seek social belonging through connecting with characters on TV shows or movies (Greenwood & Long, 2009). In this way, being alone while engaged in media activities may still reflect a “social” experience.

Across cultures, people prefer to be doing something when alone rather than doing nothing (Buttrick et al., 2018) and the activities that one performs when alone may have different functions that qualify how they are experienced. For example, when an activity serves a utilitarian goal, like shopping for groceries, people express more interest in doing it alone, whereas when an activity is hedonically focused (like eating at a restaurant or going to a movie theater) people more often prefer the company of others (Ratner & Hamilton, 2015). That is, when doing something fun or enjoyable, people’s experiences are enhanced by the presence of others. Therefore, to the extent that experiences of being alone will differ as a function of the activities performed, being alone while doing an activity should be distinguished from being alone without a specific activity – that is, from being in solitude – a distinction we will discuss further in a later section of this chapter.

*Solitude vs. aloneness.* We argue that being alone, and without either social presence or an immediate focus on specific external activities, can best be thought of as a new category of experience, namely, *solitude*. Solitude is a state in which an individual spends time alone *with themselves* rather than with a *deliberate focus on an externally focused activity* or with the (potentially influential) presence of other persons. This definition, therefore, distinguishes solitude as a specific type of aloneness, one having the features of being both physically alone and free of specific activities.

This raises the question of whether deliberate thinking is considered an activity or whether it should be excluded from the definition of solitude. We argue that the opportunity for thinking is a feature of solitude, and thus cannot be taken out. In a later section, we describe evidence suggesting that the ability to turn internally and become more aware of one’s inner experiences is a unique quality of being in solitude, as much of previous literature has suggested (Long et al., 2003; Storr, 1988). For example, people generally report more self‐reflection and more awareness of inner thoughts and emotions when alone compared to when interacting with others (Nguyen et al., *in preparation*). Evidence also shows that people report engag- ing in more self‐reflection and inner‐focused experiences when they sit alone with no external activities compared to when they read or browse on their phones (Nguyen et al., *in preparation*).

Further, in the literature, the word solitude is often used to describe a state in which the self is the central focus of one’s alone experience. For example, Anthony Storr (1988) named his book about solitude as *Solitude: A Return to the Self*. Likewise, Michael Harris (2017) wrote a book on solitude to encourage people to find more time alone and regain their sense of self. Robert Kull (2010), a writer who has spent much of his time in the wilderness, spoke of solitude as a wisdom‐seeking experience. Indeed, many authors have depicted solitude as a struggle, a pursuit, or a journey toward finding oneself. This emphasis on the use of solitude as a time of reflection and personal growth suggests that for many people solitude entails a particular type of aloneness in which the person is occupied with inner experiences.

In sum, being alone in the presence of others and being alone but engaged in an externally focused activity both represent conditions in which the experience of aloneness is influenced by other factors. Both stand in con- trast to another form of aloneness in which a person is both physically alone (not in the presence of others) and not doing a specific externally focused activity: a state for which we reserve the term *solitude*. By distinguishing solitude from both doing an activity while alone and from being alone in the presence of others, we can then take a bottom‐up approach, studying solitude as well as by adding in varied levels of social presence and types of activities to understand how such additional factors change the way people experience being alone.

### Effects of Aloneness and Solitnde

In an initial series of studies using this bottom‐up approach, Nguyen et al. (2018) introduced a solitude condi- tion, built on the definition that solitude is being alone *with oneself*; that is, not with an activity or in the pres- ence of other people. In this solitude condition, participants were invited to the lab to sit alone in a quiet room with no activity for 15 minutes. Nguyen et al. then compared this solitude experience with conditions in which either a social (Study 1) or a solitary activity was added (Study 2). A set of findings that emerged from this strategy concerning the arousal reduction or *deactivation effect* of being alone.

*Aloneness and the “deactivation effect.”* Many people see time alone as an opportunity to disengage from arousing activities and to center oneself. However, what this means from an empirical standpoint is not always clear. In a series of studies we have sought to examine how time spent alone may offer a unique opportunity for affective regulation, and in such a way that both positive and negative affective arousal (excitement, anger) is lowered, allowing for more low‐arousal affects such as calm, relaxation, and sadness. Specifically, we have examined evidence for a deactivation effect that occurs in both aloneness and solitude.

In an initial study, Nguyen, Ryan, and Deci (2018) assigned participants to either the solitude condition described above or one in which they engaged in a conversation with a research assistant. Participants completed

surveys assessing their emotions before and after they spent 15 minutes either in solitude or interacting with the other person. Of interest were 20 items taken from the *Positive Affect and Negative Affect Schedule* – a measure of positive and negative emotions commonly used in social psychology research (Watson, Clark, & Carey, 1988). This measure includes emotional descriptions that pertain to aroused states such as excitement, enthu- siasm, or anxiety, and nervousness. Using this measure to assess changes in affective states, an interesting insight emerged: both positive and negative emotions that were high on arousal dropped in the solitude condition, but not in the social interaction condition.

This finding was important because it clarified previous results by Larson and colleagues (1982; 1990; 1997), suggesting that people experienced lower positive emotions but higher negative emotions when spending time alone. However, Larson’s studies measured positive and negative emotions on semantic dif- ferential scales, which consisted of pairs of emotional items, one positive and the other negative. Some of those scales included items describing high‐arousal states on one end and low‐arousal states on the other, making it difficult to understand whether the differences between alone time and social time lay in the emo- tional valence that people experienced or the arousal levels that were associated with those emotions. Because Nguyen et al. (2018) used only high‐arousal emotion items they found that it was not the case that high‐arousal positive emotions were lower and high‐arousal negative emotions higher in the solitude condi- tion compared to the social interaction condition. Instead, both types of emotions reduced significantly after solitude.

In a second study in this series, Nguyen et al. (2018) then compared solitude with a condition in which people spent time alone on a quiet, sedentary activity, namely *reading*. This time the researchers used a revised version of the PANAS that included all four types of emotion: high‐arousal positive emotions, high‐ arousal negative emotions, low‐arousal positive emotions, and low‐arousal negative emotions. Results showed that when spending time either in solitude or spending time alone with a reading task, both types of high‐arousal affects diminished. Together these studies thus suggested what we refer to as a deactivation effect of being alone, which appears to occur both for solitude, and for spending time alone on a sedentary activity.

To further test for this, Nguyen et al. (2018, Study 4) examined the deactivation effect at both the day level and the week level using a switching‐replications experimental design. In this study, 157 undergraduate par- ticipants took part for 14 days. Half were instructed to spend time in solitude (i.e., doing nothing) for 15 minutes each day only in the first week but not in the second week. The order of the solitude versus non‐soli- tude week was reversed for the other half of the participants. All participants reported their affective experi- ences at the end of all 14 days. Findings showed that high‐arousal affects, both positive and negative, dropped significantly during the week in which participants were instructed to carry out a 15‐minute‐per‐day solitude experience, for both groups (see Figures 16.1 & 16.2). Interestingly, for participants who engaged in solitude

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on the first week, their high‐arousal affect remained low into the second week, suggesting some carryover effects from the time they had spent in solitude.

The deactivation effect refers to the drop of high‐arousal positive and negative affect. However, the one time that we did not observe the full deactivation effect was a condition in which participants were instructed to deliberately focus on thinking when spending time alone (Study 3; Nguyen et al., 2018). In this experiment there were five conditions involving being alone or in solitude: (1) a solitude condition (i.e., with no instruction to do or think anything); (2) a forced‐choice positive thought condition (i.e., when par- ticipant was instructed to think positive thoughts); (3) a free‐choice positive thought condition (i.e., when participant was offered the choice between positive and neutral thoughts and chose to think positive thoughts); (4) a forced‐choice neutral thought condition (i.e., when participant was instructed to think neutral thoughts); and (5) a free‐choice neutral thought (i.e., when participant was offered the choice between positive and neutral thoughts and chose to think neutral thoughts). In all conditions drops in high‐ arousal negative affect were evident, except those who were forced to think about neutral thoughts. Yet for high‐arousal positive affect, only those in the solitude condition and those in the forced‐choice neutral thought condition experienced significant drops, whereas those in either free‐choice or positive thought conditions did not.

These findings suggested that both choice and positive thinking helped maintain participants’ activated positive affects when spending time alone. Thus, they provided preliminary insights into the ways people can keep themselves energized and engaged when spending time alone. These initial findings of a deactivation effect warrant further research. In future research, testing the effects of stimuli on the time people spend alone, we will need to think systematically about our predictions around which types of stimuli might mean- ingfully change the way being alone affects level and type of arousal. For examples, in contrast to sedentary activity done alone (reading), we can examine active behaviors like engaging in exercise alone, to isolate both physical and mental inputs to emotional arousal. We can also contrast passive (e.g., reading, TV) versus active (e.g., video games) entertainments for differing effects. For example, Ryan, Rigby and Przybylski (2006) found that solo playing of video games fostered increased vitality, a form of activated positive affect. Through understanding how different types of stimuli alter experiences during time spent alone, we can begin to explore how varied activities might reflect the ways in which people constructively regulate their time alone, or to the contrary, experience aloneness as a time of loneliness or boredom. For example, Congard et al. (2019) recently found that people undergoing a mindfulness meditation intervention, which entailed doing a 20‐minute mindfulness activity alone daily, showed a trajectory of decreasing high arousal affect, both negative and positive, over time.

*Self‐focused experience as a unique quality of solitude.* When defined as being alone without an occupying activity or the presence of other people, solitude provides context that uniquely opens a space for self‐focused experiences (Franzoi & Brewer, 1984). When surrounded by others, our thoughts and behaviors are more frequently shaped by social norms or standards (Alexander & Knight, 1971; Franzoi & Brewer, 1984; Long & Averill, 2003). The presence of others can also induce public self‐consciousness, which involves experiencing oneself as a “social object” (Plant & Ryan, 1985).

In contrast to public self‐consciousness, private self‐consciousness pertains to the experience of being aware of one’s own thoughts and feelings. It has been proposed that private self‐awareness might be higher when people are alone compared to when they are with others (Franzoi & Brewer, 1984). Yet evidence so far has been inconsistent. Franzoi and Brewer’s (1984) reported greater private self‐awareness when participants were alone than when with others in one study but did not replicate this result in a second study. In these studies, the authors also did not account for whether participants were engaging in any activities when they were alone.

In two recent experiments, Nguyen et al. (*in preparation)* compared a solitude condition with two other conditions, one with other‐presence cues and one with an activity. The first experiment used a repeated‐ measures design by exposing participants to both the solitude condition and other‐presence condition (the order of conditions was randomized). In the other‐presence condition, participants were instructed to browse on their Facebook feeds; however, to distinguish this from a social interaction condition (as in Study 1; Nguyen et al., 2018), Nguyen and colleagues asked participants not to engage in any back‐and‐forth interactions with others. In this first study, participants reported engaging in more self‐reflection in the solitude condition compared to the other‐presence condition. Consistent with previous research (Alexander & Knight, 1971; Franzoi & Brewer, 1984; Long & Averill, 2003), simply browsing on Facebook feeds increased experiences of public self‐consciousness – concerns about what other people might be thinking about oneself.

In a second study, Nguyen and colleagues (in preparation) used a between‐subject design in which partici- pants were randomized to three conditions: a solitude condition, an alone with reading condition, and an alone with social media condition. For the alone with reading condition, participants were allowed to choose their own readings materials to spend time with for 15 minutes. Likewise, for the alone with social media condition, participants this time were allowed to browse on any social media apps of their choice. We found that participants were most likely to report spending time in self‐reflection when in solitude, more so than when they were alone with a reading. Those who were instructed to browse on social media, despite not physically or directly interacting with anyone, reported the lowest level of engagement with self‐reflection, less than those who were reading alone or those in solitude. These experiments demonstrate that the one is engaged in activity when alone, the less time they spend in self‐reflection, whereas the latter may be more potentiated by true solitude.

These findings on the influence of activity and salience of other‐presence during time spent alone could be interpreted in a number of ways. First, it can be explained with a distractibility hypothesis: peo- ple might interact with activities or with social media as a strategy to distract themselves from negative emotions. In other words, some people might prefer going on social media or doing an activity because they do not want to face their internal experiences. A second view is simply that people’s capacity to self‐ focus is disrupted by an outward focus on activities and other people; in this case, attention is drawn away from what is happening internally. These two hypotheses suggest different mediating factors that explain why doing activities when alone disrupts self‐reflection, whereas being in solitude may conduce to private self‐consciousness.

Anecdotally, much of our daily time alone is filled in with activities that detract from, or crowd out, the opportunity to spend time with ourselves in solitude. Yet, to find the time to be aware of one’s internal thoughts and feelings requires finding the time for solitude. Although these internal processes are definitely not specifi- cally reserved for solitude, it appears that solitude offers a unique space that allows people to analyze their thoughts and feelings, and reflect on values and aspirations. Note that the literature on private self‐awareness distinguishes fruitful self‐reflection that leads to growth, new insights, and creativity, from destructive rumina- tion that perpetuates worries, doubts, and self‐criticisms (Grant et al., 2002; Roth et al., 2015; Trapnell &

Campbell, 1999). Therefore, it is important for future research to identify conditions in which solitude fosters productive self‐reflection and insight development and when it is filled with negative thoughts or rumination.

### The Role of Antonomy in Aloneness and Solitnde

Although doing activities when alone may detract from self‐awareness, they can also contribute positively to our experience of aloneness. Undoubtedly, this is partly why people pursue activities that occupy them when they are alone. However, people may not always experience themselves as having choice, spending their time alone completing tasks that they think they should be doing or have to, to fulfill some obligations and expectations. Thus, when people are alone but doing an activity, the quality of motivation for the activity will be important in determining the outcomes of the alone experience. However, when considering the category of solitude, time spent alone not doing an activity, experience will be influenced by the autonomy for being in solitude. Therefore, we see that it is important to distinguish between autonomy for doing an activity while alone from autonomy for being in solitude; one focuses more on the motivation for the activity and the other focuses more on the motivation for experiencing time with oneself. Some people might willingly spend time doing an activity alone like going shopping, eating dinner, doing homework, or playing video games, but might not like to spend time with themselves without any activity. Research has looked at the role of motivation for spending time alone in moderating different changes in emotions from before to after experiencing solitude (Study 3; Nguyen et al., 2018) as well as the link between motivation for spending time alone with psychological well‐being outcomes (Nguyen et al., 2019; Thomas & Azmitia, 2018). We consider both topics, in turn.

##### Motivation When Doing Things Alone

According to self‐determination theory (SDT; Ryan & Deci, 2017), experiences with different activities or behaviors vary depending on how autonomous the motivation is for engaging in them (e.g., Ketonen et al., 2018; Langan et al., 2016). *Autonomous motivation* refers to a willingness to act, as when a person personally values an activity or finds interest in it. Alternatively, a person might do an activity out of external pressure, or to avoid guilt or shame. These two forms of motivation – the former is called external motivation and the latter intro- jected motivation – are together referred to as *controlled motivation* within SDT. Whereas controlled motivation is often associated with more negative experiences such as depletion and negative affect, autonomous motiva- tion is typically accompanied with more enjoyment and feelings of satisfaction (Deci & Ryan, 2000; Ryan & Deci, 2017).

Applying the concepts of autonomous and controlled motivations to doing certain activities when alone, one can readily can see examples where one might feel compelled and coerced into engaging in certain behav- iors alone (e.g., working on a dreaded assignment to meet a deadline) as well as situations in which doing something alone is wholly volitional (e.g., taking a walk; doing a puzzle). A hypothesis consistent with SDT would suggest that, to the extent that the value of performing certain activity alone is autonomous, individuals will experience their time alone more positively. Next, we will explore cases when people don’t experience autonomy when alone and propose underlying explanations.

*Problems with lack of autonomy when alone or in solitude.* It is interesting to ponder cases where a person is alone but experiences little autonomy. When we are alone, other people are not around to tell us what to do or force us to do things that we do not want. Yet, other people can influence us in more complex ways than simply through direct interaction. In his chapter *The Capacity to Be Alone*, Winnicott (1958) discussed the idea that our internalized images of a caregiver manifest in the ways in which we experience and spend time alone. Internalization refers to the process of turning an experience or object of the external environment into an internal experience. For example, a child can internalize the image of a caring and loving mother, and when the mother is not immediately available, the child can “summon” that internalized

image of the mother to self‐soothe. The child can also transfer the mother’s internalized image onto a transitional object, such as a stuffed animal or an imaginary friend, and rely on that object for comfort. Winnicott suggested that it’s the process of internalizing the way we have been cared for that gives us the capacity to tend to ourselves as we grow older when we are alone.

Introjects are the “should” and “have‐to” messages people carry with them; the expectations from others that have accumulated as a result of influential experiences where others have motivated through pressure behaviors that are not intrinsically valued or meaningful (Ryan & Deci, 2017). Introjects are likely to be the driver of the activities and experiences we have when no one is around, as solitude allows for internal processes to come to the forefront (Thomsen et al., 2011; Vandenkerckhove et al., 2019). As such, we argue that the self‐ doubt and ruminative thoughts that people experience when spending time alone can sometimes be a function of their introjects. Introjects make individuals feel that they are compelled to engage in activities out of guilt or anxiety, such as feeling the pressure to catch up on work when alone, even though one might prefer to relax and read a book. Alternatively, introjects can manifest in forms of unrealistic expectations that people have for themselves, leading to regrets and self‐doubts when feeling that they fell short of meeting those expectations. Introjects are the core of inauthentic aloneness.

Thus, the possibility of introjects in solitude pose a problem for a definition of solitude as “free from social pressures. . .” since we may carry such expectations and pressures with us even when alone through the process of internalization (Assor et al., 2004; Sandler & Rosenblatt, 1962). This can be addressed by emphasizing such pressures are *external* pressures, expectations, and influences directly imposed by others. On the other hand, we can better understand the outcomes of solitude in terms of whether introjected or identified motivations are carried into the state of being alone.

On the opposite side of feeling like one has to do something when alone, some people might not know what to do when they are alone, including cases where people do not engage in activities that are meaningful to them. Such experiences also reflect a lack of autonomy. If individuals have little opportunity to exercise their autonomy in their everyday experiences, they are likely to do things only in the presence of extrinsic motiva- tors, such as rewards or pressures from other people. As such, in the absence of extrinsic motivators when alone, the person is likely to see little value in engaging meaningful activities. Instead of introjects, what the person experiences in this state is amotivation – the lack of motivation (Gagne & Deci, 2005; Garn et al., 2010; Ntoumanis et al., 2004; Standage et al., 2003). An example would be someone who mindlessly surfs the inter- net without engaging with it in any meaningful ways. When people lack the motivation to do anything when alone, they resort to activities that are of little value and less challenging simply to fill the time. They feel bored and inactive yet exert little energy to change their situation. Thus, we see that amotivation can also character- ize some experiences of spending time alone.

##### Autonomously Spending Time Alone

Recently, Coplan et al. (2019) laid out how time alone – its costs and benefits – transform from childhood to adulthood. They postulated that the value of time alone rises particularly during adolescence when it is useful for emotional restoration, pursuit of autonomous activities, and teenagers’ development of interests and iden- tities. Subsequently, as individuals begin to gain more control over how time alone is spent, it has become clear that, for adolescents, adults, or elderlies, choice plays a significant role in how solitary time may be spent and experienced (Lay et al., 2019, 2018).

It is important, however, to distinguish between choosing to be alone over being with others and autono- mously pursuing time alone for its enjoyment and benefits. In Lay et al.’s research, they operationalized choice as “wanting to be alone” or “wanting others nearby but no interaction.” This operationalization of choice aligns with the concept of preference for aloneness (Burger, 1995; Wang et al., 2013; Cramer & Lake, 1998) over otherness in the social approach and social avoidance model (Asendorpf, 1990; Gazelle & Rudolph, 2004). This is conceptually distinct from the concept of autonomy in self‐determination theory. Although preference for

being alone reflects intentionality to be alone, it does not specify that the person approaches time alone as something valued for its own experiential quality, as opposed to it being a way to be away from interactions with others. On the other hand, from the SDT framework, the concept of autonomy for spending time alone specifies a motivational quality that is characterized by volition, value, and interest. As such, although prefer- ence for spending time alone has been linked to psychological maladjustment in early or late adolescence (Wang et al., 2013), those with high autonomy for aloneness who approach time alone for its enjoyment and experiential benefits experience greater well‐being outcomes (Chua & Koestner, 2008), and gain more emo- tional benefits from spending time alone (Nguyen et al., 2018). These findings suggested that embracing the value of time alone, rather than simply choosing, may be an important factor in determining how much we can benefit from it. Particularly, it has been shown that those who see time spent alone as a valuable and enjoy- able experience, when they have some time to be in solitude with themselves (doing nothing), they became more relaxed and less stressed and gained greater satisfaction from the experience (Study 4; Nguyen et al., 2018).

These findings are also congruent with those of Thomas and Azmitia (2018), who applied a Motivation for

Solitude Scale based on SDT developed by Nicol (2006). They found that people who reported engaging in soli- tude, simply defined as spending time alone, for non‐self‐determined reasons such as discomfort around others also reported greater loneliness, social anxiety, and depressive symptoms. In contrast, alone time chosen for more autonomous reasons, such as “getting in touch” with oneself, was not associated with negative indicators, and showed associations with reports of growth and self‐acceptance.

As such, the next important question is how do we get people to find more value in having time for solitude? In two studies (Nguyen et al., *under review*; Nguyen et al., 2019) demonstrated that supporting autonomy for engaging with solitude increases autonomous motivation for solitude, enhancing its enjoyment, and motivat- ing people to engage with solitude longer instead of seeking out boring distraction. Autonomy for solitude was defined as a motivational experience whereby an individual approaches solitude for intrinsic and self‐deter- mined reasons instead of feeling forced or pressured into it.

Nguyen et al. (*under review*) experimentally created three conditions: a neutral solitude condition (as in Nguyen et al., 2018), an autonomy‐supportive solitude condition, and an autonomy‐thwarting solitude condi- tion. In all three conditions participants received the instruction to sit alone without engaging in any communi- cation via devices or activities. However, the instruction was delivered in varied tones based on self‐determination theory framework to evoke different motivational experiences in the subjects. Of our interest was the difference between the instruction that supports the participants’ autonomy compared to the instruction that thwarts it; that is, the autonomy‐supported solitude and autonomy‐thwarted solitude conditions.

Participants received an autonomy‐supportive instruction, which was created with three specific qualities in mind: (1) the instruction acknowledges that each subject can have very different experiences, so there is no right or wrong way to feel; (2) the instruction allows each subject to see how solitude feels to them without imposing any specific values of solitude on the subject; and (3) the instruction does not use controlling language such as “must,” “have to,” or “should.” In contrast, in the condition in which participants received an autonomy‐ thwarting instruction, the experimenter used controlling language to communicate that they “must” spend the time alone in the fashion as it was described. Although the first condition allowed research subjects the auton- omy to engage with solitude as a personal experience, the second condition made the subjects feel restrained by certain expectations and have little choice in the experience. These two examples carry different motiva- tional tones, and thus are likely to result in different experiential outcomes.

These researchers found that those who received autonomy‐supportive instruction subsequently reported valuing the solitude experience more than those who received the autonomy‐thwarting instruction. Those who received pressuring instructions to spend time alone experienced heightened levels of low‐arousal nega- tive emotions like sadness and loneliness, whereas those who received supportive instruction did not have this experience. This was the first experimental evidence to show when people have autonomy in solitude, they engage it more positively.

Indeed, participants who were given supportive instruction also chose to continue to stay in solitude for longer, even when they had the option to do something else. This was observed in the later part of the

experiments, when we left participants in the room alone, giving them the option to engage with a boring activity while waiting. The reason for giving participants a boring alternative was to test whether participants would rather do anything, even a boring task, than sitting alone with their thoughts. Some researchers have suggested that this experience is uncomfortable (Buttrick et al., 2018; Westgate & Wilson, 2017; Wilson et al., 2014;), and that, should one find oneself alone briefly at any given time during the day, he or she would rather find something to do to fill the time. However, in both of our studies, 24% in Study 1 and 23% in Study 2 out of the participants who received supportive instruction chose to continue sitting completely in solitude when given the choice to engage in an external activity, compared to 13% in Study 1 and 15% in Study 2 out of those who received pressuring instructions. These results demonstrated that, even though sitting in solitude with nothing might be something that many people would rather avoid, people benefit more from solitude and engage with it more when they see solitude as valuable and important to them.

### Personality and Being Alone

Some people may have a higher capacity for being alone more than others. For example, as suggested by Winnicott (1958), perhaps people with insecure attachments find being alone a more negative experience because of their neediness for others. Or perhaps extroverts find it harder to be alone? Finally, perhaps people with more tendencies toward autonomy can better navigate the open space of solitude?

Several studies have examined personality correlates of attitudes toward spending time alone. Yet before we delve into a discussion around personality underpinnings in the context of solitude, it is important to consider the limitations of relying on self‐reported measures of personality constructs. First, we need to consider the validity of the personality measures in question, including which samples have been used in its development and testing, and its reliability across multiple independent studies. Second, we need to ensure construct validity by evaluating the relations between a targeted personality measure and its correlates over several replications instead of relying on findings from a single study. Third, as often there are several measures of the same per- sonality construct based on different conceptualisations, it is important to be transparent about which measure of a certain construct has been used (Flake & Fried, 2019). In relation to attitudes toward time alone, we sug- gest that solitude researchers be clear about what measures of time spent alone are used and how they are operationalized, so that we can gain a more accurate understanding of the association between personality and variables and people’s experiences when spending by themselves. We will apply these considerations to our reports, below, of studies examining personality correlates of attitudes toward time alone.

In a seminal study in this area, Long et al. (2003) asked undergraduate participants to report how fre- quently they experienced each of the three categories of solitary experiences: inner‐directed solitude, outer‐ directed solitude, and lonely solitude. Inner‐directed solitude pertained to time spent alone for self‐discovery, to seek peace and freedom from social controls, to pursue creative activities, or to complete tasks that involve problem solving. Outer‐directed solitude referred to time alone devoted to reflecting on one’s social rela- tionships with those who are not immediately present, to connecting with one’s spiritual deity. Finally, lonely solitude was understood to be time alone that is lonely or spent on escapism such as engaging in activities that serve to distract from the experience of being alone. Examining the correlations between those three categories of solitary experiences and measures of personality, Long et al. found that inner‐directed solitude was positively related with Averill’s (1999) measure of emotional creativity. Outer‐directed solitude corre- lated positively with emotional creativity and negatively with Brennan, Clark, and Shaver’s (1998) measure of avoidant attachment. Finally, lonely solitude yielded significant correlations with the most personality scales, including negative associations with Eysenck and Eysenck’s (1964) measure of extraversion and posi- tive correlations with neuroticism, as well as with both avoidant and anxious attachment styles (Brennan et al., 1998). Long et al. (2003) results also suggested that aside from lonely solitude, *frequency* of engaging in other types of solitary experience is associated with positive personality characteristics, and particularly with emotional creativity.

In a separate study, Leary et al. (2003) provided participants with a list of 12 common activities (e.g., eating in a restaurant, going to a movie). They were then asked to indicate how frequently (in the past month) they engaged in each of these activities and how frequently they did those activities by themselves. Participants were also asked the likelihood they would do each activity if they could not find others to do it with, and how much they would enjoy doing each activity alone. The researchers found that frequency of engaging in solitary activi- ties alone correlated negatively with extraversion (using the NEO‐PI by Costa & McCrae, 1992). The rated likelihood of engaging in solitary activities was negatively correlated with sociability (using Sociability Scale by Cheek & Buss, 1981). Enjoyment of solitary activities showed similar correlations with the same variables as the likelihood of engaging in those activities. Finally, and interestingly, sociability – how much one enjoys company of other – positively predicted how much the participants rated they would enjoy engaging in activities alone.

The two above‐mentioned studies presented a nuanced picture of the link between personality and individu- als’ experiences with time alone. Yet, despite popular notion that enjoyment with time spent alone is character- istic of introverts, extraversion measures (Costa & McCrae, 1992; Eysenck & Eysenck, 1964) showed negative correlation with frequency of engaging in solitary activities rather than enjoyment with time spent alone. This absence of the link between introversion‐extraversion dimension of big‐five personality was further demon- strated in a set of four daily‐diary studies by Nguyen et al. (*under review*). They investigated how trait measures of attachment (using Adult Attachment Scale by Collins & Read, 1990), introversion (using Big Five Inventory by John & Srivastava, 1999), and dispositional autonomy (using Autonomous Functioning Index by Weinstein et al., 2012) predicted both autonomy for, and enjoyment of, being alone or in solitude. Among their findings was that those with avoidant attachment displayed a preference for being alone but reported negative experi- ences during it. In contrast, individuals who are high on dispositional autonomy derived more enjoyment and need satisfaction from solitude, and were less likely to be bothered by intrusive negative thoughts when spend- ing time with themselves. The findings for introversion and anxious attachment were weak, suggesting these were not strong predictors of reactions to be alone. These findings somewhat contrast with previous findings (Burger, 1995; Goossens et al., 1998; Kwapil et al., 2014; Leary et al., 2003; Long et al., 2003), showing that preference for being alone is characteristic of introverts or those high in insecure attachment. However, none of the previous studies used daily diary designs to track people’s fluctuation in preference for aloneness and autonomy for aloneness, or to track daily affective reactions to such moments. It is also worth noting that an experience sampling by Leikas and Ilmarinen (2016) showed extraverted individuals also experiencing delayed fatigue from too many social interactions. This suggests that extraverts might also benefit from taking some time alone for peace and quiet, which is consistent with findings from a study conducted through BBC Four showing that extraverts rate time alone as more restful than being with others (The Rest Test, 2016).

We are only now starting to identify personality patterns that predict how time spent alone, or in solitude, is experienced. As might seem intuitive, we have observed trends for more introverted individuals to prefer time alone, but it is still unclear whether they directly benefit from this time, and some evidence points away from this conclusion. More consistent findings have been observed for the beneficial outcomes of personality char- acteristics that lead individuals to greater self‐reflection and comfort with the self, as well as with inner‐directed experiences such as emotions, such as dispositional tendencies toward autonomy, and more enjoyment of time spent alone. However, we caution interpretations suggesting that this means personality traits such as prone- ness to autonomy or enjoyment are specific to having more positive experiences in solitude, as it is possible that such individuals are more likely to flourish in any life experiences, whether alone or with others.

### Anthenticity in Solitnde

Authenticity – the experience of being the “real me” (Wood et al., 2008) is an important consideration for understanding time spent alone, because this time presents opportunities for self‐focused attention free from immediate social pressures. When people feel authentic, they are likely to find it easier to express

themselves and stay true to who they are. This is in line with a view of authenticity as one behaving in ways that are self‐authored rather than forced and behaving in ways consistent with one’s emotions and personal values at a particular moment (Ryan & Ryan, 2019). In contrast, when autonomy is thwarted, individuals would prefer to close themselves off to protect themselves from potential threats to self‐esteem (Legate et al., 2012). To the extent that a person feels autonomous when spending time alone, we argue that he or she will be more likely to be receptive and interested in feelings or thoughts that emerge during time spent alone, fostering a sense of authenticity.

In two studies, Nguyen et al. (*in preparation)* investigated what it looks like when people feel authentic or inauthentic when spending time alone, compared to when they feel authentic or inauthentic when spending time with others. One was an online study with participants recruited via Prolific platform and the second was a diary study in which undergraduate participants’ daily responses were collected over five days. In both studies, participants were asked to think of four different experiences in their life: (1) when they were interact- ing with others and were feeling authentic; (2) when they were interacting with others and were feeling inau- thentic; (3) when they were alone and were feeling authentic; and (4) when they were alone and were feeling inauthentic. It was found that although people experience authenticity as frequently as inauthenticity when interacting with others, they experienced authenticity more often than inauthenticity when alone. In fact, people reported experiencing authentic aloneness more frequently than authentic social interactions.

In interpersonal contexts, authenticity and inauthenticity manifest in feelings and behaviors when interact- ing with another person. In time alone, authenticity and inauthenticity manifest in the experiences and activi- ties that are available when no other people are around to influence what we do. If solitude is a space for self‐focused experiences, it may allow individuals to get in touch with feelings and thoughts and to be more able to act in congruence with what is meaningful and valuable to them. In that sense, an activity can be a meaningful addi- tion to solitude when the activity is a manifestation of what we value and find satisfying. On the other hand, an activity infringes upon solitude when it goes against what is personally valued.

Coding open‐ended responses by participants describing their time alone, Nguyen and colleagues found that when asked to elaborate on why certain experiences of aloneness were authentic to them, participants often described situations when they engaged in an activity that they were good at, were intrinsically motivated to do, or that they valued, such as engaging in a hobby or working on project that they were passionate about. Participants also felt authentic when alone when they had the opportunity to do what was important to them rather than what other people wanted them to do, such as going shopping and trying on clothes that they felt comfortable in instead of worrying about what their spouse or friends would think. Furthermore, authentic aloneness is also a time when people gained the opportunity to tend to their own needs, such as the case of a mother’s taking a break from childcare and having some time to herself. In contrast, when asked about inau- thentic aloneness, participants described situations when they had to do something that was of little value to them, such as having to finish a boring assignment, or when they felt unproductive and failed to progress on an activity. Further, rumination is a big theme in authentic aloneness. Many participants reported feeling inau- thentic when they spent time alone dwelling on a failure in the past or experiencing self‐doubt.

From the examples above, we see that satisfaction of autonomy and competence needs are important ingre- dients of positive aloneness. The need for autonomy is satisfied when we experience meaningful choice in behaving and engaging in activities that are congruent with our values and beliefs. Competence need is satis- fied when we feel effective and optimally challenged in what we do (Ryan & Deci, 2017). The freedom afforded from being alone allows people the opportunity to have these two needs met. These two needs are not satisfied when people spend time alone doing things that they feel compelled to do or are doing something to escape from negative thoughts. That is, when activity begins to infringe upon our autonomy in solitude, this can lead us to feel more disconnected from who we are. Thus, it seems that the *quality* of time alone has much to do with the motivation for what one is doing. Time spent on activities of interest and value can yield positive effects on wellness. But time alone can be taken up by tasks one feels controlled to do. Similarly, solitude can be autonomously undertaken and enjoyed, or it can be characterized by internal intrusions such as introjects, ruminations, and insecurities.

##### Conclusion

In advancing the study of aloneness, we have distinguished between being alone among others, being alone but doing an activity, and being alone without an activity, referring to the latter as solitude. In this research program we first examined how being alone influences affective regulation and mood, finding that sitting alone, whether doing an activity or not, tends to be deactivating – it reduces high arousal positive and negative affect. This helps highlight one function of aloneness, namely to reduce arousal, calming both activated positive and negative emotions. These findings suggest that aloneness is a way of being “offline” and may have important implications for emotional regulation.

Second, we looked at people’s motivation for being alone with activities or in solitude. When engaged in solo activities, motivation for the activities strongly colors experience. The more autonomous the activity one does when alone, the more positive the experience of aloneness. We further distinguished individual differ- ences in preference for spending time alone over with others, which does not specify whether they would find time alone valuable or enjoyable, from the experiences of autonomy for being alone, which entails that one approaches time alone for its experiential benefits. When we separated these two forms of motivation for spending time alone, we found that people’s daily preference for being alone is not linked to introversion or their attachment styles. Conversely, people high in dispositional autonomy appear to be more prone to both prefer and benefit from alone time.

Although aloneness, and solitude in particular, offer opportunities for self‐reflection, one need not be authen- tic even with oneself. We discussed authenticity and time spent alone, proposing that activities that we engage in when spending time alone might either reflect what we find enjoyable and valuable in our life or might be manifestations of our introjects or lack of motivation to engage in meaningful tasks in absence of external contingencies. As such, aloneness might, on the one hand, be an opportunity for individuals to engage in things as an expression of one’s true self and authenticity, or on the other hand, be a time when the pressures that are internalized from daily life infringe upon one’s ability to be at peace with oneself, engendering a sense of inau- thenticity. In other words, people may carry other motivational and self‐evaluative tendencies into their alone time, making it more or less positive and edifying.

Clearly there is much more to study about aloneness and solitude. Time alone impacts emotions and plays a role in their regulation. It also seems that there is considerable variability in people’s experience when they step out of the default mode of social contact and into the private worlds of solitary acts and solitude. Distinguishing effects of both doing activities alone and engaging in solitude per se will help shed light on the important phenomena that occur when the human social animal faces its world, or itself, alone.

# Getting Even Lonelier? Psychological Well‐Being and Problematic Use of Media in the Over‐Connected Society

*“I have absolutely no pleasure in the stimulants in which I sometimes so madly indulge. It has not been in the pursuit of pleasure that I have periled life and reputation and reason. It has been the desperate attempt to escape from torturing memories, from a sense of insupportable loneliness and a dread of some strange impending doom.” — Edgar Allan Poe*

People do not seem to do better than when Edgar Allan Poe lamented about his inescapable loneliness and doom. Journalists and scholars have been using terms like “silent plague” or “epidemic” to emphasize the seri- ousness of loneliness (e.g., Gill, 2014). Numbers support these dreadful terms: Nearly half of Americans always or sometimes feel lonely (46%) or left out (47%) (Cigna, 2018), while another survey showed that more than one in five adult Americans (22%) say that they are always or often lonely (The Economist, 2018). Loneliness is not just America’s plague, but the United Kingdom (UK) also joined the club showing that 23% of adults always or often feel lonely (The Economist, 2018). The epidemic of loneliness has been so grave to the point that the UK became the first country ever to appoint a minister of loneliness to combat this growing plague ( John, 2018). Asians are not doing any better: More than 25% of South Koreans said that they always or very often feel lonely (Korean Research, 2018).

One of the reasons for such global escalation of loneliness might be that more people are living alone than ever. For example, one‐third of households (34%) in the European Union (EU) are single‐person households (Eurostat, 2019), and 28% of Canadians live alone (Grenier, 2017). The increase of single‐person households suggests a decrease in the amount of face‐to‐face interaction, which is crucial for reducing loneliness and increasing psychological well‐being (Kim, 2017; Pea et al., 2012). As a way to compensate for the lack of direct human contacts, today’s individuals rely on mediated communication a lot. Especially, diverse computer‐medi- ated communication (CMC) channels (e.g., social media, short message services, live chat services available in computers or smartphones) have made it easier for people to avoid or replace forming substantive relationships requiring face‐to‐face encounters, time, and effort (Worland, 2015).

Among many mediated communication tools, social media and smartphones have become major channels for mediated interaction. Social media are defined as “forms of media that allow people to communicate and share information using the internet or mobile phones” (Cambridge Dictionary, 2019). Since Facebook’s debut in 2006, close to 2.77 billion people are using social media in 2019. Seventy percent of both East Asians and North Americans use social media respectively, and 67% of Northern Europeans use them. As of July 2019, Facebook is the number one social media platform (2,375 million active users), followed by YouTube (2,000 million active users) and WhatsApp (1,600 million active users) (Clement, 2019). Meanwhile, a smartphone is

defined as “a cell phone that includes additional computer software functions such as e‐mail or an internet browser” (Merriam‐Webster, 2019). Being highly portable, constantly accessible, and loaded with diverse func- tions, smartphones have become the number one device for all the internet‐based services and applications beating personal computers (Gibbs, 2016). The number of smartphone users is expected to surpass 3.3 billion in 2020 (Holst, 2019). More than three‐quarters (77%) of Americans own smartphones, whereas 94% of South Koreans use smartphones, ranking number one in the smartphone penetration rate (Deyan, 2019). People downloaded more than 194 billion applications on their smartphones in 2018, and communication applications such as WhatsApp and Facebook Messenger were the top ranked applications downloaded by users (Sensor Tower, 2019). These statistics support the fact that smartphones have become the major social interaction device exceeding all the other communication tools.

Given that more and more people are living alone and relying on CMC as a major means for social interac- tion than ever, it is natural to ask whether mediated communication can satiate people’s desire to be with oth- ers as much as face‐to‐face interaction, or even replace it. Although it might be hard to provide a definitive answer to this question, the prospect of relieving loneliness via CMC seems gloomy. A small group of studies showed positive effects of CMC on users, including the increase of users’ subjective well‐being (e.g., Kim & Lee, 2011) and perceived social support (e.g., Manago et al., 2012), while diminishing depression (e.g., Grieve et al., 2013) and loneliness (e.g., Pittman & Reich, 2016). However, another and a much larger group of studies demonstrates that it is hard to relieve users’ psychological ill‐being by relying on CMC, and that some individu- als even end up having an additional problem – falling into the trap of problematic use of media, which is defined as excessive or uncontrolled reliance on media (Billieux, 2012) (e.g., Kim, 2018b; Li et al., 2016; Shen & Wang, 2019).

Taking such a negative outlook into account, this chapter discusses the following questions: (1) Is loneliness a cause or an outcome of problematic use of media, or both? (2) Why would lonely people tend to develop problematic use of media more than those who are less lonely? (3) What would help reduce the possibility of developing problematic use of media? In exploring these topics, this chapter suggests a few frameworks that can be useful for navigating the abundant amount of research on the association between problematic use of media and psychological well‐being, especially loneliness. In addition, this chapter attempts to provide a sys- tematic overview of noteworthy research findings for interested readers to have a better understanding of where we are and where we can go from here in this domain of research endeavor.

### Problematic Use of Media

Even though both social media and smartphones were originally designed to facilitate communication with one another by overcoming the limits of space and time, a disquieting phenomenon of problematic use has been observed. A large group of studies shows that heavy use of these media does not seem to do much in alleviating users’ existing problems, but even creates new ones such as problematic, excessive, unhealthy, or addictive use of media (e.g., Kim & Haridakis, 2009; Durak & Seferoğlu, 2019; Nishida et al., 2019; Kross et al., 2013). A group of scholars categorizes problematic use of media as a type of behavioral addictions (e.g., pathological gambling, compulsive shopping, or gaming disorder; Choliz, 2010; Petry & O’Brien, 2013). Such categorization is based on the fact that problematic users of media share similar indicators of those who are suffering from behavioral addiction, such as thinking about the media all the time (preoccupation); feeling anxious, irritable, or bored when not using the media (withdrawal); continual increase in the usage time needed to achieve the same level of satisfaction (tolerance); attempting unsuccessfully to cut back using the media (difficult to control); continued excessive use despite awareness of its serious negative effects on users’ lives (disregard of harmful consequences); loss of interest in other important activities or relationships; relying on the media as a way to alleviate or escape from negative emotional states; lying about media use to others (American Psychiatric Association, 2013; Kim, 2019; Sarkis, 2014; Tao et al., 2013).

In addition to such classic indicators of addiction, excessive smartphone use even puts people in physically

dangerous situations such as texting while driving or walking (Kim, 2019), disturbing sleep, or giving emotional

distress (Choliz, 2010) as well as financial problems (Billieux et al., 2008). One thing that needs to be noted, however, is that spending a lot of time on smartphones does not automatically make one a problematic user. Individuals who have psychological issues, such as high levels of loneliness (Kim et al., 2015), depression (Elhai et al., 2017), ADHD (attention deficit hyperactivity disorder) (Seo et al., 2015), or low levels of self‐esteem (Billieux, 2012) have been found to develop problematic use of smartphones more than those with healthier psychological characteristics (Kim, 2018b). In sum, excessive smartphone use may put people at risk for prob- lematic outcomes, but there may also be preexisting risk factors that increase the likelihood of problematic use. Many researchers have been investigating the worrisome outcomes of problematic use of media as the num- ber of CMC services via computers or smartphones is drastically increasing. Although there is a plethora of studies in this domain, the present chapter focuses on the body of research looking into the association between problematic use of media and users’ psychological well‐being. This group of research can be largely catego- rized into the following three topics (Kim, 2018a): (1) What are psychological factors that make some people rely more heavily on media than others? (2) What are possible psychological consequences for users after/ while using media? (3) Do people’s existing psychological issues improve, or are they exacerbated by media use? Utilizing this categorization scheme, this chapter examines three competing perspectives in explaining the association between loneliness and problematic use of media such as social media, smartphones, or the inter- net in general: (1) Loneliness is a cause of problematic use of media, (2) problematic use of media makes users lonely, and (3) loneliness and problematic use of media have a bidirectional relationship intensifying one another. The following sections discuss these three perspectives and how they are supported in empirical

studies.

### Loneliness as a Cause of Problematic Use of Media, and Mediating Factors Linking the Two

In investigating how lonely people might end up becoming problematic users of media, the definition of loneli- ness can be a good starting point. Loneliness is the perception of deficiency one feels when his/her relationship networks are smaller (quantity) or less satisfying (quality) than one desires (Peplau et al., 1979, p. 55). According to this definition, loneliness is one’s perceived discrepancy between his/her desired amount or quality of rela- tionships and what he/she actually attains (Peplau & Perlman, 1982). Such discrepancy is a threat to humans’ fundamental desire to be connected to others, so loneliness motivates people to repair their deficiency in rela- tionships (Goossens, 2018). Ironically, loneliness can also hinder people’s effort to connect with others. Being isolated or lonely means that there is a lack of support from others, which makes lonely people feel insecure and unprotected during interaction with others. Naturally, as a way to protect themselves from further rejec- tion or hurt, lonely people tend to develop hypervigilance for potential social threats from others (Cacioppo et al., 2017). Thus, lonely people tend to pay more attention to socially threatening cues than welcoming ones, and attribute negative or hostile intentions to others more than reality (Spithoven et al., 2017). This can create a self‐defeating cycle for lonely people: Feeling anxious and doubtful about their ability to create favorable impressions on others ( Jackson & Ebnet, 2006) and being overly sensitive to negative cues from others, lonely people are inclined to avoid social interaction and even prefer spending time alone (Nikitin & Freund, 2017; Spitzberg & Canary, 1985), which eventually intensifies their loneliness. Taken together, lonely people are driven by dual motivations – a motivation to reduce loneliness by connecting to others and a motivation to protect themselves from being rejected by others.

In that sense, one of the safe ways to deal with such conflicting motivations would be to interact with others via CMC channels, rather than face‐to‐face interaction. Face‐to‐face interaction can be a risky choice for lonely people because of its synchronous interaction pattern that allows little time to modify what they want to say verbally or express via nonverbal cues (e.g., gestures, facial expressions, voice, etc.; Kim et al., 2009). CMC might be less threatening to lonely people because they have more opportunities and time to modify what they want to express before they send messages to others in CMC (Kim et al., 2009). Therefore, lonely individuals’

dual and contradictory motivations – connecting with others and avoiding social interaction at the same time – might lead them to prefer mediated communication over face‐to‐face interaction (Caplan, 2005). According to Davis (2001) and Caplan (2005), however, those who rely on media as a way to cope with or escape from loneliness might not be able to alleviate their loneliness. Rather, their loneliness would be intensi- fied, and they might even have a higher chance to develop problematic use of media than those who have lower levels of loneliness (Caplan, 2007; LaRose et al., 2003).

Then why would lonely people have higher chances to develop problematic use of media than those who are less lonely? According to Bandura (1999), the level of self‐control or self‐regulation is one of the key factors in determining who might become problematic users of media or not. Self‐control helps individuals to be aware of their behavior and its impact on themselves as well as others through self‐monitoring (Bandura, 1991). When self‐control is weakened, people are usually governed by immediate gratification, impulses, sensation‐ seeking, and short‐term goals, thus also becoming prone to unregulated use of media (Davis, 2001; Slater, 2003). Psychological ill‐being such as loneliness or depression is known to weaken self‐control, since negative emo- tional states cause an individual to consume the majority of his/her cognitive energy on eliminating or coping with them, leaving not much space for exerting healthy self‐control (Bandura, 1991; Sinha, 2009). Lonely peo- ple’s cognitive and emotional preoccupation with protecting themselves from potential rejection and social threats would also interfere with exerting proper self‐control. Supporting these propositions, a group of studies found that using media to alleviate negative emotional or psychological states (e.g., loneliness or depression) leads to deficient self‐regulation, which eventually increases the possibility of problematic use of media (e.g., Caplan, 2007; Gamez‐Guadix et al., 2012; Özdemir et al., 2014).

Looking more closely into how loneliness occupies individuals’ emotional and cognitive energy, lonely people’s heightened concern to fulfill their need to belong or be connected to others (Baumeister & Leary, 1995) would also work as another factor to deter healthy self‐regulation. Lonely people’s urgent and intensified need to avoid isolation can be explained better by need for social assurance, “a general need for reassurance from at least one or more persons for a sense of belongingness” (Lee & Robbins, 1995, p. 237). Those high in need for social assurance tend to engage in activities that help to maintain and develop rela- tionships with others more than those low in need for social assurance (Baumeister & Leary, 1995). The former tend to have been frustrated from receiving appropriate empathy and support from significant others such as parents or peers during childhood or early adolescence, so they usually lack appropriate social skills and confidence to function independently (Kohut, 1984; Lee & Robbins, 1995; Wolf, 1988). Those with chronic loneliness tend to experience recurrent dissatisfaction with the quantity or quality of their social relationships, not being able to fulfill their need for social assurance. Therefore, it is valid to guess that they would be other‐dependent and seek diverse ways such as CMC to satiate their need for social assurance more than those who are not that lonely.

Need for social assurance cannot be fueled without frequent interactions with others, and today’s smart- phones are an ultimate communication device for incessant connection to others (Kim, 2018b). With voice call, short message services (SMS), social media, or other internet‐based communication applications, smartphones can make users believe that they can be connected to others all the time and anytime, even without ever being alone (Turkle, 2011). This heightened expectation of “being always connected to others” naturally escalates users’ anticipation to get immediate responses from others as well as their paranoia to be always available for others (Atchley & Warden, 2012; Walsh et al., 2011). Such urgency for immediate connection inevitably leads to a high level of dependency on smartphone‐mediated communication services and a strong attachment to a smartphone itself (Kim, 2018b).

Thus, being motivated by heightened needs for both social assurance and immediate connection, lonely people tend to be highly dependent on mediated communication as well as others more than those who are less lonely. Accompanied by their consistent struggles of finding ways to cope with loneliness and being hypervigi- lant toward others’ signs of rejection, obsessions to be assured by and connected to others do not leave much cognitive energy for lonely individuals to maintain healthy self‐regulation. Such deficient self‐regulation would increase the possibility of developing unregulated and problematic reliance on media.

### Loneliness as an Outcome of Problematic Use of Media

Although loneliness has been identified as one of the causes of problematic use of media, another group of studies has shown that loneliness can be an outcome of problematic use of media. For instance, one of the very first research investigating the internet’s effects on users’ psychological well‐being by Kraut and his colleagues (1998) demonstrated that heavy use of the internet reduced the amount of family communication and social engagement, thus increasing loneliness and depression. More recent studies suggest today’s situation might not be that different from that of 1998. Even though many CMC services are available via smartphones and the number of smartphone users has been exploding, loneliness still seems to be haunting us (e.g., Jin & Park, 2013; Yao & Zhong, 2014; Worland, 2015).

Surrounded by many options of media, people rely on mediated interaction much more than before, which generates various and complex issues in users’ well‐being. In terms of social media, it turns out that heavy use hurts how people feel daily and how satisfied they are with their lives (Kross et al., 2013). Verduyn and his colleagues (2015) also found that passive use of social media (i.e., browsing news feed or looking at friends’ postings without posting anything) leads to a decline in users’ affective well‐being. Another study revealed that using social media to compensate for one’s deficient social skills increased peer‐related loneliness rather than reducing it (Teppers et al., 2014). Furthermore, problematic use of social media turned out to induce higher alienation to peers and lower levels of emotional stability (Assunção & Matos, 2017), and even increase the pos- sibility of substance use (Hormes et al., 2014). Meanwhile, problematic use of smartphone has been found to increase depression and anxiety (Coyne et al., 2019), while lowering self‐esteem (Elhai et al., 2017). Finally, problematic use of the internet causes both physical (e.g., going to bed late, skipping meals) and psychosocial issues (e.g., restlessness, anger, decreased relationships with family and friends, boredom) (Gur et al., 2015). Taken together, problematic use of media (social media, smartphone, the internet) seems to increase physical as well as psychological ill‐being of users.

With so many CMC applications available in smartphones, today’s “smartphone‐smart” young people are virtually connected to others more than any generation in history. However, looking at others’ (usually happy) postings or waiting for someone from their long lists of social media friends to contact them does not seem to reduce their feeling of isolation. Instead, excessive reliance on smartphones or social media seems to replace offline social interaction opportunities and increase loneliness (Kim et al., 2009). Supporting such “more reli- ance on mediated communication, the lonelier” proposition, a group of recent surveys found that today’s young people are lonelier than older ones. According to BBC Radio 4’s survey, two in five (around 40%) of UK youngsters aged 16–24 feel lonely often or very often, compared to 29% of those aged 65–74 and 27% of those aged 75 and older (Quine, 2018). Americans aged 18–22 also turned out to be the loneliest generation, while those in the range of 72 and older are the least lonely (Cigna, 2018). In Japan, more than half a million Japaneses under 40 have not left their houses nor interacted with others face‐to‐face for at least six months (The Japan Times, 2016). Overall, the fact that today’s young people suffer from loneliness more than older ones implies that relying on and being competent with a larger number of mediated communication channels does reduce, but rather increase loneliness.

### Vicious Bidirectional Cycle Between Loneliness and Problematic Use of Media

Even though a lot of studies have insinuated causal associations between users’ psychological issues and prob- lematic use of media, most of those studies used cross‐sectional data that cannot determine the direction between causes and effects clearly (Kim et al., 2009; Kim et al., 2015). Given that causes should occur before outcomes, using data that are collected at just one time point has an inherent limitation in claiming causality among variables. That is why there has been a consistent call for longitudinal investigations on the causal asso- ciation between problematic use of media and users’ psychological well‐being/ill‐being. However, because of many challenges in longitudinal data collection procedures (e.g., high dropout rates of participants), there have not been many studies examining time‐order causality between the two.

Still, in response to this demand, a small but growing number of studies have been putting efforts into scru- tinizing the possibility of a bidirectional vicious cycle between loneliness and problematic use of media (e.g., Kim et al., 2009; Yao & Zhong, 2014). The vicious cycle can start from problematic reliance on media, which would increase loneliness by taking users’ time and investment away from face‐to‐face interaction. The reduced opportunities to connect with others face‐to‐face drives people to depend even more on mediated communica- tion as one of the few remaining options for their social interactions. As found in previous research, desperately relying on mediated communication as a way to cope with or alleviate loneliness would intensify users’ already problematic use of media.

On the other hand, the vicious cycle might start from loneliness, in which lonely people tend to rely on media as a way to compensate for their deficient offline social interactions. However, they would end up devel- oping problematic use of media because of their weakened self‐regulation, strong attachment to and depend- ence on media, and intense needs for social assurance as well as immediate connection. Such uninhibited reliance on media might produce heightened but unfulfilled expectation of being connected to others all the time, while reducing their opportunities to build meaningful relationships with others in constructive ways, and eventually intensify their loneliness.

Interestingly, one of the very few studies investigating the full bidirectional association between loneliness and problematic use of media is actually the first longitudinal study investigating the effects of the internet on users’ well‐being by the HomeNet project (Kraut et al., 1998). This study showed that the more people used the internet, the lonelier and more depressed they got compared to two years ago when the participants had first joined the project. A similar result was found for adolescents who used instant messengers excessively for six months and ended up having higher levels of depression than before (van den Eijnden et al., 2008). Drawn from these two studies’ findings, it seems that people’s existing psychological issues are exacerbated rather than diminished by relying on media as a remedy for their psychological ill‐being or deficient social relationships.

Pertaining to smartphones, a recent study employed cross‐lagged path models to clarify causal relationships among loneliness, problematic use of smartphones, and other communication‐related factors such as need for social assurance, time spent on face‐to‐face interaction, and time spent on smartphone‐mediated communica- tion over the course of four months (Kim, 2019). Cross‐lagged path model anlaysis is designed to test a longitudinal influence of one variable on the other, after controlling for the stability of each variable over time (Finkel, 1995). This study tested two rival perspectives on the association between loneliness and problematic use of media – whether loneliness is a cause or an outcome of problematic use of media. In this study, loneliness turned out to increase problematic use of smartphones after four months, while problematic use of smartphones did not increase loneliness. At the same time, problematic use of smartphones reduced users’ time spent on face‐to‐ face interaction that is known to increase positive social feelings and reduce one’s urge to rely on media (Pea et al., 2012). This finding is in line with previous studies showing that heavy use of TV (Perse & Rubin, 1990) or the internet (Kraut et al., 1998) took time away from face‐to‐face interaction and social engagement.

Another interesting and noteworthy finding of the aforementioned smartphone study (Kim, 2019) was that problematic use of smartphones also increased users’ need for social assurance, which eventually led to aug- mented loneliness. Indeed, heavy or excessive reliance on smartphones seems to amplify users’ need for social assurance by creating the illusion of always being connected to others. However, such “always being connected to others” illusion will never be realized, and the gap between the augmented anticipation of incessant connec- tion with others and the reality of delayed or unrequited communication would inevitably discourage users. Such a vastly augmented, but unreachable mirage of “always being with others” via smartphones seems aston- ishingly similar to the classic definition of loneliness – perceived discrepancy between one’s desired level of social relationships and what one actually achieves (Peplau & Perlman, 1982).

In short, lonely individuals rely on diverse mediated communication services as a way to compensate for their deficient social relationships, but are likely to replace (their already not that sufficient) face‐to‐face interac- tion with problematic reliance on them. The illusory incessant availability of others will never be realized for lonely people, but instead intensify their thirst for social assurance. Like the parched drinking salty water, the more users are obsessed with mediated interaction to quench their need to be assured by others, the lonelier they get (see Figure 17.1).

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### Two Competing Theoretical Models to Explain the Bidirectional Cycle

Such a vicious bidirectional cycle between loneliness and problematic use of media can be explained by social enhancement model (Kraut et al., 2002). This model is also called “the rich get richer, the poor get poorer” view, positing that individuals with affluent offline social resources and satisfactory social relationships would benefit more from online interactions than those who are deficient in offline social resources. “The social resource rich” tend to be confident in building as well as expanding their already well‐off relationship net- works, with support and protection from their existing social resources. In the meantime, “the social resource poor” tend to be incompetent in interacting with others online as offline, without much social protection to count on and with much distress from being anxious to compensate for what they lack offline (Han et al., 2012; Kim, 2017; Kim, 2018a). The difference between these two groups majorly depends on the amount of one’s existing social resources, which also affects his/her level of loneliness. Thus, it is natural for “the social resource poor” to feel lonelier and more anxious and less confident about communicating with others than “the social resource rich.” In that sense, this model suggests that relying on media as a remedy for one’s existing psycho- logical issues or unsatisfactory social relationships would not improve his/her situation much, but rather worsen it. The social enhancement model was also supported by the follow up study of Kraut et al.’s (1998) project, by showing that using the internet increased self‐esteem and decreased loneliness only for extroverts who are already well‐off with their existing social resources, while the outcomes were reversed for introverts (Kraut et al., 2002).

On the contrary, another perspective called social compensation model (McKenna & Bargh, 1998) suggests that individuals who are lacking in social resources offline would benefit more from online interaction than those who have affluent offline social resources. This view is also called “the poor get richer” model in the sense that “the social resource poor” would benefit more from online social interaction than “the social resource rich.” This is because the former have more time and are more eager to develop relationships online than the latter who are already enjoying satisfactory offline social resources (Han et al., 2012; Kim, 2017; Kim, 2018a). According to this model, lonely individuals are expected to compensate for their deficient offline social relation- ships via online interaction and alleviate their loneliness. So far, however, to the best of the author’s knowledge, there has not been any study supporting the positive bidirectional cycle between heavy reliance on mediated communication and alleviation of loneliness.

Taken together, it seems that lonely people get even lonelier from relying on mediated communication rather than successfully coping with their issue. Lonely people usually do not have sufficent offline social resources and would be heavily dependent on mediated communication channels to alleviate their negative emotional states or compensate for their deficient offline social relationships. However, their psychological characteristics may persist across offline and online, and may not be successful in building or expanding social relationships online. Being preoccupied, but unfulfilled with the need to be assured by and connected to others, lonely people would even become lonelier.

### Buffers to Problematic Use of Media: Face‐to‐Face Interaction and Social Support

This chapter has been implying that relying on media, especially CMC services, does not play a positive role in lessening loneliness or promoting psychological well‐being of users. Such speculation has been supported by a recent national survey of more than 20,000 U.S. adults ages 18 and older, showing that social media does not help to reduce loneliness. Rather, this survey underscores the effectiveness of old‐fashioned but virtuous rem- edies for loneliness: The amount of face‐to‐face interaction, living with others, and time spent with family turned out to be significant predictors of the decline in loneliness (Cigna, 2018). These survey findings highlight the importance of primary offline relationships and face‐to‐face interaction in reducing one’s psycho- logical ill‐being and a small group of studies resonates with them (e.g., Pea et al., 2012; Kim, 2017).

Acknowledging the necessity of looking into one’s primary relationships in explaining a person’s psychologi- cal well‐being as well as the possibility of developing problematic use of media, some scholars have started to pay attention to people’s relationships with family members or significant others, even during their childhoods. For example, a study showed that the positive relationship with one’s father reduced the probability of develop- ing problematic use of social media (Lee et al., 2017). Similarly, problematic use of the internet turned out to be positively associated with bad peer relationships and low levels of communication with mother (Park et al., 2014). Childhood maltreatment such as abusive parenting ( Jahng, 2019; Wang & Qi, 2017; Worsley et al., 2018) or neglect (Emirtekin et al., 2019; Kwak et al., 2018) is positively associated with problematic use of smart- phones as well as the internet, mediated by depression and social anxiety. Both anxious attachment (Worsley et al., 2018) and avoidant attachment (Kim & Koh, 2018), as outcomes of childhood maltreatment, are also found to increase the possibility of problematic use of smartphones and social media.

In addition to the quality of relationships with significant others, the amount of daily face‐to‐face interaction turned out to be a crucial buffer to both loneliness (Cigna, 2018) and problematic use of media (Kim, 2017). A study observed what happens to lonely individuals when they attempt to relieve their loneliness via two routes of social interaction – face‐to‐face interaction vs. smartphone‐mediated communication (i.e., social media and short message services) (Kim, 2017). Face‐to‐face interaction turned out to have a positive influence on partici- pants’ well‐being by increasing their perceived social support, but smartphone‐mediated communication did not. Face‐to‐face interaction also diminished lonely individuals’ chances of falling into the trap of problematic use of smartphone, while relying on smartphone‐mediated communication increased the chance (Kim, 2017). Such an important role of face‐to‐face interaction in improving media users’ overall well‐being (e.g., more sleep hours, positive feelings, social success) as well as in reducing the probability of developing problematic use of media has not been investigated much except for a small group of studies (e.g., Pea et al., 2012), and needs to be explored more as a promising avenue for intervention.

Another probable buffer to psychological ill‐being and problematic use of media is social support given to or perceived by media users. The positive effects of (perceived) social support has been verified by a group of stud- ies, such as decreasing depression (Finch et al., 1999), improving social adjustment (Dunkel‐Schetter, 1984), and heightening self‐esteem (Feather & Wainstock, 1989). Not only does (perceived) social support advance indi- viduals’ well‐being directly, but it also indirectly influences well‐being by affecting their choices of coping strat- egies when they have to deal with various life problems. For instance, the more social support breast cancer patients receive, the more likely they select active and positive coping strategies to deal with cancer, which eventually improve their emotional well‐being (Kim et al., 2010). Pertaining to problematic use of media, (per- ceived) social support was found to reduce the probability of developing problematic use of the internet by helping users maintain appropriate amount of time spent on the internet as well as healthy emotional regula- tion (Mo et al., 2018). A meta‐analysis of 76 studies with Chinese participants showed that there is a medium‐ sized negative correlation between social support and problematic use of the internet (Lei et al., 2018).

Overall, the aforementioned research focuses on the effects of social support gained from sound relation- ships with significant others and face‐to‐face interaction as buffers to loneliness and problematic use of media. Some studies show that social support received offline is negatively associated with problematic use of the internet, while social support received online is positively associated with problematic use of the internet

(e.g., Lin et al., 2018; Mazzoni et al., 2016). Still, there is another group of studies demonstrating the value of online social support in improving users’ psychological well‐being. In terms of social media, users tend to pre- sent their refined or positive sides of themselves most of the time, rather than showing honest or even discour- aging facets. However, a few studies found that when users take courage and share their honest fear, hurt, or despair online, such candid revelation draws supporting comments from their friends on social media (Kim & Lee, 2011; Lee & Noh, 2013). Joinson (2001) advocates that self‐disclosure plays a major role in building mean- ingful social relationships, both in offline and online contexts.

In sum, it seems that the most effective buffers against loneliness and problematic use of media are orthodox and primal means of social interaction – maintaining good relationships with significant others and having a lot of face‐to‐face interactions, rather than relying much on CMC, which has become the most common way to interact with others today.

### Where Do We Go From Here?

So far, this chapter has provided a systematic overview on what has been found and discussed in the domain of research investigating the association between loneliness and problematic use of media. Although an exploding amount of studies has been coming out in this domain of research, there are still some challenges that need to be tackled. With a huge number of CMC technologies permeating our everyday lives, analyzing dynamic and even bidirectional associations between problematic use of media and users’ psychological well‐being is becom- ing very complex. For example, it is very hard to tell when and how relatively healthy and controllable habits of media use turn into problematic use without closely looking into gradual changes of individuals’ daily lives and media use activities. Experimental manipulation that strictly controls users’ behaviors and environments can be one way to clarify the vibrant association between the two. However, considering how many media have become inseparable from our daily activities, it is extremely important to observe what we do with media in our everyday routines and interaction with others without much artificial intrusion. Therefore, ideally, longi- tudinal observation combined with regular dairy writing, interviews, surveys, and accurate estimation of media use time and activities would help us understand what is truly going on between users’ psychological well‐being and problematic use of media.

In addition to the difficulty of inspecting one’s long‐term changes in media use behaviors and states of psy- chological well‐being, another big challenge is measuring one’s media use behavior itself accurately. Particularly, with people’s growing tendency to engage in media multitasking (e.g., watching videos, exchanging texts with others, listening to music, and looking up information all at the same time) (Potter, 2012), relying on users’ memory and self‐report on how much time they spend on specific media features or content becomes very suspect. Responding to such challenges, researchers are encouraged to use log data that can be achieved via tracking software embedded in smartphones or computers. Of course, how much of the users’ attention is paid to each of the multiple media is another huge hurdle to overcome. Overall, coming up with creative and valid ways to measure time and attention spent on each media feature as well as face‐to‐face interaction is a very challenging, but necessary step to advance this domain of research.

Another newly emerging and interesting area that needs more attention is social interaction with machine or artificial intelligence (AI), and how it affects humans. Communicative AI pushes and challenges the bound- ary of human communication, which has long been based on the anthropocentric (communication is possible only between humans) perspective. Facing the rise of these “non‐human communicators,” scholars are explor- ing questions, such as what functions AI can do as communicators, what kinds of new relational dynamics might appear between humans and AI, and what constitutes human after all (Guzman & Lewis, 2019). Considering that people communicate with others to fulfill the needs to belong and be connected to others, whether people can gain social or emotional support from interaction with AI has been a fascinating topic to investigate. In fact, some of the early studies on human‐computer interaction found that computer agents’ expression of empathic emotion increased human users’ positive ratings of the agents in the areas of likeability, trustworthiness, caring, and support (e.g., Brave et al., 2005). Reflecting on such findings, there have been

consistent efforts to develop robots that can be used for social care, such as physically assistive robots for people with physical disabilities, and socially assistive robots to aid users’ daily activities or improve their psychological status. However, the effectiveness of AI or robots in providing social or emotional care for humans has not been investigated much, due to the fact that many of these technologies have yet to move from concepts or early prototype states to wider application (Consilium Research & Consultancy, 2018). Still, provided that AI and machines can be 24/7 available for users without ever sleeping or being tired, it would be enthralling to inves- tigate whether the illusory expectation of “being always connected to others” can be truly realized or some unexpected side effects would be brought about.

### Conclusion

We are living in probably the most connected world, but at the same time, the loneliest era. Such irony might be due the potential vicious bidirectional cycle between loneliness and problematic reliance on media. That is, we rely on or are even obsessed with media to alleviate our negative emotions or compensate for unsatisfactory relationships, but we do not seem to gain what we want from the ever‐present flood of media. Although today’s ubiquitous media definitely foster the illusion of “always being connected to others,” such augmented expectation is never fully met, which eventually makes us even lonelier. Being replaced by media and mediated communication, the reduction in quality and quantity of face‐to‐face interaction also seems to intensify our loneliness. Regardless of such gloomy perspective, still, we cannot give up on our traditional ways of connect- ing with others, because maintaining good relationships with significant others and spending much time on face‐to‐face interaction do reduce loneliness. It is truly notable and incongruous that the most basic and old‐ fashioned way of communication turns out to be one of the few effective remedies for loneliness in this era of unprecedentedly abundant mediated communication technologies.

### New Media and Solitude: Implications for Peer Relations

Digital technology continues to permeate young peoples’ lives. Nearly all U.S. teenagers and emerging adults report having access to a smartphone and a large majority report using social networking sites (SNSs; Anderson & Jiang, 2018; Perrin & Anderson, 2019). These technologies are often used to connect with others. For example, young people commonly use SNSs to connect with their offline friends (Reich et al., 2012), and approximately one‐third of teenagers report that texting is their favorite way to communicate with friends, surpassing in‐person communication (Rideout & Robb, 2018). Despite the innate social nature of these popu- lar types of new media, there is concern about potential negative effects these technologies have for young people’s social adjustment, including their experiences with solitude. For example, prominent voices argue that contemporary technologies facilitate an environment in which young people are “alone together,” in which people may be physically present with each other, but each absorbed in their own individual online networks (Turkle, 2011). However, others argue that digital technologies can invite both social isolation and social connection (Clark et al., 2018). These inconsistent relations may be explained by considering *who* is using digital technology and *what* they are doing (Odgers & Jensen, 2020), rather than assessing general, uni- form effects.

In this chapter, we consider how SNSs and mobile phones (namely, smartphones) relate to young peo- ple’s solitude, with a particular focus on adolescents and emerging adults (ages 10– 29). We focus on SNSs and mobile phones, rather than other types of media (e.g., video games), due to their primary role in facili- tating connection with others, especially peers. Digital technology research has rarely considered solitude specifically. Thus, we also consider other indices relevant to young people’s social adjustment, including loneliness, social anxiety, and social exclusion and victimization. We integrate implications that digital technology use has for young people’s solitude, as well as their social withdrawal. Social withdrawal is defined as “the expression of solitude or aloneness in the presence of peers” (Rubin et al., 2018, p. 323), and comprises of three dimensions (Asendorpf, 1990; Coplan et al., 2015; Rubin et al., 2018). Those higher in shyness both crave and fear social interactions, with high approach and high avoidance tendencies. In con- trast, those higher in unsociability do not initiate social interactions, but do not necessarily avoid them either, and demonstrate low approach and low avoidance tendencies. Finally, those higher in social avoid- ance do not crave and also avoid social interactions, engaging in low approach and high avoidance tendencies.

### Theoretical Overview

People have a fundamental need to belong, characterized by a desire to form and sustain interpersonal connections (Baumeister & Leary, 1995). Social connections with peers are especially important for young peo- ple (Collins & Laursen, 2004). If both SNSs (Reich et al., 2012) and smartphones (Rideout & Robb, 2018) facili- tate communication with peers, then digital technology plays a dominant role in understanding contemporary young peoples’ peer relations. Competing theories explain how these digital technologies affect peer relations, and implications for young people’s overall social adjustment.

First, according to the displacement hypothesis, online interactions replace time with offline connections (Kraut et al., 1998; Neuman, 1988). Although the displacement hypothesis is often utilized as an explanatory framework when assessing links between digital technology and mental health, few methodologically rigorous studies (e.g., experimental, longitudinal) have explicitly tested if using digital technology directly takes time away from offline social experiences. Overall, there is evidence that offline social activities have declined over recent decades, whereas online time has increased (Vilhelmson et al., 2018). One study found that those who deactivated their Facebook account for four weeks increased time in socializing with family and friends (Allcott et al., 2020), and another found that smartphone dependency prospectively predicts less face‐to‐face interaction (Kim, 2019). However, other studies find no evidence that digital technology displaces face‐to‐face communica- tion (Dienlin et al., 2017; Hall, Johnson, et al., 2019; Hall, Kearney, et al., 2019), and that online communication can increase face‐to‐face communication over time (Dienlin et al., 2017).

Second, according to co‐construction theory, young people’s online and offline lives complement and parallel each other, with young people utilizing online environments to fulfill developmental tasks (Subrahmanyam et al., 2006). Applying this theory to peer relations, how young people interact with their peers in online settings reflects their interactions with peers in offline settings. For example, emerging adults who engage in prosocial behavior face‐to‐face also engage in prosocial behavior online (Wright & Li, 2011). Moreover, as suggested by the rich‐get‐richer hypothesis, highly sociable individuals will reap the social benefits that online environments such as SNSs and text messaging afford (Kraut et al., 2002). In contrast, those who are socially “poorer” may not engage in the social features of digital technology, with some evidence suggesting that socially avoidant individu- als utilize online environments to engage in nonsocial activities, such as solitary gaming (Nelson et al., 2016).

Third, the transformation approach suggests that contemporary digital technologies transform young peoples’ peer relations through the affordances tied to these technologies (Nesi et al., 2018a, 2018b). Peers are now essentially accessible anytime and anywhere, with their content available for constant viewing and for providing likes and comments. Digital technology may transform how socially reticent and withdrawn young people experience peer relations. According to the social compensation hypothesis, individuals who struggle socially offline benefit more from online communication, as they are able to form new connections with other people, as well as “practice” their social skills (Kraut et al., 2002). For example, socially anxious adolescents may feel more at ease talking in online settings (Valkenburg & Peter, 2007), and shy individuals may find online social interactions more comfortable due to greater control and lack of nonverbal cues, which in turn may facilitate greater feelings of closeness and social support (Baker & Oswald, 2010). Moreover, there is evidence that shy adolescents who have more friends exclusively online increase in self‐esteem, which in turn predicts more friendships that occur both offline and online, as well as exclusively offline (Van Zalk et al., 2014).

These theories suggest that digital technology use may displace, reflect, and transform young people’s social experiences. In the following sections, we review empirical research examining digital technology use and young people’s social adjustment, and how these findings relate to these overarching theories.

### Mobile Phone Use

In this section, we consider how mobile phone use relates to young people’s social adjustment. Smartphone access in particular is nearly ubiquitous among young people (Anderson & Jiang, 2018). As a medium, smart- phones are highly diverse with a host of features and affordances. Some of these features (e.g., texting) center

around social connection, whereas others (e.g., solitary gaming) involve no social connection. Research is still needed that examines how different smartphone features uniquely relate to young people’s social adjustment, but there are numerous studies that have examined a) how mobile phone use in the moment disrupts face‐to‐ face interactions, and b) how texting relates to social adjustment.

*Phones and face‐to‐face interactions.* Instances of momentary displacement can be facilitated by mobile phones, as the accessible nature of these devices may render them an easy vehicle to turn away from face‐to‐face socializing opportunities (cf. Turkle, 2011). The notion of utilizing one’s phone during face‐to‐face interactions is captured by the newly coined constructs of technoference (i.e., when social interaction is interrupted due to technology; McDaniel, 2015) and phubbing (i.e., phone snubbing, in which individuals focus on their phone instead of an in‐person communication partner; Roberts & David, 2016). On the one hand, turning to one’s phone may be attractive for those higher in any dimension of social withdrawal, as those who are wary of (shy), uninterested in (unsocial), or wish to avoid (avoidant) social interactions may be quick to turn to a tool of escape in social situations. On the other hand, during alone time, socially withdrawn young people with a greater preference for solitude (such as unsociable and socially avoidant individuals) may be less likely to engage in phone use, at least in respect to social phone use. For example, there is evidence that those with a higher capacity for solitude are less likely to engage in smartphone use while alone (Diefenbach & Borrmann, 2019), perhaps because smartphones may disrupt feelings of being truly alone (cf. Thomas et al., 2020).

Several studies have explicitly examined mobile phone use during face‐to‐face interactions. An observa- tional study of student dyads in a restaurant found that phone use occurred in the majority of the observed dyads, and that participants whose dyadic partner engaged in phone checking reported lower conversation intimacy (Vanden Abeele et al., 2019). A study examining college students found that greater phone use when interacting with a close friend is associated with lower interaction quality (Brown et al., 2016). A daily diary study found that college students reported greater feelings of distraction and lower enjoyment if they used a smartphone during a face‐to‐face interaction compared to when they did not (Dwyer et al., 2018). In college students, having access to one’s phone reduced the likelihood of interacting with a stranger while ostensibly waiting for a research study to begin (Kushlev et al., 2019). College students who were able to use their phones while finding a building on a college campus were less likely to converse with others for direc- tions and felt less socially connected than those who could not use their phones (Kushlev et al., 2017).

Strikingly, there is also evidence that the mere presence of phones can disrupt face‐to‐face interactions. The presence of a phone while sharing a meal with friends reduced interest and enjoyment (Dwyer et al., 2018). Similarly, the presence of a phone during adults’ face‐to‐face conversations in a coffee shop was related to reports of poorer conversation quality (Misra et al., 2016). While adult strangers were conversing with each other, the presence of a phone reduced relationship quality, especially when instructed to engage in a meaningful rather than casual conversation (Przybylski & Weinstein, 2013). Taken together, these findings suggest that the use or presence of one’s phone while in‐person with peers may detract from these face‐to‐ face interactions, an area of concern given the developmental importance of peers for young people.

*Mobile phone use and texting.* As a whole, mobile phone use has mixed relations with social adjustment. Some evidence indicates that college students’ smartphone dependency, but not smartphone use, is cross‐sectionally linked to lower relationship satisfaction and greater loneliness (Lapierre, 2020), and prospectively predicts loneliness (Lapierre et al., 2019). However, other evidence suggests that loneliness prospectively predicts smartphone dependency, and not the reverse (Kim, 2019), and that smartphone use may be related to less loneliness for those who engage in higher self‐disclosure (Karsay et al., 2019).

There is some evidence that those higher in social anxiety endorse texting as a more comfortable venue for communication (Pierce, 2009; Trub & Barbot, 2020). In college students, the number of texts sent and received is linked to lower loneliness when controlling for total time spent texting overall; a separate analysis found that the number of texts sent and received was linked to greater relationship satisfaction and intimacy, although time spent texting overall was linked to lower relationship satisfaction (Park et al., 2016).

Moreover, those who follow higher texting trajectories report having closer friendships than those who fol- low a moderate texting trajectory (Coyne et al., 2018). In sum, texting appears to be associated with more positive social adjustment, and, in line with the social compensation hypothesis, may be particularly benefi- cial for those who have preexisting social problems. In respect to implications for social withdrawal, shyer individuals who want to interact with others but who are afraid may be drawn to text messaging as a plat- form that is less anxiety‐provoking and easier to communicate in. Associations with unsociability may be more complex. Those higher in unsociability are less likely to initiate social interactions, but evidence with children suggests they do not appear to turn down peer bids to play and interact (Coplan et al., 2004). Thus, although these individuals may be less likely to initiate text message exchanges, they may be just as likely as non‐withdrawn young people to respond when others initiate these exchanges. In contrast, those higher in social avoidance may be unlikely to both initiate and respond to text messages.

### Social Networking Site Use

Researchers have identified three central types of SNS use: active public use (i.e., posting content to an audi- ence, such as status updates and photos), active private use (i.e., communicating to others in a private setting, such as direct or instant messaging), and passive use (i.e., scrolling through others’ content without direct interaction; Frison & Eggermont, 2020). In this section, we consider each type separately, and consider the implications that each has for social withdrawal.

*Active public use.* Research on active public use and social adjustment is generally mixed. One meta‐analysis found that the amount of SNS self‐presentation (characterized by more frequent status updates and photo uploads) was not associated with psychological well‐being (Liu et al., 2019). Among mainly adult Facebook users, active public use has mixed associations with loneliness (Burke et al., 2010; Ryan & Xenos, 2011; Scott et al., 2018), and no association with social anxiety (Scott et al., 2018; Shaw et al., 2015) or thwarted belongingness (Macrynikola & Miranda, 2019). An experimental study found that, for undergraduate students, posting more Facebook status updates than normal decreased loneliness compared to students who did not change their status update habits (große Deters & Mehl, 2012). This effect was mediated by feelings of social connectedness, and was not moderated by receiving comments on the status updates. A daily diary study among undergraduates found that posting on Facebook was associated with more positive emotional valence ten minutes after the post was made, but these findings did not extend to 30 minutes after the post was made (Bayer et al., 2018).

Importantly, the content of the post may matter: whereas posting positive Facebook statuses is correlated with lower depressive symptoms, posting negative statuses is associated with greater depressive symptoms (Scherr & Brunet, 2017). Among adolescents, loneliness is cross‐sectionally associated with greater active pub- lic Facebook use, but active public use prospectively predicts receiving positive Facebook feedback, which in turn is associated with greater perceived friend support (Frison & Eggermont, 2020). Additional work suggests a curvilinear relation between loneliness and active public Facebook use, in which use predicts lower social and emotional loneliness for low and moderate users, but higher social and emotional loneliness for heavier users (Wang et al., 2018).

These findings suggest that active public use may be related to better social adjustment, but effects may be fleeting and occur only in certain circumstances. For young people who report greater shyness, active use may be a “safer” route in connecting with others compared to face‐to‐face interactions. However, due to strong fears of negative evaluation and rejection sensitivity, shyer young people may also feel daunted to post something that would potentially be viewed and scrutinized by a large audience. Indeed, one meta‐ analysis found a negative relation between shyness and active SNS use (Appel & Gnambs, 2019). It is likely that key situational moderators may influence the extent to which those higher in shyness actively post. For example, many young people report having SNS accounts that are private except to a select group of peo- ple (e.g., “Finsta” accounts; Duffy & Chan, 2019). Those higher in shyness may find it more attractive to

post to these accounts, compared to accounts where posts are seen by a wider audience. Those higher in shyness may also be drawn to anonymous SNS platforms (e.g., Reddit), suggesting a need to examine potential differences across platforms. In contrast, those higher in unsociability and social avoidance, both of whom have preferences for solitude, may find actively posting to SNSs less appealing, so long as the intent of these posts is to engage in some level of social connection (i.e., to receive likes and comments from an audience). There is some evidence that those higher in social avoidance engage less with technolo- gies that facilitate social connection, such as e‐mailing and social networking (Nelson et al., 2016). This association was not observed for those higher in unsociability. More research is needed to determine under which circumstances unsociable young people may be drawn to active use, if at all.

*Active private use.* As previously noted, active private use is characterized by direct messaging and communication in private settings; for the purposes of this review, research on instant messaging is also discussed. One meta‐analysis found that instant messaging is not associated with psychological well‐being, but direct interaction on SNSs is positively associated with well‐being (Liu et al., 2019). Other studies primarily with adults have found inconsistent associations between active private use and social adjustment (Dienlin et al., 2017; Macrynikola & Miranda, 2019; Ryan & Xenos, 2011; Shaw et al., 2015). In adolescents, however, active private use prospectively predicts greater perceived friend support and online social support (Frison & Eggermont, 2020; Frison et al., 2019), although no association with loneliness has been found (Frison & Eggermont, 2020). Other evidence with adolescents suggests that social anxiety is cross‐sectionally related to lower levels of chatting online, and chatting online is related to greater feelings of closeness to friends (Valkenburg & Peter, 2007). Thus, for young people, especially younger adolescents who may be limited in their ability to interact with peers face‐to‐face due to practicality issues (e.g., not having a driver’s license), private communication tools may play a key role in connecting with peers (also see Ehrenreich et al., 2020). Importantly, however, active private use may also provide a new context to engage in problematic behaviors, such as co‐rumination (Frison et al., 2019), again suggesting that type of content matters in considering implications for social adjustment.

On the one hand, private active use may be appealing for those higher in shyness as it can provide a safer venue for communication, without the large audience that active public use presents. On the other hand, there is evidence that those higher in shyness are less attracted to active private platforms that are more synchronous with expectations of immediate responses (i.e., instant and direct messaging), and more attracted to asynchro- nous platforms such as e‐mail (Chan, 2011). Thus, social norms (e.g., expectations of immediate responses) and situational characteristics (e.g., the use of features such as “Read Receipts,” in which private messaging users see if the recipient has read the sent message, which may enhance pressure for quick responses; Pielot et al., 2014) may influence how attractive private messaging platforms are to those higher in shyness. As active private use operates similarly to texting, it is possible that young people higher in unsociability and social avoid- ance may respond to private messages as they would to text messages. Specifically, young people higher in unsociability may not necessarily initiate but may not turn down private messaging exchanges, whereas those higher in social avoidance may be more likely to eschew private messaging.

*Passive use.* Most studies examining links between SNS use and social adjustment investigate general SNS use, which meta‐analyses suggest have small correlations with greater loneliness (Huang, 2017; Liu & Baumeister, 2016; Song et al., 2014; but see Cheng et al., 2019, which found no overall relation) and social anxiety (Cheng et al., 2019). However, these associations may be driven by passive use (i.e., scrolling without direct interaction), as other types of SNS use (e.g., active use) have no or even positive relations with well‐being (Liu et al., 2019). Negative relations with indices of social adjustment could be due to two reasons. First, passive use may be a form of “social snacking,” in which users perceive social need fulfillment by viewing others’ social content, but actual social connection is not fulfilled as users did not directly connect with others (Clark et al., 2018). Second, people tend to post highly positive content on SNSs (Vogel & Rose, 2016). Exposure to this content may enhance the tendency to perceive that others lead more

rewarding social lives than the self (Deri et al., 2017) via social comparison processes. This may be especially problematic for young people exposed to peer content, as people have a tendency to compare themselves to similar others (Festinger, 1954).

Empirical research suggests that greater passive SNS use is linked to poorer social adjustment. Studies examining adult Facebook users find that greater passive Facebook use is associated with greater loneliness (Burke et al., 2010) and greater social anxiety symptoms (Shaw et al., 2015), although a study with under- graduates did not find a link between passive Facebook use and thwarted belongingness (Macrynikola & Miranda, 2019). A daily diary study with undergraduate students demonstrated that although passive SNS use did not predict later feelings of loneliness, loneliness predicted subsequent SNS use (Aalbers et al., 2019), suggesting that lonely individuals may be engaging in “social snacking” in an attempt to fulfill social needs. Importantly, a study on adolescents found that emotional loneliness was associated with greater passive Facebook use cross‐sectionally, and that passive Facebook use was related to decreased perceptions of friend support over time (Frison & Eggermont, 2020), providing some support that this “social snacking” behavior may not successfully fulfill social needs.

These studies suggest that passive SNS use is associated with poorer social adjustment, although more longitudinal work is needed to confirm temporality. Shyer individuals may be especially attracted to passive SNS use, as it could be a way to exercise their high approach tendencies in a less threatening environment. Moreover, passive behaviors may allow them to engage in trivial contact with others in the form of one‐ click communication such as likes, which may be less daunting than clearer forms of active use such as leaving comments. However, one meta‐analysis found a small, positive but nonsignificant association between shyness and passive use, although this was only based on four studies (Appel & Gnambs, 2019), highlighting a need for additional research. Additionally, regardless of frequency, there is some evidence that shyer emerging adults engage in more social comparisons (Nelson, 2013), suggesting that these indi- viduals may be more negatively affected by browsing others’ positive SNS content. In contrast, those higher in unsociability and social avoidance may be less drawn to passive use, as they may be less interested in others’ content. Moreover, those higher in social avoidance engage in fewer social comparisons (at least for men; Nelson, 2013), indicating that they may be less negatively affected by browsing if and when they do engage in this behavior. Importantly, the content available to browse through on SNSs is not exclusively social. Although viewing peer content comprises a significant portion of the content that young people are exposed to on SNSs, nonsocial content such as memes is also highly prevalent (Burnell, 2020), and those higher in unsociability and perhaps especially social avoidance may be drawn to passively browsing this content. Given that social avoidance is related to problematic media use (Nelson et al., 2016), these indi- viduals may be drawn to passively browsing more maladaptive content, which future research should explore in greater detail.

Additionally, the effects of passive use on social adjustment may be contingent on other individual differ- ences. One personality trait that has received increasing attention in relation to young people’s digital technology use is the fear of missing out (FoMO). FoMO is the “pervasive apprehension that others might be having rewarding experiences from which one is absent” (Przybylski et al., 2013, p. 1841). FoMO may be related to a high approach motivation, such that young people who report high levels of FoMO may feel a strong need to interact and be validated by others. Thus, those with higher FoMO may be motivated to frequently check or use SNSs to feel connected to others. Further, using SNSs may exacerbate feelings of FoMO, as monitoring peers’ activities may trigger feelings of exclusion and rejection. FoMO has been linked to greater SNS use (Baker et al., 2016; Przybylski et al., 2013) and poorer well‐being (Baker et al., 2016; Elhai et al., 2018).

In contrast, young people who report lower levels of FoMO may do so for two reasons: a) they have many online and offline social connections and feel secure in their social competence, and b) they do not have or want many social interactions online or offline. The first group may be characterized by individuals who are highly extraverted and gregarious. The second group may be characterized by those with a greater preference for solitude, such as those higher in unsociability and social avoidance. Importantly, social avoid- ance is characterized by poorer adjustment and social relationships, whereas unsociability is typically

described as a more benign form of social withdrawal (Bowker et al., 2017; Bowker & Raja, 2011; Nelson, 2013). With this distinction in mind, empirical tests are needed to determine if these two dimen- sions vary in their relation to FoMO.

Those who are higher in FoMO may be more sensitive to others’ self‐presentations, especially to the positive self‐presentations on SNSs. In support of this, we found that browsing others’ Instagram content decreases self‐esteem and positive self‐perceptions, and increases interpersonal negativity, primarily for those higher in FoMO (Burnell et al., 2020). An important direction for future research is to parse out the potentially heteroge- neous group of young people lower in FoMO, as those who are lower in FoMO because of high social compe- tence, compared to those who are lower in FoMO because of a preference for solitude, may uniquely differ in their digital technology experiences.

### Social Exclusion

Digital technologies transform how social exclusion is experienced, as online platforms can alert young people when they were excluded from an event (e.g., viewing a posting of a social gathering to which one was not invited; Underwood & Ehrenreich, 2017). Social exclusion or rejection can threaten individuals’ sense of belonging. When individuals are not invited to or are purposefully excluded from social activities, their well‐ being can be affected, including heightened physiological stress responses (Masten et al., 2009) and higher nega- tive emotional reactions (Blackhart et al., 2009). Young people higher in social withdrawal experience greater exclusion and victimization in offline settings (Rubin et al., 2018), and, according to co‐construction theory, these experiences are also likely to occur online.

Feelings of social exclusion triggered by online content may emerge either due to deliberate efforts to reject the individual or nondeliberate, perceived exclusion. For instance, an individual may have been told not to attend a social event (deliberate exclusion), compared to less deliberate forms of exclusion, such as simply not being invited or not being able to attend (but still being subject to evidence of the gathering via digital technologies). Deliberate exclusion may resemble cybervictimization (described in more detail below) in its antecedents and consequences. Nondeliberate exclusion may be more ambiguous in intent and interpretation may vary greatly. In respect to social withdrawal, those higher in shyness may be especially susceptible to feel- ing excluded when viewing portrayals of social gatherings via digital technology, due to their higher levels of approach motivation. In contrast, those higher in unsociability and social avoidance, may have less adverse reactions.

After instances of social exclusion, people often respond by trying to regain their sense of belonging and social acceptance (DeWall & Richman, 2011). Reconnecting or seeking support from others are adaptive responses that can mitigate feelings of social exclusion and digital technologies allow for easy, immediate access to social support networks, although emotional rewards after receiving emotional support via text messaging may be attenuated compared to receiving emotional support face‐to‐face (Holtzman et al., 2017). Additionally, young people with smaller support networks may not be able to harness digital technologies to receive support as readily after rejection compared to those with larger networks. One experimental study of young adults and adolescents examined whether feelings of social exclusion could be mitigated by digital connection with others (Gross, 2009). In an experiment that induced feelings of exclusion using Cyberball (Williams & Jarvis, 2006), participants who engaged in digital communication after exclusion recovered to their baseline levels of self‐esteem and affect faster than those that played on the computer alone. In another experimental study, access to a mobile phone appeared to aid in recovery from social exclusion (Hunter et al., 2018). After a social stressor, participants with access to their phones reported lower feelings of exclusion, compared to those with no phone access. Further, individuals who had their phones but were restricted from using them showed an increased physiological stress response during their recovery. Thus, mobile devices and access to friends and family may help in response to social exclusion. However, young people higher in social withdrawal may have fewer friends to reach out to (Maner

et al., 2007), and may be less able to rely on a social network to recover from adverse feelings from exclu- sion, particularly if their close friends were involved with the exclusion.

### Cybervictimization

Digital technologies also transform how young people experience victimization, with online platforms provid- ing a new avenue through which bullying can occur. Cybervictimization refers to being the victim of cyberbul- lying, often defined as “any behavior performed through electronic or digital media by individuals or groups that repeatedly communicates hostile or aggressive messages intended to inflict harm or discomfort on others” (Tokunaga, 2010, p. 278). Cybervictimization includes behaviors such as being sent mean messages, being the subject of mean wall postings or a website making fun of an individual, or having unflattering or inappropriate pictures of oneself shared online (Craig et al., 2020). Even one experience of victimization can be extremely painful and cause distress over time (Underwood & Ehrenreich, 2017), perhaps especially for young people who spend time alone, because they may not have easy access to the type of peer support that might ameliorate the distress (McLoughlin et al, 2018). Overall, cybervictimization is associated with a range of negative outcomes: depression, low self‐esteem, anxiety, poor academic achievement, somatic symptoms, stress, and suicidal idea- tion, among others (Kowalski et al., 2014). Some evidence suggests that cybervictimization is linked to greater shyness (Garaigordobil, 2017), but research examining the relations between the different dimensions of social withdrawal and cybervictimization is generally lacking, particularly in terms of unsociability and social avoid- ance. Several possibilities for how these may relate to cybervictimization exist.

In line with co‐construction theory, young people’s social struggles offline also occur online. As noted earlier, young people higher in social avoidance tend to demonstrate poorer adjustment and have poorer relationships, whereas those higher in unsociability fare better (Bowker et al., 2017; Bowker & Raja, 2011; Nelson, 2013). Thus, those higher in social avoidance may be at risk for maladaptive peer relations to spillover in the online world, which may manifest in greater victimization experiences. For example, social avoidance predicts greater aggressive behavior (Bowker et al., 2017), which may transcend into online spheres. Given the strong overlap between cyberbullying and victimization (Meter & Bauman, 2015), it is possible that socially avoidant young people may also experience greater victimization.

Co‐construction theory would also suggest that, due to their preference of solitude, those higher in unsocia- bility and social avoidance may not be heavily engaged in digital technology, at least with technology that facili- tates social connection. If young people who prefer solitude are not as involved online, then their risk for cybervictimization may be lower. Engagement with SNSs was positively related to cybervictimization for a sample of young adolescents in 42 countries, especially problematic SNS use (involving preoccupation and addiction, Craig et al., 2020). Similarly, being engaged with a higher number of SNSs for a sample of US 8–13‐year‐olds was associated with more involvement in cyberbullying (Meter & Bauman, 2015). Importantly, these possibilities are not necessarily mutually exclusive. For example, socially avoidant young people may use socially connective digital technology less frequently (Nelson et al., 2016), but when they do use it, they may experience social difficulties such as victimization.

Additionally, young people with a greater preference for solitude could be at greater risk for cybervictimiza- tion as they may not have as many opportunities for support from peers (Coplan et al., 2015). Cybervictimization was found to be negatively related to support from peers for adolescents in Spain (González‐Cabrera et al., 2018), suggesting that peer support may protect youth from cybervictimization. Australian youth who were more socially connected were less likely to experience stress, anxiety, and depression as a result of cybervictimization (McLoughlin et al., 2018). Additionally, there is some evidence that cybervictimization is linked to indices of poorer social adjustment. One large meta‐analysis found that cybervictimization predicts loneliness (Kowalski et al., 2014). However, some studies do not find that loneliness predicts cybervictimization (e.g., Brewer & Kerslake, 2015). Also, for early adolescents in the United Kingdom, correlations between cybervictimization and social anxiety have been found to be modest (*r* = 0.11 to 0.27, Van Zalk & Van Zalk, 2019).

### Future Directions and Conclusions

Digital technologies are changing young people’s social experiences, for better and for worse. Despite the wealth of research that has been conducted on young people’s digital technology use, there is still much to be learned. First, research examining the links between solitude and social withdrawal with digital technology use is sorely lacking, particularly regarding unsociability and social avoidance. Future research should examine how individuals higher in these dimensions use media, and what consequences this may have. For example, those higher in a desire for aloneness report that mobile tablets are effective in reducing stress (Leung, 2015). Those higher in social avoidance use media in more problematic ways and less adaptive ways (i.e., for social connec- tion), with problematic media use in turn linked to greater externalizing problems (Nelson et al., 2016). Unsociability is linked to greater creativity (Bowker et al., 2017), and therefore these individuals may be drawn to creative content production on SNSs or to platforms that facilitate artistic expression (e.g., Pinterest, YouTube). The interplay between different dimensions of social withdrawal, type of media use, and adjust- ment could also vary by age. For instance, unsociability may be more maladaptive during early adolescence and more benign during late adolescence and emerging adulthood (Coplan et al., 2019). Thus, developmental approaches to media use and social withdrawal are needed.

Second, it is important to examine how types of digital technology use relate to alone time. Spending time alone is an important component of adolescence and can serve as a time of self‐reflection (Galanaki, 2013). Some evidence suggests that smartphone use (Diefenbach & Borrmann, 2019) and SNS use (Wang et al., 2012) occur during times of solitude, but it is unclear how the use of digital technologies that facilitate social connec- tion may transform how alone time is experienced, as the constant opportunity to socially connect may not encapsulate the ability of being truly alone. One study found that emerging adults with a preference for being alone were equally happy when using devices during alone time compared to not using devices (i.e., being “truly alone”), whereas emerging adults with a preference of being with others were happier when using devices during alone time compared to being truly alone (Thomas et al., 2020). Thus, key dispositional charac- teristics may moderate how device use during alone time relates to psychosocial adjustment, although more research is needed.

Third, given the transactional nature of many types of digital technology use, more work is needed that explores the situational circumstances that enhance and detract from young people’s social adjustment. For example, active public use may only relate to enhanced social adjustment when positive feedback is received (e.g., Burrow & Rainone, 2017), which may have particularly important implications for younger adolescents, who may have a heightened sensitivity to peer feedback received over digital platforms (Nesi et al., 2018a, 2018b). Additionally, more research, particularly longitudinal work, is needed to examine whether a preference for time alone protects from or leads to cybervictimization, or to whether the experience of cybervictimization might lead young people to withdraw or prefer time alone.

In sum, digital technologies can have varying effects on young people’s social adjustment, depending on *who* is using these technologies and *what* they are doing. Dispositional and situational characteristics can influence whether and when these technologies displace, reflect, or transform young people’s peer experiences. By focusing on these characteristics, we can enhance our understanding of when, why, and how digital technologies can be helpful and harmful, the knowledge of which can be used to scaffold young people’s successful development.

Alone Versus Together: Finding the Right Balance for Creativity

It is interesting today to be in the midst of a “sea” of literature expounding the benefits and importance of collaboration (for reviews see Paulus & Nijstad, 2019; Reiter‐Palmon, 2018). A special issue of the *American Psychologist* was dedicated to various papers discussing different aspects of teamwork (McDaniel & Salas, 2018). The conclusion derived by any visitor from outer space coming to our planet today would be that collaboration is necessary for accomplishing today’s goals and to make creative advances. If this visitor had come to this planet only 30 years earlier, they would have found an entirely different scene. There was still much focus on individual creativity and lone geniuses (Amabile, 1983; Runco & Albert, 2010; Sternberg, 1988; 2006). The clas- sic volume by Amabile (1983) on social factors in creativity focused mostly on the social reward context and noted the general paucity of evidence for collaborative creativity. Which of these pictures is the most accurate representation of the reality of the relative importance of individual versus collective efforts in the various domains like science, the arts, engineering, and organizations? In the popular press there has been some debate about these issues, and some have argued that collaboration is overdone, inhibits organizational effectiveness, and that isolation is important for deeper thinking, especially for those who are inclined to solitary reflection (e.g., Schumpeter, 2016). What will a visitor from outer space find 50 years from now? We hope they will find a balanced perspective based on a solid empirical and theoretical basis.

Our basic proposal is that in most cases there needs to be a balance between solitude and collaboration. The exact balance will depend on the people involved, the type of activity, and the phase of the activity. In this chapter, we will summarize the literature on the importance of solitary efforts and collaboration in creativity and suggest implications for practice in applying balancing solitary and collaborative efforts in the creative process.

Solitude and Creativity

Many significant creative contributions have involved a high degree of solitude. In some artistic areas most contributions are based on solitary efforts. The areas where solitary efforts dominate are typically ones in which the person has the requisite skills, a clear creative focus, and strong motivation to make a creative con- tribution. Individuals in these domains often explicitly seek solitude to accomplish their goals. Having long periods of solitary time allows them to build on their flow of ideas without interruption. There is much fascina- tion in our culture with “lone geniuses” who have attained great eminence in their domains. These individuals tend to have some characteristics in common such as broad interests, intellectual fluency, flexibility, and inde- pendence (Simonton, 1988), but one of the key factors in many cases is simple hard work, persistence, and a resultant high quantity of creative products (Ochse, 1990; Simonton, 2004).

Although the theoretical bases for the benefits of solitude are often not presented, it is typically presumed that geniuses or highly creative people need private time to fully develop their ideas and products (Ochse, 1990; Simonton, 2004). Since these people tend to be highly motivated and persistent, they are likely to be highly effective in using their solitary time. Indeed, a major impediment often cited by these geniuses is the negative impact of social distractions on the creative process. For example, when individuals are experiencing a creative flow of ideas, social interruptions can interrupt this flow and make it difficult to recapture the exact train of ideas (Csikszentmihalyi, 1996). This of course can apply to all creative activities regardless of the individual’s creative abilities. Ochse (1990) noted that solitude is necessary to develop the depth of knowledge required for creative efforts and to develop novel combinations, and the isolation may in turn be related to a relatively low level of development of social skills. However, the tendency to isolation could also simply be related to the habit of working alone. Ochse cites many examples of the importance of extended periods of undisturbed isolation as being critical for creative achievements. Darwin, Edison, Freud, and Einstein are but a few examples of those who demanded such periods of isolation and often expressed the opinion that creativity is primarily an individualistic process of the solitary mind (Ochse, 1990).

Other scholars have made similar observations about the importance of solitary creative efforts (e.g., Simonton, 1988, 1999; Sternberg, 1988). There is some empirical evidence that a preference for solitude is related to emotional creativity (Long et al., 2003). Schilling (2017) has highlighted the importance of separate- ness for serial breakthrough innovation – major innovations that are produced by the same person. She notes that some of the top people who fit that category, such as Einstein, Edison, Curie, and Jobs, were characterized by a degree of isolation growing up, nonconformity, and a strong preference for times of solitary reflection. In a similar vein, Csikszentmihalyi (1996) noted that the development of creative talents in adolescents was inhib- ited for those who were not able to tolerate solitude.

Two cognitive processes that appear to be important in solitary creativity are mind‐wandering and mindful- ness (Agnoli et al., 2018). Mindfulness involves intensive task focus and the minimization of distracting ele- ments and has been shown to be important for effective performance for many tasks (Mrazek et al., 2013; see also Leavitt et al., Chapter 24). In contrast, mind‐wandering occurs when one’s attention shifts from the pre- sent context to an unrelated one. The tendency toward mind‐wandering has been shown to have negative effects on many cognitive tasks, but it may be useful for the creative process (Agnoli et al., 2018). This has been highlighted as one benefit of the *incubation* process in which new ideas about an issue occur some period of time after one has been focusing on a particular problem. This incubation phenomenon has been noted by many students of highly eminent and creative people (e.g., Csikszentmihalyi, 1996; Gable et al., 2019). The benefits of incubation have also been shown on a variety of creativity tasks (Smith, 2003; Paulus et al., 2006). That is, brief breaks in the creative process that allow for a change in task focus have been shown to allow individuals to overcome cognitive fixation and to tap the cognitive associations related to one’s prior ideation.

Social Influences on Creativity

Our review thus far suggests that solitude can play an important role in facilitating creative efforts. However, few creative efforts occur in total intellectual isolation. Artists are influenced by past trends and by the efforts of their contemporaries in developing their creative contributions. In scholarly domains, most scholarship builds on prior contributions. People appear to have a strong tendency to compare their performance with others (Festinger, 1954). This is very evident in competitive sports but also in intellectual efforts. According to social comparison theory, people tend to compare themselves primarily to others who are similar to them along task‐relevant dimensions (e.g., similar in skill level in a particular sport or intellectual activity). However, there also seems to be a tendency to compare upward in the hope that one can possibly meet or exceed the performance of the object of one’s comparison (upward comparison, Festinger, 1954). However, if one is not very confident in one’s abilities, one may compare with individuals who are likely to be inferior in order to protect one’s self‐esteem (downward comparison). In a similar vein, if one faces inevitable com- parison with highly successful individuals (e.g., siblings or parents) one may focus on success in different

domains (Tesser, 1980). Those who have a competitive orientation may be motivated to work hard to exceed the performance of their contemporaries. This type of competitive spirit is often evident in academic and artistic domains. In sum, social interactions are important in the process of social comparisons because they can provide a motivational basis for creative efforts. Being around others may also be related to being hap- pier (see Zelenski et al., Chapter 22), and the related positive affect may facilitate divergent creativity (Baas et al., 2013). However, negative emotions related to the experience of loneliness during solitary periods can also facilitate creativity by increasing persistence in developing creative solutions (Baas et al., 2013).

Social contexts can also have negative consequences. Exposure to the ideas of others before one has a chance to carry out one’s own cognitive explorations may limit one’s creativity. The famous biomedical scientist Steve Brodie, who began a dynasty of award‐winning researchers at Johns Hopkins University, relished being fairly ignorant of the literature in particular areas since he felt that too much exposure and knowledge might inhibit his ability to consider novel approaches in this area (Kanigal, 1993). In group contexts there may also be pres- sure to conform to the ideas of others (Goncalo & Duguid, 2012), especially if social acceptance is highly val- ued. Concerns about negative reactions to one’s ideas may also inhibit one’s creative efforts in groups (Diehl & Stroebe, 1987), especially for those who are high in social interaction anxiety (Camacho & Paulus, 1995). In sum, social interactions may negatively impact creativity because of social and cognitive conformity, evaluation apprehension, and social interaction anxiety.

Group Creativity

Although groups may be unstable and challenging for effective creative processes, many creative activities occur in group settings. There is an extensive literature on team innovation that emphasizes the importance of their role in organizations (Reiter‐Palmon, 2018), and there is an increasing emphasis on the use of cross‐disci- plinary teams to solve problems or make new discoveries. Many problems require the input of people with different skills or knowledge. In both academic and work contexts, there has been much focus on the need for interdisciplinary teams (Derry et al., 2005). Groups are needed for creativity tasks that require multiple areas of expertise, as is reflected in the trend for multidisciplinary research to address increasingly complex questions that require input from different domains. However, collaborations with others can be useful for any type of issue since ideas from others can increase the breadth and depth of one’s thinking about an issue or topic (cf., Deuja et al., 2014). The problem is not whether we should seek out others for creative collaboration. The issue is when to seek such collaborations and how to structure the collaboration in terms of timing and the interac- tion process so as to maximize the efficiency of the process and optimize the quality of outputs or products.

There is considerable empirical evidence to suggest that social interactions play an important role in major achievements. However, the motivation for involvement in social interaction is likely to vary as a function of the overall creative ability of the individual. High creatives may be primarily driven by internal motives (intrinsic motivation; Amabile, 1983, 1996), whereas low creatives may need strong external moti- vation to engage in creative efforts. Even though highly creative people may have a strong internal motiva- tion, the role of mentors and peers is also evident for many (Hooker et al., 2003). For example, the Vienna Circle, a group of philosophers and scientists who met regularly in the early part of the twentieth century, provided much intellectual stimulation and feedback to one another, and the impressionists benefited from their social connections in France (Farrell, 2001). Kurt Gödel, who is considered one of the greatest math- ematicians of the modern era, did all of his work alone but sought out opportunities to share his ideas with colleagues in the Vienna Circle and with his good friend Albert Einstein. This typically led to encourage- ment to increase his efforts to publish his work. However, his lonely lifestyle and related psychological issues appeared to contribute to a relatively low publication rate (Goldstein, 2005). Dunbar’s (1997) obser- vations of biomedical research teams suggested that the presence of a newcomer who could ask unique questions was important for teams that came up with the most significant findings. Taken together, it seems clear that even highly creative people can derive considerable benefits from their intellectual interac- tions with others.

Although interactions with others can play an important role in creativity, working with another person who nicely complements one’s expertise and interests can be especially beneficial for enhancing creative problem solving (Glăveanu et al., 2019). There are also many cases in which great creative careers were based on strong and consistent collaborations between two individuals ( John‐Steiner, 2000; Kanigal, 1993). These individuals often complemented each other intellectually and motivationally. Many high‐tech companies have been started by two entrepreneurs who complement each other. There is not a similar hype about great triplets or tetrads. Those configurations may involve status conflicts and interactional difficulties as evidenced in the frequent breakups of highly creative groups (Bennis & Biederman, 1997) and of high‐profile musical groups such as the Beatles. The simplicity of the interactional dynamics in dyads may be in part related to their creative success and persistence. For example, even though the impressionists in France had a broad range of interaction with one another, most of the intense interactions involved pairs such as van Gogh and Gauguin (Farrell, 2001). Similarly, research on dormitory life has found that for dorm rooms with three residents it is likely that there will be a breakup, with one of the residents becoming an isolate or leaving the residence (Baum et al., 1979).

Group Creative Processes

Generation of creative ideas in groups involves effective tapping of one’s knowledge base and the development of novel combinations relevant to a particular problem. For high levels of creativity, an intense cognitive search process requires a context with few distractions, in which a person can follow his or her trains of thought and build on the various ideas that come to mind (Paulus & Brown, 2007; Nijstad & Stroebe, 2006). Typically, the most obvious ideas come to mind first, so it is important to persist in this process long enough to allow less accessible ideas to come to the fore. Research does indicate that more novel ideas tend to come in the later stages of the ideation process (Baruah & Paulus, 2016). However, at some point the pace of new ideas will slow down, and it becomes more difficult to come up with new ideas or combinations. There may also be a tendency to become fixated on a certain topic or domain. At that point, we suggest that it may be useful to take a break from the creative process and let the mind wander. Studies have found that brief breaks tend to have a rejuve- nating impact and can increase the number of ideas generated (Paulus et al., 2006). However, when one feels at a loss for generating more ideas, the input of others may open up new avenues of cognitive exploration. Exposure to the ideas from others can serve to “prime” different cognitive domains that had not been consid- ered (Dugosh et al., 2000) and allow a person to build on those ideas (Kohn et al., 2011).

Notwithstanding, it may also be important not to tap others’ ideas too early in the process. Exposure to ideas from others before one fully taps one’s own knowledge base may limit the subsequent search process. One may become fixated on the categories or domains represented by the shared ideas and this may limit the diversity and depth of the search process. Furthermore, unless there is a strong motivation to fully tap the relevant knowledge domains for an optimal solution, there is often a tendency to go with the first reasonable idea, short‐circuiting the creative exploration process (Paulus et al., 2002). In sum, both solitary reflection and group interaction can be beneficial for creativity, but for optimal creative outcomes it may be best for some solitary reflection to precede the social interaction.

Types of Group Creativity Paradigms

Whether groups tap their creative potential depends in large part on the way they interact with each other. Face‐to‐face interactional settings in which ideas are shared verbally are most common, often enjoyed and per- ceived as productive (Paulus et al., 1993). However, the evidence is clear that this setting is not related to a high level of creative productivity (Diehl & Stroebe, 1987). In such group settings only one person can effectively share at one time, limiting the sharing opportunities. Although one could compensate by having a longer session, groups typically “run out of steam” or come to a creative consensus in a fairly short period of time in unstructured settings. Therefore, face‐to‐face verbal interaction is typically not an effective way to tap the crea- tive potential of a group.

An alternative is to allow groups to exchange ideas electronically. This allows all group members to share ideas at the same time and to examine the shared ideas at any point. Ideally group members generate their top‐of‐the‐head ideas first before looking at the ideas of others. This would avoid the problem of prema- ture fixation and allows for stimulation of additional ideas or domains of ideas. This approach seems to be more effective than the face‐to‐face one in the generation of a large number of ideas (DeRosa et al., 2007). Typically, when a large number of ideas are generated the number of highly novel ideas also increases (e.g., novel and useful or feasible; Paulus et al., 2011). One drawback of this approach is that it requires some degree of organization to obtain a summary of the ideas and to go through a collaborative evaluation pro- cess. Also, the added creative benefit of group interaction using electronic platforms is often only minimal compared to the pooled performance of individuals. The benefit is increased slightly as group size increases, apparently due to cognitive stimulation of the increased number of ideas (Paulus et al., 2013). Part of the reason for the comparatively modest benefit may be the fact that there is typically no procedure that ensures attention to the shared ideas, a critical factor in enhancing the cognitive stimulation benefit of shared ideas (Paulus & Brown, 2007).

Another potentially useful approach for enhancing the number of ideas shared is for group members to exchange their ideas in writing by passing slips of paper containing ideas among the group as they are gener- ated. This approach has been termed brainwriting and can be done in a variety of ways (Heslin, 2009; Paulus et al., 2015; Paulus & Yang, 2000). One version is to have group members place their ideas in the middle of the table as they are generated and then draw from the pile when they wish to see what others have generated. By using different colors of paper, group members are able to determine which ideas belong to others. Another approach involves group members passing slips in a round‐robin fashion as they are generated. These slips can be read, elaborated, and passed on to the next person. Although this approach assures attention to the shared ideas, it may interrupt the semantic flow of the individual group members. These approaches lead to much higher rates of idea generation than the face‐to‐face version, but additional research is needed to determine the conditions under which each procedure may be optimal (Heslin, 2009).

Solitary intellectual creativity typically involves writing down one’s ideas. Some suggest that the writing modality in itself may facilitate the processing of creative ideas (Ten Houten, 2011). In social contexts the exchange process is typically verbal unless there is some degree of structure for written or computer‐based exchanges of ideas. Verbal interactions may be less efficient since they involve the need for alternation and the distracting effects of the various social cues. It may be difficult in that context to get a consistent cognitive flow of ideas that allows one to effectively tap one’s cognitive resources. We presume that the optimum approach to social creativity may involve the initial exchange of ideas by writing such that one can experience one’s flow of ideas while periodically tapping ideas by others when one comes to a cognitive “dry spell” (Paulus & Kenworthy, 2019). After a broad number and range of ideas have been generated, their evaluation and further development can occur in a face‐to‐face setting.

Hybrid Creativity

Although both solitary and collaborative creative efforts are important for attaining innovative outcomes, an issue that has seen little exploration is the role of *balance* between those efforts (Brown & Paulus, 2002; Korde & Paulus, 2017). Although some creative efforts can be accomplished quite well individually, and others require collaborative efforts, in many cases a combination of solitary and collaborative efforts is required or at least beneficial. For example, members of a creative collaboration may each focus on developing creative inputs in their specific domain of expertise in isolation. Subsequently, the team can meet to discuss their solitary efforts and articulate ways to integrate them into an innovative project. This can happen as part of a short‐term prob- lem‐solving session or a long‐term academic or technical collaboration.

No matter what procedure is used, it may be useful to alternate group ideation with individual ideation (Korde & Paulus, 2017). In real‐world contexts there is frequent alternation between those modalities. If one has spent some time thinking about an issue but has run out of new ideas, involvement in a mutual idea‐ sharing process can open up new intellectual avenues. Similarly, if one has been in a group setting, many

associations that may have been stimulated by the exchange may not be fully exploited because of the task demands of generating and processing the shared ideas. Thus, a solitary ideation session following a group session allows individuals to harvest the benefits of these associations before they decay (Brown & Paulus, 2002). Research has supported the benefit of this sequence and demonstrated elevations in creative idea generation in solitary sessions that follow immediately from group sessions (Korde & Paulus, 2017). In short, reflection times after a period of collective ideation may allow for more effective tapping of the result- ant cognitive stimulation and enable a person to build on the various shared ideas.

Some people naturally gravitate to groups; others prefer solitary sessions (Coursey et al., 2018). Yet all need to mix their contexts at some point for an optimal outcome. The social interactions should be fol- lowed by solitary reflections. The solitary sessions should be followed by sharing ideas with others and getting feedback. Creativity involves building on knowledge – all knowledge is social (comes from others) and studies have shown that groups may be particularly well‐suited for building on previously generated ideas (Kohn et al., 2011). Even in solitary sessions much work may involve reading work by others and building on them.

Diversity

Many innovations require the effective integration of different types of knowledge and expertise. There is research that has demonstrated the potential utility of diverse workgroups for creative outcomes both in controlled laboratory and work settings (Paulus et al., 2019). Although the benefits of such collaborations would seem fairly obvious, effective interdisciplinary work is challenging given the knowledge gaps that may exist in the groups that inhibit the ability for mutual comprehension (Cronin & Weingart, 2007). Disciplinary and demographic differences may also inhibit the free exchange of ideas (Bell et al., 2011). Increased experience as a group, as well as a positive attitude to diversity, appear to increase the likelihood of positive outcomes in diverse groups (Cummings & Kiesler, 2008; Nakui et al., 2011). Groups with these characteristics may be more comfortable exchanging ideas and more receptive to new ideas. As a result, they may be more prone to attend to the shared ideas of one another and to elaborate on them. Both the sharing and elaboration processes are important for enhancing creativity in groups (Coursey et al., 2018; van Knippenberg & Schippers, 2007).

Another type of diversity involves differences in ability within the group. When some group members stand out in their creative efforts, will this motivate other group members to increase their efforts or will they be intimidated and reduce their efforts? It appears that highly creative people can play an important role in enhanc- ing the creativity of others as mentors or by the stimulating impact of their ideas in group interactions. There is considerable evidence that students of Nobel Prize winners have a high probability of creative success. Although this could be due in part to the Nobelist’s ability to attract very bright and creative students, it may also reflect the stimulating impact of working with such creative individuals (Zuckerman, 1996). Thus, it is important for highly creative people to be involved in group contexts such as classrooms, laboratories, and vari- ous collectives to help stimulate additional creativity in such contexts.

We have recently obtained evidence in support of the positive impact of highly creative individuals on the other members of the group (Kenworthy et al., in press). In this study participants generated ideas in four short sessions in dyads. Subsequently they participated in two brainstorming sessions in groups of four. The composition of the four‐person groups was mixed between the two group sessions, such that one of the groups contained the top performer from across the previous dyad sessions and the other did not. We assessed the top performer in terms of both the highest number of ideas generated as well as the highest average novelty of ideas produced. When the top performer was present in a group – whether we examined the top *number* performer or the top *novelty* performer – the performance of the rest of the group was elevated in terms of the number of ideas. Furthermore, the bigger the discrepancy between this person and the rest of the group in terms of prior performance, the stronger the positive effect of the top performer on others. These findings suggest that highly creative individuals can have a beneficial influence on the creative outputs of those around them.

Moderators

In our discussion of the various issues related to the inter‐related roles of solitude and social interaction in crea- tivity, we have noted a number of factors that are likely to moderate their relative importance. We will discuss some of these in more detail.

*Individual differences.* There are significant individual differences in creative abilities (Taggar, 2002, 2019). Differences in creativity are also influenced by differences in personality. Those who are high in openness to experience and extraversion tend to be more successful on creativity tasks, possibly because they may feel freer in expressing their ideas (Coursey et al., 2018; Feist, 1998, 2019; Long & Averill, 2003). However, others have noted that many highly creative people show a preference for solitude and have some degree of introversion (Bowker et al., 2019; Simonton, 1999). Creative people are typically not highly sociable, but they tend to be high in self‐efficacy and assertiveness (Bandura, 2000; Feist, 2010; Tierney & Farmer, 2002). Many introverts may be inclined to isolation in part due to their lack of perceived efficacy in social domains or their underestimation of the emotional benefits of social interaction (Zelenski et al. 2013; Chapter 22). Since creativity involves generating products that will undergo social evaluation, these individuals may not be particularly prone to sharing creative ideas or products.

In Csikszentmihalyi’s (1996) writing about his interviews with creative individuals he highlights the need for some type of balance or mix of introversion/extraversion traits. In some phases of the creative process, such as writing or building on thoughts that have arisen from a survey of recent literature, it is important to have a period of solitude to fully develop one’s ideas or follow particular trains of thought. However, it is also impor- tant to bounce one’s ideas off of others and to seek their feedback. Those whom Csikszentmihalyi interviewed strongly emphasized the importance of social connections and interactions in the creative process.

It has also been found that introversion is related to intellectual curiosity or a general interest in learning (Ackerman & Rolf hus, 1999). This is obviously beneficial for creative efforts and may require periods of isolation. Although introversion may be related to a general preference for solitude (Burger, 1995), it also may simply reflect a functional choice and may be unrelated to actual efficacy in social settings (see Zelenski et al., Chapter 22).

*Type of task.* Success on some creative tasks may be quite feasible with solitary efforts but success on others requires intense collaborations (Bennis & Biederman, 1997). Across the domains of world cultural art, including symphonic music, painting, sculpture, and literature, the vast majority of recognized work and masterpieces have been produced by individuals. It is of course possible to have collaborations for such efforts and some do exist. For example, there is a literary movement called *collaborative fiction*, which involves the teaming of several individuals to produce works of literature. In some places, such as Italy and Australia, such efforts are taken seriously and might be considered a tradition rather than a fad or a brief movement. Japan also has a tradition of *Renga*, which is a genre of collaborative poetry.

Notwithstanding, highly creative efforts in these domains seem to demand primarily persistent effort by one person to follow their creative inclinations, and many of the top people are very prolific (Simonton, 1999). These efforts reflect highly motivated and creative individuals whose output does not require explicit collabora- tion. However, they are likely still influenced by the social context and their peers, and the reaction of the audi- ences to their work in the approach or style of their creative process (Amabile, 1983; Farrell, 2001). Moreover, other artistic efforts, such as musical compositions, plays, and sometimes novels, often involve two or more collaborators. For example, Disney’s widely acclaimed 2013 film *Frozen* featured ten original songs co‐com- posed by Kirsten Anderson‐Lopez and Robert Lopez. In 2017, the two fiction writers Nicole Galland (historical fiction) and Neal Stephenson (speculative/science fiction) teamed up to produce a collaborative novel called *The Rise and Fall of D.O.D.O*., a futuristic/historical novel involving time travel.

For many other tasks there is no potential limit to the number that can be involved. For example, the use of crowdsourcing allows large numbers of people to contribute their ideas about an issue (including *wikinovels*; see wikinovel.net). The effects of group size depend on the nature of the interaction modality. In face‐to‐face

contexts, the larger the group the less potential for group members to gain the “floor” for sharing their ideas (Bouchard & Hare, 1970). In electronic formats there is not a limit, but there is likely a limit on the extent to which group members attend to the shared ideas. The brainwriting paradigm is probably best suited for small groups (cf., Paulus & Kenworthy, 2019). In sum, the type of task and the size of the group will jointly deter- mine the extent to which collaboration is required and beneficial.

*Phases of creativity.* The creative process typically goes through a series of cycles such as idea generation, evaluation, selection, and further elaboration (e.g., Wallas, 1926). Each of these can be done alone or in groups and there is no definitive research on the extent to which the different phases should be done either alone or in groups. There is a major gap in our understanding of the linkage between the quality of the ideation phase and the more convergent phase of selection and idea development (Paulus & Kenworthy, 2019). In group settings it appears that the ideas that receive the most elaboration during the idea exchange process are most likely to be incorporated into a final innovative product (Coursey et al., 2019). There may also be some value in completing the evaluation process in groups to get a broad range of pros and cons, facilitating the selection of ideas with the greatest potential. However, when there are a large number of ideas, some initial voting by individuals can allow groups to focus on the subset of ideas with the highest level of support.

Finding the Optimal Balance

It is clear from the literature that some variation between solitary and collaborative creativity is likely to be optimal. However, the right *balance* will depend on the problem, the domain, the task, and the person. Some people are naturally more comfortable with solitary ideation and are able to attain a high level of individual creativity. Those who score high on openness to experience, introversion, or need for cognition (Kearney et al., 2009) may function best with a predominance of individual creative effort. Those who are highly extraverted may need the stimulation of a group setting to motivate their creative efforts. Problems that have individual subcomponents that can benefit from the creative efforts of individuals with specific expertise, and individual ideation sessions that precede a subsequent collaborative session may be sensible. However, for complex mul- tifaceted problems, a group interaction process may be required to fully explore the many dimensions and stimulate creative thinking about potential options. In subsequent individual ideation sessions, group members can more deeply reflect on the shared perspectives and provide their unique elaborations.

In an ideal world, we would presume that people will naturally drift to the setting or social context that is required for a particular creative task. However, often there is a degree of optionality in this process. Some tasks can be accomplished alone, other tasks in pairs, and still others in groups. The key question is to what extent these different options are optimal for different people, different tasks, different task modalities, and different phases of the creative process. It will take some additional research to shed some light on that complex set of questions.

Summary Perspective

It is clear from the broader creativity literature that periodic solitude can be important for creativity. Furthermore, many creative products in the areas of the arts and literature have involved solitary efforts. However, group interaction can also be an important factor in the creative process. Individuals can gain useful stimulation from group interaction and groups can elaborate and build on the shared ideas to generate a product that would not be feasible for a solitary individual in domains that require diverse expertise. Social interaction can also have motivational benefits in terms of expression of support and the instigation of com- petitive motivation.

It is not feasible at this point to provide a precise recipe for the balance of solitude and social interaction for creativity. This will depend on the personal characteristics of the individuals involved, the type of task, and the phase of the creative process. Socially oriented individuals may more frequently seek out collabora- tive settings and may benefit more from social interactions. Tasks that require diverse expertise will obvi- ously require a high degree of social interaction. Collaborative interaction may be especially important in

the more convergent phases of the creative process when it is necessary to select the best ideas and develop them into feasible, useful and impactful products. The most successful individuals and groups will be those that are able to find the right balance at the right time. Unfortunately, there is no research on this issue to guide practice.

It is presumed that groups that have a long history and are highly successful will demonstrate some degree of facility in the appropriate balancing of solitary and group efforts (cf., Bennis & Biederman, 1997). The research on the half‐life of groups may be relevant here (Gersick & Hackman, 1990). Groups working on a task may not become fully engaged until about halfway through the time that has been allotted for their task. Creative groups may drift a bit and have a preponderance of solitary efforts until it is clear that it is necessary to work together to complete the task. At that point there will be an increase in collaborative interactions designed to meet the deadline. The senior author experienced this when he was part of a team that was given 48 hours to come up with a new design for a public housing project. In the first 24 hours most of the time was spent in gathering information and in solitary efforts. Once the team reached the halfway point, we realized that we would have to greatly increase our collaborative efforts. A new leader took over, and intense discussions led to division of focused efforts by various subgroups. At the end of our all‐night sessions we were able to present a coherent plan in the morning to the gathered news media. It is presumed that “great groups” or “super teams” will know “when to hold and when to fold” when it comes to the degree of collaboration and timing of collaboration as they work on various projects. The extent to which such collective skill develops naturally or can be learned or taught is an interesting question for future research.

### Solitude as a Means to Obtaining Mental Rest in Skilled Athlete Populations

The American football Quarterback Brett Favre reports that, as his career progressed, he found he did not enjoy life in the northern US cities in which he played.1 He describes taking any opportunity during this time to escape these cities, withdraw socially so that his only company was his immediate family, and, to use his word, “hide” at his home in Mississippi (NFL Network, n.d.). Although this account of Favre’s desire for reduced social interaction is anecdotal, as researchers of sport psychology, we have begun to uncover evi- dence that reduced social interaction and engagement in solitude help athletes achieve the mental rest they desire, with benefits for their sports performance and physical and mental well‐being. We report on this research in this chapter.

First, we outline our interests in obtaining a better understanding of the psychology of rest in athletes. We then discuss the concept of rest as it features within the extant sport psychology literature and we highlight how rest has received little *direct* attention within this research, placing limits on current theory, research, and practice in the field. Next, we describe a recent study (Eccles & Kazmier, 2019) in which we attempted to address this shortcoming by prioritizing an understanding of the psychology of rest in athletes. In particular, we outline how reduced social interaction and engagement in solitude allow athletes to obtain wakeful resting experiences that enhance feelings of being rested, with benefits for sport performance and well‐being. Next, we discuss how our study findings can inform our current understanding of athlete recovery, motor skill learning, and the development of expert sports performance. We then present implications of our research for theory and research on solitude. We conclude with considerations for future research in this area and with implica- tions of our research for the practice of sport psychology.

##### The Concept of Rest Within the Extant Sport Psychology Research Literature

Within the extant research literature within the discipline of sport psychology, the concept of *rest* has been invoked and discussed most in relation to the topics of athlete recovery, motor skill learning, and the develop- ment of expert sports performance. We now discuss these topic areas and highlight how rest has received little direct research attention within each area.

*Athlete recovery.* Recovering physically and mentally between training sessions and competitions, and between competitive seasons, is critical for athletes’ sport performance and health and well‐being (Kellman et al., 2018). As such, the research literature concerned with athlete recovery is extensive. Within this literature, rest is

typically associated with inactivity, which is considered as the reduction or cessation of physical training and competition (Eccles & Riley, 2014). In Kellman et al.’s (2018) consensus statement on athlete recovery, a section is included on definitions of central terms concerned with recovery. In this section, rest is defined as a method for achieving recovery, passive in nature compared to more active recovery methods (such as cool‐down jogging) and characterized by inactivity. Furthermore, inactivity is implicitly considered in this statement as physical inactivity (i.e., not mental inactivity). Given this definition of rest as physical inactivity, the principal function of rest within this literature is to aid the athlete’s recovery from physical and psychological fatigue following training and competition (Kellmann et al., 2018; Loch et al., 2019; Meeusen & De Pauw, 2018). Insufficient recovery can promote the onset of overtraining syndrome, where symptoms include fatigue, performance decline, and mood disturbances (Meeusen et al., 2013). Insufficient recovery can also lead to burnout, which is an experiential syndrome characterized by reduced accomplishment, emotional and physical exhaustion, and sport devaluation (Eklund & DeFreese, 2015). Rest is considered essential to the recovery process and thus to avoiding onset of the overtraining and burnout syndromes. In addition to its preventative role, rest is also proposed as the most effective therapy for these syndromes (Goodger & Kentta, 2010).

However, our understanding of the relations between rest and recovery is incomplete. A concern with defi- nitions of rest as physical inactivity is that ceasing physical activity does not guarantee a cessation of psycho- logical activity. Research has established that various sport‐related stressors lead athletes to experience anxiety not just during competitions but also outside of training and competition contexts during rest days. For exam- ple, in a case study by Roderick and Schumaker (2017), a retired professional soccer player reported that, during his career, he was always thinking about his performance, which made it difficult for him to “switch off ” when not training or competing. Little consideration has been given within sport psychology to conceptualizing rest as “psychological inactivity” and to understanding the relation between this form of rest and athlete recovery. Exceptions include recent studies of athletes’ ability to psychological detach, where psychological detachment is considered as a key recovery experience involving the cessation of thoughts about stressful aspects of sport when away from sporting contexts. For example, Balk et al. (2017) used a cross‐sectional survey design to explore the relation between psychological detachment, mental energy, and incidence of injury in recreational athletes. The results revealed that psychological detachment was positively related to mental energy and negatively related to incidence of injury. Despite these advances in an understanding of the role psychological detachment might play in the recovery process, little is known about how detach- ment actually occurs. Future research should be aimed at identifying personal and contextual factors that facilitate (and impede) detachment, and the psychological mechanisms underlying the detachment

process.

*Motor skill learning.* Bodily movement is an inherent feature of most sports. Consequently, researchers interested in understanding the basis for skilled sports performance have devoted much attention to investigating how athletes acquire, maintain, and refine motor skills. One specific aim within this research arena is to identify practice‐to‐rest ratios optimal for learning, particularly in relation to novel motor tasks and thus in the early stages of learning. A general finding is that distributed practice, which involves practice sessions separated by rest periods ranging in duration from seconds to days, results in better learning than massed practice, which involves little or no rest between practice sessions (Shea et al., 2000). Many studies of distributed practice have employed rest periods in the order of seconds, which are of limited relevance to the present review. However, a few studies have involved rest periods in the order of hours and days and their findings accord with the more general finding that distributed practice benefits learning. For example, Shea et al. (2000) studied the effects of distributing practice across days, compared to within days. In one experiment, participants practiced a novel continuous skiing‐like balance task in two sessions of seven trials each. For one group, the two sessions were separated by 20 minutes of rest, and, for another group, the rest period between sessions was 24 hours. To measure learning, a retention test was administered for both groups 24 hours after the second session. The results indicated that, compared to the 20‐minute rest period, the 24‐hour rest period resulted in enhanced learning (see also Paulus, Kenworthy, & Marusich, Chapter 19).

A key explanation for the beneficial effect of rest periods within distributed practice is that they allow for memory consolidation (Shea et al., 2000). Memory consolidation involves the neurobiological metamorphosis of memories from unstable states into a more permanent form, a process that lasts hours to days. New repetitions of the criterion task during this process disrupt the consolidation of the memory of the origi- nal repetition of that task, resulting in an impoverished memory. Therefore, separating two given practice ses- sions with a rest period, within which no new repetitions of the criterion task are made, allows for any memories created in the first session to be at least partly consolidated before the second session is undertaken.

Although research has provided evidence of the learning benefits of practice schedules that include rest breaks, important questions remain about how rest periods affect the learning process. Conceptualizations of rest within this research area are typically limited to not practicing. There have been few considerations of how different qualities of wakeful rest within distributed practice schedules affect motor learning. Insights into the effects of such qualities might be gleaned from a recent line of research on the effects of different post‐practice rest periods on the learning of cognitive tasks such as memorizing novel, nonsense words (e.g., Craig et al., 2018). The key findings of this research are that immediate post‐practice performance and longer‐term reten- tion are greater when practice is followed immediately by a wakeful rest period that is calm and quiet in nature than by an equal‐length period involving sensory stimulation. The leading explanation for this *quiescence effect* (Craig et al., 2018) is that sensory stimulation is disruptive to the processes involved in memory consolidation. This disruption results in a relatively impoverished memory structure, and thus the more quiescent the rest period, the better the learning. As such, future research should identify the extent to which the quiescence effect holds in the motor domain and pinpoint other qualities of wakeful rest within distributed practice sched- ules that enhance motor learning.

*Development of expert sports performance.* Whereas the field of motor learning has concerned itself primarily with the early stages of learning, other researchers within sport psychology have investigated the development of expert sports performance. Research in this area has been heavily influenced by the deliberate practice framework proposed by Ericsson et al. (1993), within which rest plays a central role (Baker & Young, 2014; Eccles, 2014). Ericsson et al. (1993) posited that “deliberate” practice is necessary to develop expertise in a given domain and can be differentiated from alternate practice types by its emphasis on enhancing current performance. Thus, such practice emphasizes performance enhancement, which typically involves identifying and improving currently weak areas of performance. Ericsson et al. (1993) also proposed a monotonic benefits assumption, which is that the amount of time an individual engages in deliberate practice is monotonically related to his or her acquired performance level. Consequently, experts have on average accumulated more time engaged in deliberate practice than their less‐skilled counterparts. Typically, experts have practiced for over a decade from childhood before reaching their performance level. Ericsson et al. (1993) also proposed an *effort constraint* on engaging in deliberate practice. Deliberate practice requires considerable effort, placing great demands on the attentional systems, and where movement is required, on the physical systems. To engage in daily deliberate practice over many years, individuals must avoid becoming exhausted from engaging in such practice, given its effortful nature. Daily deliberate practice must be limited to an amount from which individuals can completely recover. This amount of practice is considered to be ~4 hours per day and this total daily practice amount must be broken into multiple sessions limited to ~80 minutes each. The remainder of the individual’s time must be spent resting to enable full recovery prior to reengaging in deliberate practice.

Researchers have applied the deliberate practice framework to studies of sport, with most studies being aimed at testing the monotonic benefits assumption (Baker & Young, 2014) and identifying qualities of practice activities adopted by expert athletes (e.g., Eccles et al., 2009). By contrast, little research attention has been paid to the rest periods that necessarily accompany engagement in deliberate practice according to the theorized effort constraint. This shortcoming has been recognized recently, leading researchers (e.g., Baker & Young, 2014; Eccles, 2020) to call for research to address this gap in our understanding of the development of expert sports performance.

### Eccles and Kazmier’s (201t) Model of the Psychology of Rest in Athletes

As we have described in the sections above, some research within sport psychology has featured the concept of rest but, where it has, this concept has received little direct research attention. Instead, rest has been of periph- eral interest within this research, which accounts in part for our limited understanding of this concept. We recently attempted to address this shortcoming by conducting a study of how skilled athletes conceptualize rest (Eccles & Kazmier, 2019). This research resulted in the development of an initial model of the psychology of rest in athletes, within which reduced social interaction and engagement in solitude play important roles. We describe this study below. First, we briefly describe the interview method we used. We then set out key components of the model of rest generated from our interview data. Next, we present evidence from the inter- views that athletes often reduced their social interaction and engage in solitude during the rest days available within their typical training week. Finally, with reference to components of our model of rest, we outline how reduced social interaction and engagement in solitude help athletes obtain mental rest.

##### Study Method

Given the paucity of research in this arena, we avoided using the extant literature as a basis for exploring this topic and instead worked inductively from data to this end. Specifically, we generated a descriptive model of the psychology of rest in athletes via an inductive analysis of interviews with a high‐level field hockey squad at a UK university, comprising 18 female athletes and 4 male coaches. The interview guide used in the study was semi‐structured and involved open‐ended questions, beginning with “What does rest mean to you?”

##### Model of Rest Generated From Study Interviews

The model of the psychology of rest in athletes we generated involves multiple concepts. Central to the model is a distinction between a *state* of being or feeling rested and a *process* of resting that enhances this state. Reduced social interaction and engagement in solitude facilitate the process of resting and thus help enhance the extent to which an athlete feels rested. These concepts are described in more detail below. We selectively provide interview quotes to help bring these concepts to life.

*The state of being rested.* Athletes conceive of feeling rested as involving a physical aspect and a “mental” aspect, which they consider as largely independent. The primary focus within the model is on the mental aspect, which has several characteristics. Mentally rested athletes feel “fresh”; poorly rested athletes feel “tired.” Compared to their more poorly rested counterparts, mentally rested athletes value and appreciate their sport, and feel more motivated to engage in their sport and consequently apply more effort to it. Athletes enjoy their sport more when well rested than poorly rested, and also attribute poor health to being chronically poorly mentally and physically rested. Athletes find it is harder to increase their level of mental rest than physical rest, in part because stopping physical training is easier than stopping thinking about their sport.

*The process of resting.* An athlete’s level of mental rest is increased via engagement in a process of resting, which encompasses: (1) sleep; and (2) resting while awake. The primary focus within the model is on wakeful resting. Wakeful resting is achieved via key resting experiences. These experiences include: (1) a cessation of the mental demands of training and competitions; (2) a reduction in thinking about one’s sport; (3) a reduction in effortful thinking more generally; (4) increased internal control; (5) increased variety in activities, and social and physical environments; and (6) increased opportunities to engage in areas of life outside of sport. For five out of six of these resting experiences (i.e., experiences 2–6), attempts to obtain these experiences during the competitive season are facilitated by reduced social interaction and engagement in solitude (see Eccles & Kazmier, 2019, for details about how the off‐season provides different opportunities to obtain these resting experiences). Reduced social interaction involves the athlete spending time with a small number (typically one or two) of close friends,

in contrast to larger groups of people that include those less well‐known to the athlete. Solitude involves spending time alone. As such, we now focus on these five resting experiences.

Table 20.1 presents the experiences. The first table column presents personal and environmental contextual elements associated with being an athlete in a sport program. First, during the season, athletes are constantly engaged in sport‐related activities including program activities (e.g., training), program support activities (e.g., meal preparation), and social activities involving teammates and conversations about their sport. An athlete describes this concept of constant engagement in the following quote.

[Before university] I was only training once a week with a match on Saturday. The rest of the week I didn’t really think about hockey, but now. . .every day there’s something, and you’re always constantly in contact with the team on social media. . .it’s always there. I prefer it because you can really dig into performing and getting the most out of your hockey. It’s just a lot more intense than it has been previously. Athlete 5.

Second, the athlete’s sport is typically important to them: He or she is invested in their sport and embedded in a culture of high expectations and thus feels pressure to perform. Third, during the season, athletes must adhere to a fixed schedule of training sessions and competitions, and must respond to program directives con- cerning appropriate sleeping, eating, and socializing. Fourth, over the season, athletes spend much time follow- ing the same daily routines (e.g., training schedules) and in the same physical environments (e.g., training venues) and social environments (e.g., teammates) encapsulated by a coach as: “Same place, same time, all the time, all week.” Lastly, athletes’ sport commitments are typically time‐ and energy‐consuming, which means that athletes must often postpone or forego activities in other areas of life such as socializing with friends and family, hobbies, and other developmental opportunities.

These contextual aspects result in specific psychological experiences (Table 20.1, Column 2). First, constant engagement in sport‐related activities, alongside the importance placed on their sport, can lead the athlete to feel that they are always thinking about their sport.

One of my best friends is on the team and when we’re together we’ll be talking about whatever but it will always be, like, hockey is just shoved in there. It will always come up in our conversation because it’s such a big part of our lives but when I’m with my friends who don’t play hockey it’s completely different. We talk about other meaningless rubbish but it’s quite nice to just have that complete break. I kind of lose my way with it sometimes just because it’s so intense. Athlete 7.

Second, fixed training schedules and program directives can lead athletes to feel they have limited control over their lives. Third, following the same daily routines and spending much time in the same physical and social environments leads to experiences of tedium. Fourth, the need to postpone and forego many activities outside of sport leads to a sense of missing out on aspects of life outside of sport.

These psychological experiences can be deleterious to feelings of being well‐rested (Table 20.1, Column 3). First, thinking about one’s sport elicits feelings of anxiety due to the association of this subject with pressures to perform and, consequently, is mentally effortful. In turn, *always* thinking about one’s sport, due to constant engagement in the sport, is mentally fatiguing and leads to reduced motivation to engage in one’s sport. Second, experiencing little control over one’s life due to fixed training schedules and program directives leads to frustra- tion and in turn reduced motivation to engage in one’s sport. Third, experiences of tedium lead to reduced motivation to engage in one’s sport. Fourth, a sense of missing out on aspects of life outside of sport leads to frustration, which, again, leads to reduced motivation to engage in one’s sport. The following quote from an athlete evidences frustration at missing out on aspects of life outside of hockey.

When I first came [to university] I wanted to get involved in everything. I was going to play lacrosse, do music, all these kinds of things, and as I’ve gone on I’ve had to drop out of quite a lot because I can’t balance my stuff effec- tively and also perform at the highest level. I feel like I’m here and I need to make the most of it. I need to be going out seeing friends. . .not just sitting in my room. And I think because your friends [who don’t play hockey] don’t have that. . .they don’t feel like they need to rest, they can do that and not feel guilty. But for me it’s like, oh, wait, I should stay and just relax a bit. Athlete 5.

However, these deleterious psychological consequences can be reduced via engagement in key resting expe- riences (Table 20.1, Column 4). First, anxiety, mental fatigue, and reduced motivation arising from always thinking about one’s sport are ameliorated by experiences of: (1) reduced thinking about one’s sport; and

(2) reduced effortful thinking more generally. Second, frustration and reduced motivation to engage in one’s sport arising from feeling externally controlled are ameliorated by experiences of internal control. In the following quote, the athlete describes how rest involves the assumption of internal control.

Interviewer: And when you are getting rest, what would you say that you are resting from? Athlete 4: Like not having to stick to a schedule that someone else is putting in front of you. You’re able to just do what you want whenever you want and I think that’s a big factor to just unwind. . .of having it very structured from someone else, and then you’ve got your time to just do what you want.

Third, reduced motivation to engage in one’s sport arising from tedium is ameliorated by experiences of increased variety in one’s life. Fourth, frustration and reduced motivation to engage in one’s sport arising from a sense of missing out on aspects of life outside of sport are ameliorated by opportunities to engage in these aspects.

Various contextual conditions help athletes obtain certain resting experiences (Table 20.1, column five). First, thinking about one’s sport is reduced by engaging in activities, and social and physical environments, unrelated to one’s sport, which is evident in this quote by an athlete.

“And like for me, that includes just talking to people from home, like that’s just a way for me to escape here.

And not think about things that are here. Escape, like, things about hockey.” Athlete 1.

Second, effortful thinking more generally is reduced when the athlete engages in activities, and social and physical environments, imposing a low level of cognitive demand. Third, the athlete perceives greater inter- nal control when he or she engages in activities, and social and physical environments, involving few exter- nal imperatives. Fourth, experiences of variety are brought about by engaging in activities, and operating within social and physical environments, that are different from those characterizing the athlete’s typical day spent training or competing during the season. In the following quote, an athlete describes attempts to do something on a rest day that are different from the activities undertaken during a typical training day.

You’re just going around to see a friend or going for a walk like just making sure that you’re not getting really repetitive in what you’re doing and having a different break. Athlete 15.

##### Evidence of Reduced Social Interaction and Engagement in Solitude by Athletes During Rest Days

The athletes we interviewed received two rest days per week during the season. The athletes provided evidence in their interviews of reducing social interaction or engaging in solitude, or both, during at least some of the time available to them during these two rest days. The prototypical form of reduced social interaction involved spending time with: (1) only a few individuals; and (2) individuals who were close friends or family members. This social environment contrasted with the social environment characterizing the remainder of their week, which involved being around many students in lectures, and many teammates during training, where these individuals were not family members and not all close friends, and being in large groups during social events such as “nights out” in the city. This athlete describes limiting their social environment during rest days to either being alone or being with a single close friend.

I think it starts like as soon as you finish the exercise that you’ve just done, so cool‐down properly, ice‐bath properly, and then make sure you eat the right things, have a really good night sleep, and then the next day have a complete day where I think you mentally it’s good to have time to yourself or time with a friend that you’re very comfortable with or whatever, do something that you really enjoy, stuff like that. Athlete 10.

The prototypical context associated with engagement in solitude articulated by the athletes involved spend- ing time: (1) at home; (2) in one’s own bedroom (athletes typically shared their house with other students);

(3) in bed, in the bath, or with one’s feet up; and (4) watching TV, listening to music, reading, or surfing the web. Although less commonly reported, athletes also described spending time alone outside the home engaged in activities such as shopping, walking, eating at a restaurant, and going to the movies. The following quote provides an example of the desire to be alone inside one’s own home.

“I also live by myself which is quite nice because I can come back and just like shut the door at the end of the day and if I want time alone, like that’s what I can have, which is sometimes what I need.” Athlete 2

##### Solitude as a Facilitator of Athletes’ Resting Experiences

Spending time in solitude during rest days appears to help athletes obtain the resting experiences described above, which in turn enhances their feeling of being well rested. For each of these resting experiences, we now outline the mechanisms by which spending time alone might help in this regard.

*Reduction in thinking about one’s sport.* Being alone better enables athletes to engage in activities, and social and physical environments, that are unrelated to their sport, which helps them think less about their sport (see Table 20.1). As described, athletes spend much time per day with their teammates, and also often live with teammates in shared student housing. By spending some time alone during rest days, athletes avoid interactions with teammates, and thus conversations about their sport. Theoretically, spending time alone might actually increase opportunities for rumination about one’s sport, and in particular about negative aspects of one’s sport (see Eccles et al., 2020). However, athletes often chose when alone to engage in activities and environments that

are unrelated to their sport, which effectively occupies their attention with non‐sport‐related material and thus reduces opportunities to think about their sport. The athlete’s choice of non‐sport‐related activity and environment is facilitated by being alone because the athlete has sole control over their activities and environments. For example, when watching TV, athletes are able to have control over what is watched and thus typically chose content unrelated to their sport, which means they think less about their sport, a concept illustrated in the following quote: “So with my Netflix for example, so just like switching off from like thinking about anything, just being by myself. . .not thinking about hockey, just chilling.”

*Reduction in effortful thinking generally.* Spending time alone during rest days enables athletes to engage in low‐ cognitive‐demand activities, and social and physical environments, which helps them reduce effortful thinking generally (see Table 20.1). First, the presence of others has cognitive costs such as those associated with the need to communicate and be socially interactive. Being alone removes these costs, as this athlete describes: “I think I would view time by myself as more of a rest, because you’re not having to interact with anyone or... So it’s just like a shut‐down kind of.” Second, as described, spending time alone affords the athlete greater control over their activities and environments. Therefore, athletes often chose during their rest days to engage in activities and environments that impose only a low cognitive demand such as taking a bath and listening to music. It is also likely that reducing social interaction during rest days by spending time with only a few close friends reduces cognitive costs associated with communication. Spending time with a *few* friends contrasts with spending time with many teammates during the typical training week and likely reduces the cognitive costs of communication; with only a few friends, it is likely that there is less communication overall and that communication is easier (e.g., there are fewer concurrent conversations). Spending time with *close* friends contrasts with spending time with teammates who are not all close friends during the typical training week and likely reduces the cognitive demands associated with social presentation; that is, it is likely that athletes “can be who they are” more easily around people with whom they are close.

*Increase in internal control.* Spending time alone during rest days also reduces external imperatives and thus enhances opportunities for athletes to experience internal control (see Table 20.1). When alone, athletes can select and discard activities and move between environments at their discretion and in response to momentary needs and desires; they do not need to follow the directions of others or justify their behavior to others. This experience of internal control allows the athlete to obtain some rest from feelings of external control that accompany much of their typical training week. In this quote, a coach illustrates how he appreciates how athletes need to have time during rest periods when they perceive they have a break from feeling controlled by their program and experience greater control over their lives: “So, it’s very much giving them a clear stop and start point again [in the training schedule] and then allowing them to be able to go and do their own thing.”

*Enhanced variety in one’s life and an increase in opportunities to engage in aspects of life outside of sport.* As described, spending some time alone during rest days affords the athlete greater control over their activities and environments. This increased control not only provides a resting experience in the form of enhanced perceptions of control, the concept outlined in the previous subsection, but also helps the athlete obtain two other resting experiences. First, athletes often chose when alone during rest days to follow routines and in engage in activities and environments that differ in nature from those that characterize their typical training week, encapsulated by one athlete as “just something I would not normally do on a typical day.” For a few hours on a rest day, the athlete can experience some variety in their life, allowing them some rest from tedious aspects of their sport program. Second, the control afforded by being alone on rest days allows athletes to temporarily “indulge” themselves in aspects of life outside of their sport such as a cooking favorite foods or catching up on a favorite TV show or with some reading of an interesting book. Opportunities to indulge in aspects of life outside of the athlete’s sport reduces frustrations associated with a sense of missing out on aspects of life outside of sport and in turn increases the athlete’s motivation to reengage with their sport.

##### Role of Solitude in Aiding Athlete Recovery, Promoting Motor Skill Learning, and Accelerating the Development of Expert Sports Performance

The findings of our study (Eccles & Kazmier, 2019) suggest that spending time in solitude may play a role in aiding athletes’ recovery following training and competing. A key resting experience proposed in the model involved opportunities to not think about one’s sport. This concept appears similar to the concept of psycho- logical detachment from organizational psychology, which has been linked to effective mental recovery in athletes following engagement in demanding aspects of their sport (Balk et al., 2017). However, few insights have been provided within the research on recovery in athletes about how such detachment might occur. Our model of the psychology of rest in athletes may provide some insights in this regard. In the model, psychologi- cal detachment was facilitated on rest days by engagement in activities and environments unrelated to sport and, simultaneously, avoidance of activities and environments related to sport. Being alone helped achieve these ends. By spending some time alone during rest days, athletes avoided their teammates and thus conversa- tions about their sport, which cued them to think more rather than less about their sport. In addition, being alone provided the athlete with greater control over their activities and environments, which meant they were able to more easily engage in activities and environments absent of cues that would have reminded them of their sport (e.g., reading fiction).

In addition, the functions of rest in our model of the psychology of rest in athletes extend beyond promoting recovery from training‐ and competition‐induced physical and psychological fatigue, which has been the function of traditional focus within the research literature concerned with athlete recovery (e.g., Loch et al., 2019). One additional function of rest proposed in our model is to afford athletes perceptions of internal control, which helps alleviate athletes of frustrations arising from perceptions of enduring external control by their sport program. This “control” function appears consistent with the concept of basic psychological need satisfaction following psychological need frustration, at least in relation to the need of autonomy (Ryan & Deci, 2000, see also Nguyen, Ryan, Weinstein, & Deci, Chapter 16). Thus, the role of rest in promoting recovery in athletes operating within a sport program might be to afford those athletes opportunities to experience autonomy in a weekly schedule otherwise characterized by perceptions of external control. A key means by which athletes obtain experiences of autonomy involves being alone because, when alone, the athlete is immersed in an environment within which he or she is presented with few external imperatives (e.g., the needs, desires, & impositions of others).

Our study findings also foreground the potential for solitude to enhance motor skill acquisition in sport contexts. Research has provided evidence that practice schedules that include rest breaks benefit motor learn- ing (Shea et al., 2000). However, there have been few insights into how the qualities of these rest periods dif- ferentially affect the learning process. As described above, recent research has indicated that more (versus less) quiescent rest periods following the practice of novel tasks, described as involving little sensory stimulation, benefit learning on those tasks (e.g., Craig et al., 2018). The explanation for this finding is that quiescence affords undisrupted memory consolidation. The concept of quiescent rest appears akin to the resting experi- ence described in our model of the psychology of rest as reduced effortful thinking, where obtaining this expe- rience is facilitated by engaging in low‐cognitive‐demand contexts.

A key means by which athletes achieve such low‐cognitive‐demand contexts, and thereby reduce effortful thinking, is to spend some during rest days alone. By being alone, the athlete: (1) avoids mental work associated with socializing; and (2) can create an environment with little sensory stimulation (e.g., listening to music). Athletes spend much time during training learning and refining technical and tactical skills. It is plausible that athletes’ engagement in quiescent environments during the days of rest that follow such training, as we observed in our study, is driven by an implicit need to obtain contextual conditions (i.e., activities, environ- ments) that afford memory consolidation. In line with this theorizing, survey research has indicated that skilled athletes spend more time than their less skilled counterparts deliberately using relaxation techniques during time outside of training and competing, where these techniques presumably help induce quiescent psychologi- cal states (Kudlackova et al., 2013).

Our study also highlights the potential role of solitude in the development of expert sports performance. Within the deliberate practice framework (Ericsson et al., 1993), the *effort constraint* describes how deliberate

practice is highly effortful, and thus how such practice must be limited to ~4 hours per day, and individual practice sessions to ~80 minutes each. The remainder of the individual’s time must be spent resting to enable full recovery prior to engagement in their next session of deliberate practice. Sport psychologists interested in applying the deliberate practice framework to the study of expertise development in athletes (e.g., Baker & Young, 2014) have paid little research attention to the rest periods that necessarily accompany engagement in deliberate practice according to the theorized effort constraint. In particular, little is known about the psycho- logical qualities of this resting process in athletes.

Our study may offer some insights in this regard. According to Ericsson et al. (1993), deliberate practice requires full concentration, and thus such practice is usually undertaken alone to achieve environmental conditions conducive to this level of concentration. Likewise, our study suggests that rest days often involve some time spent alone with the aim of achieving environmental conditions conducive to effective resting process such as low‐cognitive‐demand environments that afford a reduction in effortful thinking. Further research is required to construct expert models of rest in athletes that can serve as basis for inform pro- grams aimed at accelerating the development of expert sports performance (Eccles, 2006; Eccles & Arsal, 2015).

##### Implications for Research on Solitude

Our research on the psychology of rest in athletes (Eccles & Kazmier, 2019) connects with the extant literature on solitude in the general population. First, in their interviews, athletes provided reports consistent with the concept of *aloneliness*, described as negative feelings arising from the perception that one is not spending enough time alone (Coplan et al., 2019). Generally, athletes’ reports evidenced a desire to spend more time alone or with a few close friends. For example, athletes reported that an effort to build team cohesion involved team members taking turns each week of the season to cook pasta at their home for all the team, an event known as “pasta bonding.” Although these athletes appreciated the rationale for pasta bonding, they also described how the event consumed the limited time they had available during their week for resting and particularly by spend- ing time alone or with a few close friends. One athlete described this situation as follows: “Pasta bonding, I’m hosting that, so that will feed out of my, like, alone time.”

Our research also has implications for understanding the possible positive effects of solitude. Whereas these social conditions are archetypally associated with negative well‐being, some research on solitude has shown that these conditions can have positive effects on well‐being (Coplan et al., 2018). Athletes in our study reported that being alone was beneficial to the process of resting and in turn to feelings of being well rested, where this state of being well rested was described by athletes in ways consistent with enhanced well‐being (i.e., feeling fresh, motivated, etc.). Our study also provided some insights into the “active ingredients” by which solitude might have beneficial effects (Coplan et al., 2018, p. 141). Specifically, being alone afforded opportunities for athletes to engage in key resting experiences. Obtaining these experiences, in turn, appeared to have at least two key effects related to well‐being.

First, being alone allowed the athlete opportunities to reduce effortful thinking, which appeared to have restorative effects following experiences of mental fatigue (cf. Coplan et al., 2018). This restoration effect appears to arise due to the reduced cognitive and emotional labor associated with being alone or with a few close friends versus being with a larger group that includes members with whom the athlete is less familiar. When athletes are alone, they do not need to communicate (i.e., listen, interpret, formulate responses, & speak) and thus avoid the cognitive costs associated with communication. In addition, when alone, athletes can adopt a mood state of low activation and subdued emotion consistent with minimal effortful thinking (a key resting experience in our model) but incompatible with effective socializing. Thus, being alone avoids the need when in company to suppress any “low” feelings and induce a more positive, activated outward countenance conducive to effective and harmonious socializing (Hochschild, 1983).

Collectively, these findings accord with research indicating that social interaction, while beneficial to overall well‐being, is mentally fatiguing (Leikas & Ilmarinen, 2017), leading individuals who are already tired

to withdraw socially (Repetti, 1989). Second, solitude allowed the athlete opportunities to experience greater autonomy; specifically, when engaging in what athletes often referred to as “their time,” which typically involved being alone, there was no need to consider others’ needs or desires. In turn, athletes were able to satisfy their psychological need for autonomy following frustration of this need from externally determined training schedules and lifestyle directives (e.g., concerning diet) (Ryan & Deci, 2000).

Finally, prior research has provided evidence of how motives to spend time alone moderate the extent to which this time is perceived as enjoyable. Deliberately choosing to spend time alone is associated with enjoying this time, where the opposite is true when individuals spend time alone but did not chose to (Nguyen et al., 2018). Typically, athletes in our study appeared intrinsically motivated to spend some time alone during rest days to the point that they appeared to experience aloneliness when their schedule did not permit enough time alone, and when they did spend time alone, they appeared to enjoy this experience. However, on occasions, athletes reported wanting to attend social events on a rest day preceding a competitive game but choosing to forgo these events so that they could stay home and rest, usually alone, in preparation for the game. In this situation, athletes appeared to begrudge their solitude and presumably because the choice to spend time alone now involved more extrinsic motives.

##### Directions for Future Research

Research is needed to establish the generalizability of the model of the psychology of rest proposed by Eccles and Kazmier (2019) given that athletes in their study played a team sport, and were female, collegiate, and from one country. For example, athletes’ motivation to engage in solitude on rest days might depend on how they value being alone, and prior research has indicated that the values individuals hold in relation to engaging in solitude can differ by culture (Averill & Sundararajan, 2014). Furthermore, it is likely easier for athletes who play individual sports (vs. team sports) to avoid individuals associated with their sport (e.g., teammates) on rest days and thus to stop thinking about their sport on these days.

It is also unclear how the model by Eccles and Kazmier (2019) might hold for highly publicly visible national and professional athletes. Such athletes are frequently identified and approached by the press and public, which places constraints on various aspects of their lifestyle. The former elite soccer player Stephen Gerrard has discussed how he is unable to spend time in public venues in his home town of Liverpool, UK, due to his fame; doing so invites much attention from members of the public and not all of it friendly (Gerrard, 2007). Visible athletes also often feel that their lives are under constant scrutiny by the press and public, which is often proposed as like living in a “fishbowl” (e.g., Tanier, 2019). They also often experience pressure to present themselves in ways consistent with expectations of the press and public, regardless of their actual identity and emotional state (Douglas & Carless, 2015). What rest means to these athletes and how they achieve it in this social context is currently unclear but anecdotal evidence suggests reducing of this level of social attention is a necessary condition to achieving rest in psychological terms. When Brett Favre reports hiding at his home in Mississippi (described above), which is a great distance from the cities in which he played, it is likely that being at home, in the town he was raised in, affords him rest, *inter alia*, from this level of social attention. Future research should target these questions, the answers to which have important implications, including for professional athletes’ mental health (Roderick et al., 2017).

##### Implications for Practice

Our study of the psychology of rest in athletes (Eccles & Kazmier, 2019) provides a foundation for deriving strategies for best practice concerning athlete rest. Although research is needed to test the efficacy of these strategies in applied settings, in the meantime, practitioners will benefit from considering how these strategies might inform their work with athletes and other stakeholders in sport. As such, in Table 20.2, we offer acces- sible information aimed at increasing awareness in athletes, coaches, and other practitioners of how some time spent alone during rest days might be useful in helping athletes obtain the mental rest they need.

##### Conclusions

In this chapter, we presented evidence from a recent study we conducted that skilled athletes reduce social interaction and engage in solitude as means to obtaining mental rest. We proposed that our study findings not only contribute to our understanding of athlete recovery, motor skill learning, and the development of expert sports performance but also have implications for theory and research on solitude. We look forward to continu- ing research that is aimed at uncovering the mechanisms by which engagement in solitude conveys benefits to athlete populations.

### From Shyness to Social Anxiety: Understanding Solitude in the Context of Immigration

*“. . .I mean, the solitude of being an immigrant, the solitude of having to learn a language and a culture from scrap, led me to the need for some sort of explanation, the need for answers, the need for something that would give me – that would in some ways shelter me, led me to books. . .”. –Author Junot Díaz, in a 2008 NPR interview, on the American immigrant experience.*

##### Introduction

While Mr. Diaz’s interview is mostly about his story of becoming an author as an immigrant, his reflection on solitude and how it impacts his life journey characterizes a fundamental aspect of experiences with which most immigrants can identify. Solitude, that is, spending time alone or lacking social interaction, is a complex phenomenon, which requires careful explication by scientists (see Chapter 1 of this handbook; also see Coplan et al., 2019). Although previously conceived as having primarily negative implications for well‐being (e.g., Larson et al., 1985), more recent accounts of solitude have elucidated the complex nature of this construct and how it may include beneficial aloneness (see Chapter 6), or represent an adaptive approach to affective self‐regulation (see Chapter 20). However, for most immigrants, solitude often involves unpleasant experiences of fear and discomfort with interacting with others, particularly with members of the host culture or majority group who may speak different languages or accents, possess dif- ferent cultural norms, believe in different religions, and sometimes hold stereotypes of and discriminatory attitudes against them.

At the core of what distinguishes various experiences of solitude is the concept of *choice*; that is, the ability to make a deliberate choice to spend time alone, which may reflect individual autonomy and emotional self‐regulation and thereby afford positive solitary experiences (Coplan & Bowker, 2014; Nguyen et al., 2018). Nguyen and colleagues (2018) argue that people may spend time alone because they enjoy solitude as a way of regulating their behavior with a great sense of autonomy. In contrast, when they felt forced into spending time alone, the amount of time alone was associated with increased loneliness and decreased life satisfaction.

Unfortunately, choice is not always something afforded to immigrants. Immigrants are confronted with a new reality in the host culture, in which their cultural norms, values, language and customs become less rele- vant or disrespected by the host culture. Consequently, they may have no choice but to spend time alone

(Dolberg et al., 2016). In the context of immigration, some solitude is involuntary, involves primarily reactions to unfamiliarity/ discrepancy of the new environment, negative social evaluations by the members of the host culture or majority group, and in some cases stereotypes of and discriminatory attitudes against them (Huynh et al., 2011). Accordingly, solitude may manifest not only as shyness, but also as social anxiety in such inter- group contexts (i.e., between immigrants and the host or majority group) that involve intense fear and avoid- ance (Stephan, 2014). It is this latter form of *involuntary solitude* that is of the primary focus of the current chapter.

Involuntary solitude is somewhat similar to, but distinct from social isolation in the developmental literature on peer relations. Rubin (1982) discussed social isolation in the context where the individual is excluded, rejected, or ostracized by their peer group. Similarly, a recent review proposes that social isolation describes the child as being actively excluded by peers from participating in social activities (Rubin et al., 2009). As suggested by Stewart and Rubin (1995), social isolation resulting from peer rejection or exclusion is often assessed by sociometric measures such as peer nominations and captures important negative inter‐individual experiences within peer groups. In contrast, involuntary solitude involves mostly rejecting and isolating intergroup experi- ences between members of immigrant groups and members of host society, particularly the majority group in the host society.

##### Solitude in the Context of Immigration: The Experience of Being “Othered”

Immigration refers to people’s movement from their country of origin to another county for residential rather than visiting purposes (Castelli, 2018; Castles, 2000). Immigration may be voluntary or forced (Castelli, 2018). Voluntary immigrants are those who leave their homelands by choice in pursuit of promising employment, economic or educational opportunities, marriage, and family reunification (Berry, 2006; Castles, 2000). In con- trast, forced migrants include refuges and asylum seekers (Castelli, 2018). The current chapter focuses on vol- untary immigrants because refugees and asylum seekers tend to face different adaptation and acculturation issues (Schwartz et al., 2010).

Immigrants vary in their or their parents’ countries of birth and may be considered of different generations (Duncan & Trejo, 2017). First‐generation immigrants refer to foreign‐born individuals who have voluntarily moved from one’s native country to another host country (Bradby et al., 2015) whereas second‐generation immigrants include individuals born in the host country and have at least one foreign‐born parent (Duncan & Trejo, 2017; Schwartz et al., 2010; Zhou, 1997). Contemporary immigrant children who arrived in the host country during preschool age are also considered second‐generation immigrants because they share linguistic, cultural, and developmental experiences similar to those of immigrant offspring born in the receiving country (Zhou & Bankston, 1998). First‐ and second‐generation immigrants are often grouped under the “immigrant” umbrella because they are treated similarly by the larger majority culture, particularly if they are immigrants of color (Huynh et al., 2011). As such, the term “immigrants” will be used to refer to both first‐ and second‐ generation immigrants in the current chapter.

Regardless of their generations, one of the most salient experiences shared among voluntary immigrants, especially those who are visible minorities, is being “othered” (Epps & Furman, 2016). That is, explicitly or implicitly, immigrants are often perceived as not belonging to the same social category as members of the majority groups in the host society and are thus treated differently than nonimmigrants. Therefore, attempts to understand solitude in the context of immigration requires consideration of the social categorization of immigrants. In particular, it is important to pay attention to how this social categorization process is shaped by factors such as the languages spoken by and the accents of immigrants, their acculturation styles, and how the experiences of solitude may be manifested in shyness and social anxiety in the intergroup context.

*Social categorization of immigrant.* Despite growing numbers of immigrant populations, immigrants, especially those who are visible minorities, are usually categorized as a social group that is foreign to the host society. Research has shown that children and adults alike readily use social categories such as gender

and race to divide their worlds into “us” and “them” (Fiske, 1998; Liberman et al., 2017), and specific to the United States, children as young as five years old are able to categorize who is American and who is foreign (DeJesus et al., 2018). Categorizing a person as an immigrant involves attending to cues such as discrepancies in language, accent, cultural and ethnic backgrounds, religions, skin tone or other visible markers. At the crux of this categorization is the idea that immigrants are “foreign” or “not from here,” regardless of whether immigrants are born in the host country. Questions or comments such as “where are you really from?” or “you speak good English (or other languages of the host cultures)” carry the implicit message of “you are not one of us” and reflect the categorization of immigrants as a distinct “foreign” group (Sue & Sue, 2008).

*Foreign languages and accents.* Speaking a foreign language or with a foreign accent appears to be one of the most salient cues that children and adults use to determine immigrant status (Giles & Billings, 2004; Gluszek & Dovidio, 2010; Rodriguez et al., 2002). On the one hand, proficiency in the language of the host culture is considered foundational in the process of acculturation (Finch et al., 2000; Gordon, 1964; Kim et al., 2011; Uba, 2002), and the lack thereof can be seen as a sign of unwillingness to acculturate or inability to adapt to the mainstream society (Rodriguez et al., 2002). On the other hand, many children of immigrant families are disadvantaged with regards to learning the language of the host country (Cheah & Leung, 2010; Shields & Behrman, 2004; Zhou & Xiong, 2005) and are likely to live in linguistically isolated households where no one over the age of 13 is fluent in the language of the host country (Hernandez et al., 2010). It is thus not surprising that speaking a foreign language or accent defines one key attribute of the social category of immigrants, particularly first‐generation immigrants, and often shapes members of the host country or majority group’s perception of and relationship with immigrants. For instance, children as young as five to six years old exhibit biases toward those speaking foreign languages or with foreign accents, and they often prefer to play with or be friends with native speakers than with foreign language speakers or foreign‐accented individuals (DeJesus et al., 2018; Kinzler & DeJesus, 2013; Kinzler et al., 2007; Kinzler et al., 2009; Souza et al., 2013). In addition, immigrant adolescents with foreign accents are often harassed by peers at school (Chen & Tse, 2010; Qin et al., 2008), and are viewed as less attractive than those without an accent (Cargile, 1997). Furthermore, the experiences of visible minorities as being “othered” often persist even when accents are mostly gone. For instance, it is not uncommon for members of second‐ and higher generation immigrants to face questions such as “Do you speak English?” or comments that express surprise at their English language proficiency from members of the majority group in an English‐speaking host society. Such questions and even feedback that may appear complimentary reflect some members of the majority group’s implicit categorization of immigrants as a different social group (i.e., the “other”) based on often incorrect assumptions of language capabilities.

*Separation, marginalization, and involuntary solitude.* Even for immigrants who are able to speak the language of the host country without an accent, being a member of the social category of immigrants still involves experiencing the unique process of acculturation that sometimes results in separation and marginalization, both of which could also lead to involuntary solitude. Acculturation refers to how immigrants adapt to the host culture and the changes in their beliefs, values, and behavior that result from contact with the new culture and its members (Berry, 1993). In Berry’s (1993) model, there are four ways immigrants can associate with their host culture. They can *assimilate* (identify solely with the mainstream culture and sever ties with their own culture), *marginalize* (reject both their own and the host culture), *separate* (identify solely with their group and reject the host culture), and *integrate* (become bicultural by maintaining aspects of their own group and selectively acquiring some of the host culture).

Immigrants are often portrayed as having a strong preference for retaining their ethnic and cultural prac- tices, leading to their struggles to become full citizens of the host country (Goto et al., 2002; Kitano & Daniels, 2001). This unilateral view of acculturation held by many members of the host culture assumes “assimilation” into the mainstream society of the host country as the only ideal way of acculturation, and

misinterprets the maintenance of one’s cultural customs, language, food preference, and values as distance from and resistance to the mainstream culture (Berry & Kim, 1988; Espiritu, 1997; Kim et al., 2011; Shah, 1994; Yang, 2006). With the rejection of their ethnic and cultural beliefs and practices by the mainstream society, some immigrants may adopt a *separated* acculturation style and detach themselves from interacting with the mainstream society; others may struggle to identify themselves with either their native or the host culture, and eventually become *marginalized* and alienated toward both their own group and the mainstream society (Berry, 1997).

Research conducted with immigrant populations in different contexts has shown that the failed attempts at participating in the host society by immigrants who are characterized by *separated* or *marginalized* acculturation styles may result in involuntary solitude, accompanied by mental health problems such as social anxiety and depressive symptoms in both adolescents and adults. For instance, Brand and colleagues found that *separated* and *marginalized* Turkish adult migrants in Germany reported poorer mental health than migrants who had an *integrated* acculturation style (i.e., those who identified themselves with and participated in both their native and the host cultures; Brand et al., 2017). Another study showed that *marginalized* older Turkish and Moroccan migrants in the Netherlands felt lonelier than other migrants (Klok et al., 2017). Similarly, Vietnamese immi- grant adults in Germany with a *marginalized* acculturation style reported higher levels of depression compared to migrants with an *integrated* acculturation style (Nguyen et al., 2017) and *separated* or *marginalized* Asian Indian immigrant adolescents in the U.S. reported poorer psychological functioning than did adolescents with an *integrated* acculturation style (Farver et al., 2002). Taken together, these findings are in line with the predic- tion of Berry (1997)’s acculturation model, which proposes that *separated* or *marginalized* acculturation styles or strategies may cultivate immigrants’ sense of loneliness and isolation.

*The process of immigration and experiences of shyness in intergroup contexts.* One implication of being a member of the social category of immigrants is the inevitable adaption to an unfamiliar social environment that is full of uncertainty and risks; such experiences resemble primarily eliciting contexts for manifestations of shyness (Asendorpf, 1989, 1990), which, when combined with chronic negative social feedback, may lead to what Asendorpf (1990) referred to as social inhibition, in response to the experiences of being “othered,” or involuntary solitude. Research has shown that when meeting strangers, some individuals experience shyness, which is characterized by inhibited behavior accompanied by a fear of novelty or uncertainty in unfamiliar social situations (Rubin & Coplan, 2010). Shyness toward strangers can be identified as a temperamental attribute in young children that is often referred to as temperamental shyness (Kagan, 1994; Xu et al., 2020). Unfamiliar social situations also present salient cues that can activate shyness in adults (Russell et al., 1986; Zimbardo, 1977). Many adults may expect unsatisfactory impression‐relevant reactions from people with whom they are not familiar with (Asendorpf, 1989). This is an experience many immigrants can identify with when interacting with unfamiliar members from an unfamiliar social group (often the majority group) in an unfamiliar host culture that is characterized by unfamiliar social norms and expectations.

Immigrants often come to metropolitan areas of the host culture that represent a “novel” social environ- ment and are disconnected from the community with which they were familiar. Some may never settle and retreat to their own “niche,” living in neighborhoods with a greater proportion of residents of their own race or ethnicity (Halpern & Nazroo, 2000; Mair et al., 2010). However, most immigrants still want to interact with members of the host culture but at the same time are concerned about negative evaluations by nonimmigrant or majority groups. Accordingly, they may experience an internal conflict that resembles approach‐avoidance motivational conflicts that likely underlie experiences of shyness in these intergroup contexts (cf. Asendorpf, 1990).

The process of immigration involves intensive experiences of meeting with members of the host culture and majority group whom immigrants are not only unfamiliar with, but also differ from in language, accent, and ethnic and cultural practices. Such a process involves cues of social novelty, as well as those of negative social evaluation particularly by members of the majority group, which may elicit experiences of

anxious shyness in these intergroup contexts. Anxious shyness is activated mostly in social evaluative situ- ations (e.g., being criticized or expecting to be criticized by significant others such as authority figures or popular peers) where individuals are anxious or nervous about real or imagined negative feedback or disap- proval (Xu et al., 2020). In the intergroup relations between immigrants and members of the host culture, those of the majority group often play the role of “dominant or authority figures” and explicitly and implicitly evaluate immigrants’ qualifications as full citizens in the host society, regardless of immigrants’ generational standing. Given that integration into the host society and acquaintance with the new culture takes time even for second‐ and higher generation immigrants, the language and cultural discrepancies may lead to an invalidation of immigrants’ identities and even exclusion of immigrants from the main- stream society by members of the majority group. Furthermore, in the absence of adequate social support, immigrants may be particularly vulnerable to negative social feedback that could sensitize their experi- ences of shyness to not only cues of novelty, but also to cues of negative social evaluation. With experi- ences of unsatisfactory social relationships with the majority group, immigrants may become increasingly concerned about how members of the host culture may view them unfavorably (Ayalon & Shiovitz‐ Ezra, 2010). Some immigrants may withdraw into their ethnic communities (Logan et al., 2002; Ryan et al., 2008; Tsai, 2006), and when such an option is not readily available, they may experience involuntary solitude. Not surprisingly, immigrants regardless of their generational standing tend to report problems of loneliness and social isolation perhaps due to chronic condition of involuntary solitude (Hurtado‐de‐ Mendoza et al., 2015; Kim & Lee, 2014; Ponizovsky & Ritsner, 2004; Sanchón‐Macias et al., 2016).

In addition to shyness that is typically experienced in intergroup contexts for most immigrants, individual differences in temperamental shyness or anxious shyness may also play an important role in shaping immi- grants’ experiences of involuntary solitude. Both temperamental and anxious shyness may impede requisite adaptive aspects of the immigration process such as interacting with unfamiliar people and members of other social groups, including the majority group. Thus, the process of immigration and interaction with nonimmi- grant and the majority group in the host society may be particularly challenging for immigrants who are char- acterized by temperamental or anxious shyness. That is, the experiences of being “othered” are likely of higher risk to immigrants who are more vulnerable to social novelty and/or negative social evaluations. Immigrants with higher temperamental or anxious shyness predispositions may tend to immerse themselves in their own “niche” rather than attempting to be part of the larger host culture, and as a result, may be more likely to develop involuntary solitude in intergroup contexts than immigrants who are not as shy. In a study of Chinese American children of three to six years old who were born in first‐generation immigrant families, Balkaya and her colleagues (2018) examined not only temperamental shyness, but also children’s display of anxious‐ withdrawn behavior toward familiar peers (Balkaya et al., 2018). They found that temperamental shyness was positively associated with children’s anxious‐withdrawn behavior at school, suggesting that experiences of shyness among Chinese immigrant children were likely activated by cues of both social novelty and negative social evaluation by peers who were mostly members of the host culture. Although the study focused on individual differences in temperamental shyness, and did not directly examine shyness in intergroup contexts, these findings provide some preliminary evidence that a focus on experiences of shyness might be a key to understanding involuntary solitude in the context of immigration.

*Perpetual foreigner stereotype and intergroup (social) anxiety.* Another implication of being a member of the social category of immigrants is to face perpetual foreigner stereotype and consequential experiences of intergroup (social) anxiety. Developmental Intergroup Theory (DIT: Bigler & Liben, 2006, 2007) proposes that psychological salience of a social category may lead to the formation of social stereotypes of and discrimination against members of that social category. Factors hypothesized to increase the psychological salience of a social category include perceptual discriminability (to what extent a category is perceptually different or unique), proportional group size (the extent of the majority/minority balance between groups), and use of the social categories to signal differential social status. All of these factors can be easily identified in the social categorization of immigrants because immigrants often look or dress differently and

speak a different language or the language of the host culture with an accent, comprise minority groups in the host culture, and tend to hold lower social status than the majority group. As a result, immigrants have to confront the harsh reality of perpetual foreigner stereotypes (Chan, 1991; Goto et al., 2002; Kim, 1999; Kim et al., 2011; Shah, 1994) that often lead to social anxiety in general, and intergroup anxiety in particular (Stephan, 1999, 2014), consequently increasing the chances of experiencing involuntary solitude.

Perpetual foreigner stereotype refers to a form of negative perception of members of immigrant or minority groups as foreigners and/or second‐class citizens even though they might be born in the host country, or even have lived in the host country for many generations (Kim et al., 2011). Although percep- tual foreigner stereotype is more frequently studied for certain immigrant groups (e.g., Asian immigrants in the U.S.), DIT suggests that perceptual foreigner stereotype is not limited to these groups but represents a xenophobic image that many immigrants of different ethnic and cultural groups face. Because people tend to view strangers as “not one of us,” and thus as untrustworthy, being portrayed as “perpetual foreign- ers” may place immigrants at risk for detrimental social and psychological consequences. For instance, perpetual foreigner stereotypes were found to be related to lower self‐esteem and more depressive and anxiety symptoms among Sikh American adolescents (Do et al., 2019), and was associated with either per- ceptions of chronic daily discrimination (for girls) or discriminatory victimization experiences (for boys), which in turn, increased the risk of depressive symptoms among Chinese American adolescents (Kim et al., 2011).

Being perceived as foreigners even though immigrants may be citizens of the host country may also invali- date immigrants’ identities and ethnic and cultural heritages, leading to stressful experiences in social interac- tions with, and anticipation of social disapproval from, members of the host culture. The stress of intergroup contact and relations experienced by immigrants may be accompanied by social anxiety, which in turn, may result in involuntary solitude. Stephan and Stephan (1985) argued that in the context of intergroup relations, social anxiety often manifests in the form of intergroup anxiety. Intergroup anxiety is a type of anxiety that people experience when anticipating or engaging in intergroup interaction with members of other groups who are viewed as different in some significant ways (Stephan, 2014). For instance, concerns over what would hap- pen during interpersonal associations may hold immigrants back from interacting freely with members of the host culture.

Intergroup anxiety is accompanied by a negative cognitive appraisal that interaction with outgroup mem- bers will lead to negative consequences. People who experience intergroup anxiety worry about being nega- tively evaluated, rejected, stereotyped, disapproved, disdained, disrespected, ridiculed, or insulted by the outgroup (Barlow et al., 2010; Butz & Plant, 2006; Stephan, 2014; Stephan & Stephan, 1989). The behavioral consequences of intergroup anxiety include what characterizes involuntary solitude such as social isolation and avoidance of outgroup members in intergroup contexts. Given the social categorization of immigrants and perceptual foreigner stereotypes held by many members of the host culture, it is not surprising that interac- tions with members of the host culture may lead to an aversive reaction that is likely the cause of intergroup anxiety experienced by immigrants, with affected individuals being anxious about consequences of social inter- actions, and eventually leading to involuntary solitude.

##### Understanding Solitude in the Context of Immigration: Theoretical Models and Empirical Evidence

Despite some preliminary efforts on understanding solitude in the context of immigration, several important questions remain. Do immigrants tend to experience more solitude, particularly imposed or involuntary solitude, than members of the host culture or majority group and if so, what factors might help explain higher solitude among immigrants than nonimmigrants? Why would some immigrants be more likely to experience solitude than others? Are there any differences in the likelihood of experiencing solitude among immigrants of varying generations, developmental periods, ethnic and cultural backgrounds, and immigration history? What factors might help explain such differences? Unfortunately, few studies have directly addressed these research questions. The existing work has been limited to individual differences in solitude‐related psychological experi-

ences, such as shyness (e.g., Balkaya et al., 2018; Paulhus et al., 2002; Xu & Krieg, 2014) and social anxiety (Krieg & Xu, 2015), but not to involuntary solitude per se in intergroup contexts. Furthermore, as described below, most studies, particularly studies of social anxiety, focused on between group differences (e.g., comparisons of a particular immigrant group to the majority group in the host culture) and individual variations among mem- bers of specific immigrant groups (e.g., Asian immigrants in the U.S.). We know little about differences among immigrants of varying ethnic and cultural backgrounds who may have varying intergroup experiences with the majority culture.

*The self‐construal model and comparisons of social anxiety and shyness between immigrant and the majority groups in the host culture.* There is growing interest in understanding the higher social anxiety symptoms reported by some immigrant groups, particularly those of Asian heritage, relative to those reported by the majority groups in the host societies. Results of a meta‐analysis of about 40 studies indicated that immigrants of Asian heritage on average tend to report higher levels of social anxiety than those of European heritage or the members of the majority group in the host society (Krieg & Xu, 2015).

Drawing from Markus and Kitayama’s (1991) model of independent and interdependent self‐construal, Okazaki (1997) proposed that the higher social anxiety reported by Asian immigrant college students in the U.S. may be partly due to stronger interdependent self‐construal and/or weaker independent self‐construal than European American college students. Other than viewing oneself as autonomous and unique (i.e., independ- ent self‐construal; Markus & Kitayama, 1991), individuals of Asian heritage tend to view the self as connected with members of the immediate group and surrounding environment (Markus & Kitayama, 1991), and thus focus on creating and maintaining a sense of social harmony, which is accomplished with heightened sensitivity toward others’ feelings, opinions, and evaluations (Fung, 1999; Singelis, 1994). Therefore, heightened interde- pendent self‐and/or lowered independent self‐construal may lead to higher sensitivity to being rejected by others, particularly members of the majority group in the host culture, among Asian immigrants, which may in turn, lead to their increased fears or anxiety about disrupted relationships or being negatively evaluated by others.

Consistent with the self‐construal model, Asian American college students often report higher interde- pendent and lower independent self‐construal than European American college students (Krieg & Xu, 2015), and when self‐construals are examined as mediators, ethnic differences in social anxiety often decrease or diminish (Essau et al., 2012; Hong & Woody, 2007; Norasakkunkit & Kalick, 2002; Okazaki, 1997). For example, Ho and Lau (2011) examined the relation between self‐construals and social anxiety symptoms in a sample of 74 European American, 83 U.S.‐born Asian American, and 72 foreign‐ born Asian American undergraduate students. They found that interdependent self‐construal was posi- tively related to social anxiety whereas independent self‐construal was negatively associated with social anxiety, and that both types of self‐construals fully mediated the group difference in social anxiety between foreign‐born Asian Americans and European Americans, and between U.S.‐born Asian Americans and European Americans.

Most recently, Krieg and Xu (2018) found that the associations involving between‐group differences in self‐construals and social anxiety were partly mediated by higher threat bias among Asian American college students than European American students. That is, lower independent self‐construal and higher interde- pendent self‐construal that characterize Asian immigrants, as well as some other immigrant groups, may lead to selective attention to social threat/negative social evaluations, which in turn, leads to higher social anxiety. It seems that for Asian Americans, viewing oneself as more innately connected with social others, particularly those of the majority group in the host culture, increases the degree to which social situations are perceived as having “high stakes” (Buttermore, 2009) and are interpreted as having negative conse- quences (Amin et al., 1998). At the same time, viewing oneself as less autonomous and separated from social others may enhance the degree to which the social consequences of situations are perceived as personally threatening. These results correspond to Kitayama et al. (2007)’s proposition that independent and interde- pendent self‐construals form the basis for fundamental ways of subjectively interpreting social situations,

which may affect the extent to which threatening cues in social situations are attended to, perceived, and appraised.

One key limitation of the literature on comparisons of social anxiety between immigrants and the major- ity groups is the lack of differentiation between general social anxiety and context‐specific intergroup anxi- ety that represents a particularly salient experience to immigrants (Stephan, 2014). In contrast, several studies have examined how the group differences in self‐reported shyness between individuals of Asian and European heritages may vary as a function of the eliciting contexts. For instance, in a series of four studies, Paulhus et al. (2002) found that, consistent with the findings of group comparisons of social anxiety men- tioned above, Asian Canadian college students reported higher shyness toward strangers and more negative social evaluations relative to European Canadians. The group difference in self‐reported shyness was substantially larger for classroom contexts where there were explicit social evaluative cues (e.g., fear of being wrong) than during daily social interactions. In addition, Paulhus et al. (2002) found that Asian Canadian College students mentioned factors such as not belonging to the class in‐group and fears of unwanted atten- tion and judgment, as reasons for their self‐reported shyness in classroom context. These findings suggest that discomfort of participating in a salient intergroup context may partly explain shyness exhibited in class- room contexts by Asian Canadian students. Furthermore, the group difference in shyness was stronger for cross‐ethnicity socializing (i.e., when interacting with members of the host society), but became non‐signifi- cant when reporting on interactions with other peers of Asian heritage. Taken together, these findings pro- vided initial evidence for the importance of intergroup contexts in understanding self‐reported shyness and social anxiety among immigrants.

There are at least three other limitations, however, to the studies of social anxiety using the self‐construal model. First, higher social anxiety and corresponding group differences in self‐construals have only been con- sistently found when comparing immigrants of Asian heritage and the majority group in the host culture that is often of European heritage. Thus, it is unclear whether other immigrant groups also exhibit higher social anxiety than the majority group and if so, whether the self‐construal model can successfully explain such group differences. Second, despite some preliminary evidence with regard to individual differences in shyness and social anxiety among immigrant populations (e.g., Balkaya et al., 2018; Paulhus et al., 2002), we know very little about the relations of characteristics of intergroup contexts to shyness and social anxiety experienced by immi- grants in such intergroup contexts (i.e., when interacting with non‐immigrants and members of the majority group). For instance, to our knowledge, no studies have examined how perpetual foreigner stereotypes and consequential discriminatory attitudes held by the majority group (Kim et al., 2011) may impact shyness and social anxiety experienced by members of immigrant groups. Third, the self‐construal model is instrumental in explaining between‐group differences in social anxiety, but independent and interdependent self‐construals may not represent the key factors that contribute to individual variation in social anxiety and other solitude‐ related experiences among immigrants themselves (Krieg & Xu, 2015).

*The acculturative stress model and individual variations in shyness and social anxiety among immigrants.* Despite the higher social anxiety reported by some immigrant groups in comparison to the majority group in the host culture, there is also likely significant variability *among* members of immigrant groups in solitude‐related experiences such as shyness and social anxiety. The acculturative stress model proposes that the individual variations in shyness and social anxiety may be partly accounted for by the unique process of acculturation, which involves stress related to their different languages or accents, skin color, religions, and unique ethnic and cultural norms and practices, as well as the stereotypes and discrimination experienced by members of immigrant groups (Hsu et al., 2012).

Acculturative stress refers to distress that immigrant and/or minority groups experience when adjusting to life in a new context in which the new cultural practices, values, and goals are in conflict with their previously socialized cultural standards and may lead to elevated symptoms or experiences of social anxiety (Hsu et al., 2012). Okazaki (1997) found that in comparison to European American college students, Asian American students who were less acculturated to the social norms of American culture were more likely to report higher avoidance of, and distress in, social situations. Similarly, Hsu et al. (2012) showed that Asian American college

students reported higher social anxiety than not only European American students, but also students of East Asian nationals who, despite sharing ethnic and cultural heritage with Asian Americans, do not share the unique experiences of adapting to a new mainstream culture and accompanying acculturative stress. The accul- turative stress resulting from the conflict between varying ethnic and cultural values and practices may partly explain elevated social wariness, or shyness, and anxiety in social situations among Asian Americans. Furthermore, some Asian cultures may socialize great tendencies toward being quiet and reserved, which may be viewed unfavorably by members of the majority group in Western contexts. As a consequence, immigrants from these cultures, particularly those who are temperamentally shy, may find the expectations for sociability and assertiveness in Western host cultures to be especially stressful, which may further exacerbate their experi- ences of solitude.

The acculturative stress model also provides a framework that connects immigrant parents’ experiences of acculturation to their children’s psychosocial experiences related to solitude. However, most studies did not directly assess acculturative stress, but rather measured generation status or acculturation/assimilation to American mainstream culture (e.g., language preference, social participation). For example, in Balkaya et al. (2018) mentioned above, Chinese immigrant mothers reported their own behavioral acculturation toward the mainstream American culture, such as their English language use and engagement in American lifestyle and social activities with members of the host culture. Results showed that higher behavioral acculturation to the mainstream culture, perhaps suggestive of relatively low acculturative stress, was negatively associated with anxious withdrawn behavior in their immigrant children.

In another study of shyness in Asian immigrant elementary school children living in Hawaii (Xu & Krieg, 2014), parents were asked to rate their own behavioral acculturation based on their orientation to American mainstream culture and their Asian natal cultures separately. The results showed that neither American nor Asian orientation was associated with child anxious shyness at school. However, Asian American parents’ orientation to their Asian natal cultures was positively related to their children’s *regu- lated shyness*, a reserved, modest, and unassuming form of shyness that seems to be most salient among children of Asian heritage (Xu et al., 2020). In a similar vein, Balkaya et al. (2018) also showed that Chinese immigrant mothers’ encouragement of modest behavior, a desirable attribute in traditional Chinese cul- tures, represented a protective factor in the mediating pathways that connected preschool‐aged children’s temperamental shyness, anxious withdrawal, and adjustment problems. Specifically, temperamental shy- ness was less strongly related to negative social adjustment outcomes through diminished anxious‐with- drawn behavior when there was a stronger encouragement of modest behavior by Chinese immigrant mothers.

Taken together, studies of acculturation in relation to solitude‐related psychological experiences tend to adopt an individual difference approach and focus on varying acculturation styles as either protective or risk factors for developing involuntary solitude. It seems that immigrant parents with a strong orientation to their natal cultures may place the priority on encouraging their children to become a competent member of their own cultural groups and thus are likely to encourage behaviors such as filial piety, modesty, or regu- lated shyness, that are consistent with their cultural norms. However, it is unclear whether children from such immigrant families may be more or less likely to develop involuntary solitude than those with parents who are characterized by separated or marginalized acculturation styles, as described above. None of the studies reviewed above directly examined how children’s involuntary solitude may be associated with par- ents’ acculturative stress due to their unique intergroup experiences as immigrants (e.g., perpetual foreigner stereotypes or other forms of racial/ethnic discrimination), a gap that needs to be addressed in future studies.

*The need for an integrated model.* Garcia‐Coll et al. (1996) proposed that any theoretical models that intend to understand adjustment of immigrant children and families need to take into account not only factors that are similar between immigrant and nonimmigrant families such as individual strengths and resilience and characteristics of certain developmental periods, but also unique experiences of immigrants that are tied to

the process of acculturation and their social positions in the host society, reflecting how they are being treated as foreigners and/or minorities by the members of the majority group. In the developmental competence model for ethnic minority children, Garcia‐Coll et al. (1996) argued that the developmental pathways of ethnic minority children are influenced by multiple social position factors such as race, social class, ethnicity, and gender that often form the basis for perceptions of stereotypes and discrimination. At the same time, these social position factors and consequential experiences of stereotypes and discrimination constrain resources and opportunities available to them, which in turn, hinder the adjustment of minority children. These insightful suggestions also apply to any efforts to understand the adjustment of immigrant children and families.

Following Garcia‐Coll et al. (1996)’s propositions, a critical next step toward understanding solitude in the context of immigration is to elucidate and differentiate solitude that may be due to social position factors and related experiences that are relatively unique to immigrants from solitude that may be related to individual dispositional factors such as temperament and personality. While our chapter focuses primarily on involuntary solitude experienced in intergroup contexts by immigrants that are manifest as shyness and social anxiety, this is not to deny the critical roles of individual differences in temperament or personality that may play in shaping immigrants’ experiences of involuntary solitude. For instance, immigrant children may exhibit shyness toward strangers due to their inhibited temperament, or a concern about being unfairly treated by unfamiliar peers of the majority group. Similarly, immigrants may experience elevated social anxiety due to selective attention to cues of social threat in general, or because of their prior encounters of perpetual foreigner stereotypes and discrimination that occur in the intergroup context. An integrated model of solitude in the context of immigra- tion will need to distinguish these various aspects of solitude experiences and begin to measure both individual differences in shyness and social anxiety, and shyness and social anxiety elicited mostly in intergroup contexts. Such distinctions would have strong implications for future prevention/intervention programs that target soli- tude and social isolation experienced by immigrants. For instance, traditional social skill training programs might be more beneficial for solitude with strong dispositional basis, whereas training on coping with accul- turative stress and discrimination experiences may be more helpful for reducing solitude that is tied to unique experience of migration.

##### Summary and Future Directions

In summary, there is preliminary evidence to suggest that members of some immigrant groups on average tend to exhibit higher levels of shyness and more symptoms of social anxiety than the members of the host culture or majority group, which in turn, may lead to increased time spent in solitude. In addition, available evidence suggests that more intensive experiences of involuntary solitude among immigrants may be associ- ated with the unique process of migration and acculturation, the language barriers and accents, the stereo- types experienced by immigrants particularly perceptual foreigner stereotypes, as well as the resulting intergroup anxiety.

One limitation of the current literature is the lack of attention to immigrant *children*’s experiences of soli- tude. Most studies of solitude or social isolation targeted adult or senior populations. A few studies have exam- ined how parents’ experiences of acculturation might be associated with children’s psychosocial experiences that may lead to involuntary solitude, such as shyness or anxious withdrawal. However, to our knowledge, no studies have investigated immigrant children’s involuntary solitude in relation to their own acculturative stress related to “non‐shared” experiences of migration, such as accent bias and perpetual foreigner stereotype. A developmental perspective is needed to understand the development of solitude among immigrant children and adolescents by considering changes in social and cognitive development (e.g., formation of ethnic identity) in the context of unique experiences of migration and acculturation. Clearly, only longitudinal studies could help fulfill such purposes.

While all immigrants may be treated as members of an overall social category of “foreign” or “non‐native,” they also belong to other unique social categories that are tied to their unique ethnic, cultural, and religious

heritages. Consequently, it would be erroneous to assume that all immigrants would experience solitude in the same way or to the similar extent. For instance, some immigrant groups may have less language barriers, whereas others may experience additional stress due to their unique religious beliefs. Drawing from Garcia‐ Coll et al. (1996)’s model mentioned above, the context of immigration may not represent uniform experiences for various immigrant groups and the “non‐shared” experiences among different immigrant groups are also critical in understanding solitude in the context of immigration.

### Introversion, Solitude, and Happiness

Solitude is primarily a momentary experience, but it is also clear that some people are more prone to experience or desire solitude. The commonly discussed personality dimension of introversion‐extraversion describes this difference between people. *Introverts* tend to be reserved, timid, and quiet; *extraverts* are more social, talkative, and bold. Extraverts also tend to be happier (Anglim et al., 2020). As much as the prototypical “very happy person” might seem quite extraverted, some also wonder if this is really true. Couldn’t the quiet bliss of some tea (caffeine free) and a good book rival the lurid excess of an all‐night party? Perhaps introverts are equally happy, but keep it inside, less available for all to see. In this chapter, we explore personality differences in propensities for solitude, focusing on the dimension of introversion‐extraversion, and its link with psychological well‐being.

##### Overview of Introversion‐Extraversion

Popular conceptions of introversion and extraversion are often attributed to famed psychoanalyst Carl Jung, but empirical personality research on the topic has a history that is distinct from these. Beginning in the 1940s, Hans Eysenck (Eysenck & Eysenck, 1985) used theory, research, and factor analysis to distinguish a broad dimension of introversion‐extraversion (which included characteristics like sociability, assertiveness, and activity), from neuroticism‐stability (which included characteristics like anxiety, guilt, and shyness). In essence, Eysenck viewed active sociability as independent of psychological distress, rather than negatively correlated. A similar introversion‐extraversion dimension was derived by other researchers who worked toward a personality taxonomy from natural language ( John et al., 2008), an important precursor to the popular big five model of traits. Most personality psychologists now accept that about five broad fac- tors – extraversion (introversion), emotional stability (neuroticism), agreeableness, conscientiousness, and openness – define personality trait space. Viable alternative taxonomies exist, but extraversion is ubiquitous across them (Saucier, 2009). Finally, whereas Jungian conceptualizations often refer to *types* of people, con- temporary personality psychologists see introversion‐extraversion as a continuous, normally distributed dimension. We use type words (e.g., “introverts” or “extraverts”) for linguistic convenience, but intend to invoke the full dimension when doing so.

Viewing introversion‐extraversion in the context of comprehensive personality taxonomies underscores the vast breadth of the trait. The construct encompasses a substantial portion of the entire personality trait space. Narrower traits or facets each contribute to this “super trait.” Despite our focus at the broadest level, it is often useful to study these narrower traits as they can offer additional nuance (see many other chapters in this vol- ume). For example, whereas people who are *shy* desire more social contact but tend to be thwarted by anxiety, people who are *unsociable* seem content with their lower levels of social contact (Coplan et al., 2015 – see also

Nelson & Millet, Chapter 11), even while both can be described as introverted. However, some distinction might still be made at the level of broad traits. Anxiously shy people would also score high on neuroticism, whereas merely unsociable people would not (Briggs, 1988). Introversion is broad; there are many ways to be introverted. Still, recent popular conceptualizations of introversion sometimes portray it even more broadly than personality science (e.g., Cain, 2012). In particular, narrower traits associated with a rich mental life (e.g., thoughtfulness, introspection, imagination) are mostly independent of typical introversion‐extraversion scales, instead forming an important part of the big five openness factor. Some introverts have these characteristics, but a roughly equal number do not.

A primary conceptual characteristic of introversion is frequent experience of solitude. There is considerable empirical support for this notion. For example, at the level of one‐time self‐reports, broad trait introversion is correlated with narrower scales that directly assess the preference for solitude (Teppers et al., 2013; Toyoshima & Sato, 2019). Other studies have tried to estimate how much time people spend in solitary or social activities using the more concrete day reconstruction method and again find that introverts report more time alone (Oerlemans & Bakker, 2014; Srivastava et al., 2008). Further eliminating the possibility of recall bias, the experi- ence sampling method captures what participants are doing “in the moment” multiple times a day. Whether assessed via self‐reports or researcher‐coded audio recordings, studies yet again find that introverts spend more time alone and speak less (Breil et al., 2019; Sun et al., 2019; Wilt & Revelle, 2019). Thus, we can be quite con- fident that introverts are indeed more prone to solitude.

Despite this confidence, the effect sizes in this research are not enormous, and they tend to get smaller as methods go from global reports to specific behavior counts. Accordingly, although introverts may typically spend more time alone compared to their more extraverted counterparts, it is also worth considering that peo- ple deviate from their average or preferred behavior frequently (Fleeson & Jayawickreme, 2015). For example, situational demands (e.g., a job) or other personal goals (e.g., getting a date) might require dispositional intro- verts to *act* extraverted and vice versa. Research suggests that this happens frequently. Average (trait) differ- ences in behavior are robust, but momentary variation is also substantial (Fleeson & Gallaher, 2009). Much of the research we review in the following sections focuses on trait level differences, and thus addresses the issue of whether people who spend comparatively more time in solitude (introverts) tend to be more or less happy than those who spend less time in solitude (extraverts). This, however, is a slightly different question than whether or not moments of solitude are themselves enjoyable, or whether some people (introverts) enjoy soli- tude more than others – an issue we return to when considering the causes of introversion‐extraversion.

##### A Closer Look at the Links Between Introversion and Happiness

At the broad level of analysis, there is fairly robust evidence that people scoring higher on extraversion report higher levels of happiness; introverts are less happy (Anglim et al., 2020; Diener et al., 2018; Steel et al., 2008; Steel et al., 2019). Among children, temperament dimensions similar to introversion‐extraversion (termed activity and sociability) show similar correlations (Holder & Klassen, 2010), as do actual measures of extraver- sion among adolescents (Steinmayr et al., 2019). The link appears true even among chimpanzees (Robinson et al., 2017). Despite this, our introverted colleagues, friends, and family bristle at the idea. Here we consider their objections and evaluate relevant empirical evidence. Although we ultimately conclude that introversion is indeed associated with lower levels of happiness, our review also provides a more nuanced view of this association.

*Objection #1: happiness measures are biased toward extraverts.* Defining happiness can be tricky, and this objection suggests that the way we assess happiness accounts for its association with extraversion. If happiness questionnaires assess only the exuberance of parties rather than the contentment of quiet walks, they would be biased to a more extraverted form of happiness.

This objection is plausible as happiness is a multifaceted construct (Diener et al., 2018). One part of happi- ness is certainly affective, that is, experiencing many pleasant and few unpleasant emotions over time. Beyond

emotional experience, most happiness researchers also include a more cognitive assessment that things are “going well,” or life satisfaction. At the empirical level, affective and cognitive measures are positively corre- lated but also somewhat distinct. For example, they are sometimes predicted by different variables, and the components change over time with different trajectories (Busseri, 2014; Diener et al., 2010). The combination of hedonic balance (typically including separate indices of positive and negative emotions) and life satisfaction is often termed *subjective well‐being*. This hedonic approach to happiness is sometimes contrasted with a broader eudaimonic approach. In the eudaimonic tradition, psychological well‐being is viewed more broadly to include adaptive personal characteristics, authenticity, and virtue (Huta & Waterman, 2014). For example, Ryff ’s (1989) psychological well‐being inventory assesses autonomy, environmental mastery, personal growth, positive rela- tions with others, purpose in life, and self‐acceptance. Some of these constructs can be understood as predic- tors of happiness (e.g., positive social relationships cause positive emotions), but from a eudaimonic perspective, they can also be valued themselves as part of a virtuous life, independent of the hedonic consequences. Moreover, they are the kinds of things our introverted objectors often mention as more important than “extra- verted happiness.” Cross‐culturally, other valued characteristics can be important, such as how the Japanese‐ based interdependent happiness scale taps people’s sense of quiescence, relational orientation, and ordinariness (Hitokoto & Uchida, 2015).

There are good reasons to think that the association between happiness and introversion‐extraversion might depend on the particular operationalization of happiness, and some widely used measures may indeed favor extraverts. Although there are many ways to organize emotional experience, data reduction techniques typi- cally produce a two‐dimensional model (Bliss‐Moreau et al., 2019; Watson & Stanton, 2017), and these models are widely used in linking personality to affect. This conceptual space is defined by a dimension that distin- guishes pleasant from unpleasant feelings and a second dimension that varies in terms of arousal. A very popu- lar measure of affect, the PANAS (Watson et al., 1988), rotates these dimensions 45 degrees in assessment. Thus, positive affect captures activated pleasant feelings (enthusiastic, excited, alert), whereas negative affect captures activated unpleasant feelings (nervous, upset, irritable).

The PANAS may favor finding an association with extraversion because of the activation component (Smillie et al., 2015). For example, manipulating extraverted behavior in the lab leads most directly to activated pleasant feelings, along with lesser degrees of arousal and merely pleasant feelings (McNiel et al., 2010). Trait extraverts often show increased emotional reactivity to positive incentive mood inductions, but this too appears primarily in activated pleasant feelings (Lucas & Baird, 2004; Smillie et al., 2012). In addition, when asked which emotions they would ideally like to feel, introverts tend to choose lower arousal and somewhat less pleasant emotions (Augustine et al., 2010; Tsai, 2017). Thus, if happiness is defined solely as activated positive affect, introverts may not even want to be happy (at least not as much as extraverts).

Turning to actual experience, trait extraversion, moderates the within‐person correlation between pleasant- ness and arousal (Kuppens et al., 2017). That is, extraverts have a positive correlation between arousal and valence in momentary feelings; for extraverts, the more pleasant feelings tend to co‐occur with high energy feelings. In contrast, for introverts the more pleasant experiences tend to be lower in arousal. These moment‐ to‐moment links between arousal and pleasantness are consistent with correlations between trait introversion‐ extraversion and particular positive emotional states. For example, when modeling the links among big five traits and four distinct positive emotions (contentment, joy, love, and interest), Mitte and Kämpfe (2008) found that extraversion was most strongly associated with joy and least strongly associated with contentment. That said, the correlations were positive in all cases – extraverts reported experiencing more positive emotions, even the low arousal ones. It is worth noting that moments of solitude are associated with lower arousal emotions, both pleasant and unpleasant (Nguyen et al., 2018). This may help explain introverts’ attraction to solitude, even if it does not produce hedonic benefits for them.

Moreover, a major meta‐analysis on personality and well‐being confirms that the pure pleasantness dimen- sion (moderate arousal) is clearly correlated negatively with introversion, but that the magnitude is some- what smaller compared to activated pleasant affect (Steel et al., 2008). In addition, extraversion had a small negative correlation with activated negative affect, suggesting that extraversion might even predict more low arousal positive feelings (e.g., relaxed or content, the pole opposite high activated unpleasant affect in a

circumplex model). Thus, the particular type of pleasant affect seems to moderate the strength of the extraversion‐happiness link, but still no specific pleasant affects favor introversion.

Considering other aspects of happiness (e.g., life satisfaction, meaning), we still fail to find evidence that introverts are happier. For example, our objecting introverts often tell us that they have meaning in their lives, are satisfied, and that this is more important than ecstasy. The data, however, suggest that even on these meas- ures, introverts score lower than extraverts. For example, introverts score lower than extraverts across all scales of Ryff ’s (1989) psychological well‐being inventory and the interdependent happiness scale (Lun & Yeung, 2019; Sun et al., 2018). More comprehensively, meta‐analyses show clear positive associations between extraversion and psychological well‐being and life satisfaction (Anglim et al., 2020; Steel et al., 2008; Steel et al., 2019). Finally, a recent, large replication project confirmed the positive links between trait extraversion and a variety of hap- piness‐related outcomes including subjective well‐being, existential well‐being, gratitude, resilience, inspira- tion, romantic satisfaction, and job satisfaction (Soto, 2019). In sum, we conclude that the association between extraversion and happiness cannot be fully explained by biases in the definition or measurement of happiness.

*Objection #2: extraversion measures are biased toward happiness.* This objection notes that some models/measures of extraversion actually include positive emotions as items or facets (e.g., the NEO Personality Inventory‐ Revised). With this in mind, it is perhaps unsurprising that they correlate with happiness, particularly the emotional facets of happiness. In the extreme form needed to refute the idea that introverts are less happy, this objection suggests that including positive affect confounds measurement, thus obscuring the “true” association. A less extreme form must concede that positive affect is, in fact, a part of extraversion, thus also conceding an association between happiness and extraversion. The strong form is difficult to defend, however, because decades of factor analyses support the idea that people who experience more positive affect also tend to be social, active, and assertive (i.e., they also have the other facets of broad extraversion). Thus, based on the logic of factor analysis alone, we would expect that other facets of extraversion would correlate with positive affect whether it is viewed as part of the broad construct or as a criterion variable. In other words, removing positive affect from a broader extraversion measure should not substantially alter that broader measure’s association with happiness (see Steel et al., 2008, p. 140 for examples).

Turning to the data, it appears possible that a construct akin to positive emotionality could be the common core that links facets of extraversion with subjective well‐being. For example, facets like sociability and asser- tiveness predict life satisfaction considerably worse than cheerfulness, positive emotion, or energy level (Margolis et al., 2020; Sun et al., 2018). Nonetheless, the extent to which positive emotionality is explicitly included in measures of broad extraversion does not seem to influence the overall correlations with happiness very much. For example, a meta‐analysis that explored this issue found very similar correlations between extra- version and happiness when assessing the NEO, which includes a positive emotions facet, and the Eysenck Personality Questionnaire, which does not (Steel et al., 2008). Interestingly, however, the Eysenck Personality Inventory, which differs from the EPQ by including a substantial impulsivity component, tends to correlate with happiness indicators significantly less strongly than the EPQ or NEO. Thus, the particular facets of intro- version‐extraversion can have some influence on the magnitude of the happiness link (see also Anglim et al., 2020; Steel et al., 2019). That said, we cannot conclude that a positive affect *confound* explains the associa- tion. Rather, valid overlap between the constructs of extraversion and well‐being require theoretical explana- tions (as we discuss in a later section).

*Objection #3: introverts are happier in cultures that aren’t so individualistic.* This objection does not fully refute the idea that introverts report less happiness, but it suggests a boundary condition. That is, much of the research on extraversion and happiness is conducted in Western cultures that prize individualism and assertiveness (particularly the United States); the pattern might be different in cultures, such as Japan, that place greater value on thoughtfulness, passivity, and quiet reflection. Furthermore, introverts in individualistic cultures might be happier if people just stopped expecting them to act more extraverted.

Turning to the data, this objection has some merit, but cannot be true in its strongest form. That is, no cul- ture appears to produce introverts that report more happiness than their extraverts. However, cultural differ- ences appear to moderate the strength of the extraversion‐happiness association. For example, a cross cultural comparison found stronger links between extraversion and life satisfaction in North American samples, com- pared to Germany, the UK, and Japan, especially when statistically correcting for response bias (Kim et al., 2018). Similarly, Fulmer et al. (2010) reported that extraversion predicted life satisfaction, positive affect, self‐esteem, and overall happiness more strongly in cultures that tended to have higher levels of average extraversion (e.g., Australia and the U.S. vs. Nigeria and Japan). In other words, having a personality that fits the culture was asso- ciated with higher subjective well‐being. The particular manifestation of introversion might also be important. For example, Chen et al. (2011) found that, among rural Chinese children, shyness predicts happiness, whereas unsociability predicted unhappiness. They explain that the social inhibition of shyness is valued in these com- munities, whereas a diminished interest in connecting with others (unsociability) violates cultural norms. Even within nations, cultural differences exist and change over time. For example, recent data from urban and sub- urban Chinese students found that both shyness and unsociability were associated with problems, but that the unsociability links were much stronger and robust across ages (Coplan et al., 2016; Liu et al., 2017; – see also Chen & Liu, Chapter 6).

Other data suggest that the particular operationalization of happiness might be important. That is, extraver- sion may predispose people to experience high‐arousal positive affect regardless of culture, but the satisfaction that follows might depend on cultural factors (Schimmack et al., 2002). Consistent with this idea, Hong Kong Chinese and Asian Americans seem to value low arousal pleasant affect, whereas Anglo Americans view high‐ arousal pleasant affect as ideal (Tsai, 2017). Although extraverts experience more high‐arousal positive affect across all these cultures, the discrepancy in ideal affect enhances or diminishes overall well‐being. Still, even on a measure of interdependent happiness designed to assess a considerably less extraverted form of well‐being, extraverts scored higher in both the U.S. and Hong Kong (Lun & Yeung, 2019).

*Objection #4: introverts have fewer, but stronger, friendships — enough to create happiness.* This objection assumes that good interpersonal relationships are a primary cause of happiness, and that introverts’ superior relationships cause them greater happiness. We have already reviewed sufficient evidence indicating that introverts are less happy than extraverts, and thus, this objection must be false in its strong form. However, it is worth further considering the links among introversion, social relationships, and happiness.

First, introverts do have friends and do engage in social activities (e.g., Ladd et al., 2011). Moreover, introverts appear to enjoy most forms of socializing as much as extraverts (Sandstrom & Dunn, 2014; Sobocko, 2019; Sun et al., 2019; Wilt & Revelle, 2019). Introverts are not necessarily *shy*; social anxiety is more related to trait neu- roticism. Some unsociable people report that they would prefer having more time alone, suggesting that their social needs are well met (Coplan et al., 2019). On the other hand, despite a professed preference for solitude, introverts also report being lonely more than extraverts (Buecker et al., 2019). Strong interpersonal relation- ships do appear important to happiness. Studies of day‐to‐day life suggest that both the quality and the *quantity* of social interactions are important. A series of studies that coded momentarily sampled audio recordings found that life satisfaction was associated with spending less time alone and more time talking with others (Mehl et al., 2010; Milek et al., 2018). In addition, having more substantive conversations was associated with higher life satisfaction; however, these results did not depend on introversion‐extraversion (i.e., extraverts seemed to benefit as much as introverts from substantive conversations). Similar results were recently reported at the moment‐to‐moment level, where both the quantity and quality of social interactions were correlated with momentary and overall well‐being (Sun et al., 2019). We have already reviewed evidence suggesting that introverts spend more time alone, and thus extraverts likely derive hedonic benefits from their larger quantity of social interaction (Wilt et al., 2012).

It also seems that, contrary to the intuitions of our objectors, extraverts may have higher quality social rela- tionships (i.e., assessed as social integration, social acceptance, social contribution, social actualization, & social coherence; Hill et al., 2012). To be clear, the introversion‐extraversion differences tend to be small when it comes

to quality; other individual differences like trait agreeableness or secure attachment style appear to be more important (Harris et al., 2017; Harris & Vazire, 2016; Noftle & Shaver, 2006). Still, when differences are observed, relationship quality leans against introverts. For example, extraverts tend to be more satisfied with their relation- ships (as with other things), though having an extravert as a partner does not seem to matter very much to rela- tionship satisfaction (Chopik & Lucas, 2019; Dyrenforth et al., 2010; Malouff et al., 2010). In sum, despite some associations, it appears that the *quantity* of social relationships and time spent socializing likely contributes more to the difference between introverts’ and extraverts’ happiness than differences in the *quality* of those social rela- tionships. However, the idea that introverts’ few close relationships are better seems unwarranted.

*Objection #5: c’mon!?! My introvert friend and I are happy.* By this point in our review, the data seem pretty clear: extraverts are happier than introverts. Nonetheless, many introverts seem happy; how can this be? The answer is straightforward: most people are happy, most of the time. Even very disadvantaged people, such as paralyzed “locked in” patients who must communicate using eyeblinks, report a hedonic balance and sense of satisfaction that is above the mid‐point of measurement scales (e.g., Bruno et al., 2011). Moreover, pleasant emotions are by far the most frequent in momentary experience (MacKerron & Mourato, 2013; Trampe et al., 2015). Thus, the research we have reviewed suggests not that introverts are miserable, but simply that they are somewhat less happy than the very happy extraverts. In addition, many other factors beyond trait extraversion predict happiness. As a single predictor of subjective well‐being, extraversion is often described as one of the strongest (Diener, et al., 2018). That said, trait *neuroticism* may be an even stronger predictor, especially for some (un)happiness indicators (Anglim et al., 2020; Steel et al., 2019; Soto, 2019), and the interaction between introversion and neuroticism may further add substantial predictive power (Lynn & Steel, 2006). In sum, most introverts are somewhat happy, but it seems possible that they could become even happier, like their more extraverted friends.

##### *Why* Does Introversion‐Extraversion Predict Happiness?

Understanding what causes differences in introversion‐extraversion and how the trait predicts behavior may also suggest reasons for why the trait predicts happiness. At a broad level, both introversion‐extraversion and happi- ness are quite (though far from completely) heritable, and likely have common genetic sources (Røysamb et al., 2018; Weiss et al., 2008). That is, the same genes may contribute to both personality and happiness. Some theories of extraversion suggest physiological causes that might stem from genetic variations and lead to differ- ences in behavior. Early on, Eysenck (Eysenck & Eysenck, 1985) argued that extraverts were cortically under‐ aroused or less sensitive to external stimulation. Further assuming an optimal level of arousal, he suggested that extraverts’ bold, outgoing, and lively approach to life provided the stimulation they require, whereas introverts’ quieter demeanor helped avoid overstimulation. In this view, sociability is prompted by a need for stimulation, which then results in happiness because socializing is typically fun. More contemporary physiological explana- tions have shifted to dopamine and limbic areas that underlie differences in reward sensitivity and approach motivation (Smillie, 2013). This view goes back to Gray’s (1981) seminal motivational explanations for traits. In essence, the core of extraversion is seen as a propensity to notice and vigorously pursue opportunities for reward, more so than for introverts. This leads to a similarly outgoing and active lifestyle, along with more pursuit and enjoyment of rewards as the path to happiness. In this view, extraverts are drawn to socializing only when it is likely to be rewarding (e.g., soliciting dates, but perhaps not dinner with the in‐laws).

These two views posit different physiology and also mirror two common descriptive or theoretical cores for trait extraversion: sociability vs. reward sensitivity. To this point, physiological research has not been tremendously helpful in adjudicating among the explanations (though did help generate them). The neurosci- ence behind Eysenck’s view is outdated, and there is not compelling case for a sociability center in the brain, let alone one clearly linked to extraversion. The reward sensitivity/dopamine hypothesis remains plausible, but the evidence is mixed and depends on methods (Wacker & Smillie, 2015). Although we know extraversion and happiness are heritable, the strong evidence comes from twin studies, which do not suggest specific physiologi- cal causes. Individual genes are elusive, and when found they each explain tiny amounts of variance and often

fail to replicate (Chabris et al., 2015). As neuroscience progresses, it may inform the physiological bases of extraversion more clearly. For now, behavioral research offers a similarly useful way to clarify the causes of individual differences in extraversion.

The notions that sociability or reward sensitivity are central to the trait of extraversion have also been articu- lated with further distinctions. For example, sociability explanations can distinguish among the frequency of socializing, the affective responsiveness to socializing, the desire for social attention, or the quality of social interactions and bonds (e.g., Ashton, Lee, & Paunonen, 2002; Harris et al., 2017; Oelemans & Bakker, 2014). Similarly, reward sensitivity explanations have ranged from describing an affinity for pleasure broadly to more narrowly invoking clearly *rewarding* pursuits (e.g., winning, money, sex vs. leisure; see Oelemans & Bakker, 2014; Smillie et al., 2012; Zelenski & Larsen, 1999). Although not typically invoked as a core characteristic of the trait, extraverts’ happiness could also result from positive biases in high‐level cognitive processes (e.g., opti- mistic interpretations, memories, and judgments; Zelenski, 2008; Lay et al., 2017). Extraverts also seem to use mood regulation strategies more effectively and better maintain induced positive moods over time (Hemenover, 2003; Kämpfe & Mitte, 2010). As noted earlier, cultural factors, such as social pressures, stigma, and subtle discrimination might contribute to introverts’ lower well‐being, particularly in more extraverted societies (Cain, 2012; Lawn et al., 2018). Finally, extraverts may simply have a more positive setpoint, prone to greater happiness almost regardless of circumstances (Mueller et al., 2019).

Behavioral research has not been more successful than neuroscience in definitively favoring one explana- tion over the others, and most explanations are not mutually exclusive. For example, positive cognitive biases are often described as developing through a history of pleasant experiences, perhaps rooted in reward sensi- tivity. Still, behavioral studies have provided more and less support for some views, and when considered collectively make it hard to argue strongly that only one will fully explain the robust link between extraver- sion and happiness.

Supporting the reward reactivity view, laboratory studies – which ensure that the situation is equal for all participants – find that extraverts often report larger boosts in response to positive emotion inductions (Smillie et al., 2012). This suggests that something internal (like a sensitive reward system) amplifies the positive emo- tional response for extraverts. However, the mood induction effects have been somewhat inconsistent and obtained more reliably for rewarding stimuli, compared to merely pleasant stimuli (e.g., vignettes about win- ning money vs. comedy videos), thus prompting the narrower focus on reward. It is difficult to test reward responsiveness outside the lab because introverts and extraverts spend time in different kinds of situations and/ or may interpret them differently in self‐reports. Nonetheless, a recent day reconstruction method study found that trait extraversion was associated with more positive affect during activities deemed rewarding (e.g., work- ing for pay and sports) but not for most activities that were merely pleasant (e.g., watching TV, shopping, relax- ing; Oerlmans & Bakker, 2014).

Day reconstruction (DRM) and experience sampling (ESM) studies have also been useful in revealing how socializing might contribute to extraverts’ greater happiness. Extraverts clearly spend more time socializing, and social activity tends to be positive (Breil et al., 2019; Mueller et al., 2019; Sherman et al., 2015). Across a few ESM and DRM studies, time spent in social situations partially mediated the association between trait extraversion and happiness (Lucas et al., 2008; Mueller et al., 2019; Oerlemans & Bakker, 2014; Srivastava et al., 2008). This suggests that extraverts might be happier, in part, because they socialize more; however, the studies provided considerably less support for the idea that extraverts experience larger mood boosts from socializing than introverts. The lack of greater social reactivity among extraverts again suggests the nar- rower focus on reward reactivity vs. generally positive things. One study simultaneously considered both social and rewarding activities in day‐to‐day life, but still did not fully account for extraverts’ greater happi- ness; thus, it seems plausible that extraverts also have a higher happiness setpoint (Oerlemans & Bakker, 2014). Finally, these sociability studies are correlational, so it remains plausible that positive emotions (from reward reactivity or a high setpoint) might actually cause the socializing, rather than the other way around. Indeed, experimentally inducing positive moods seems to create feelings of sociability and preferences for social situ- ations (Whelan & Zelenski, 2012a). Still, the causal path from socializing to positive affect is also supported by experimental work (Fleeson et al., 2002; Zelenski et al., 2012).

Such findings beg the question: what accounts for momentary sociable (or extraverted, more broadly) behav- iors? Indeed, contemporary personality theory has become increasingly concerned with understanding the moment‐to‐moment variations in behavior as much as the regularities (traits) that clearly emerge when those moments are aggregated over time (Fleeson & Jayawickreme, 2015). Individual differences like reward sensitivity could still play a role, but then they must be understood in conjunction with situational affordances. Contemporary theories more typically invoke narrower cognitive and motivational processes; this approach then also allows for behaviors that seem to contradict dispositional tendencies (Little, 2014; Mischel & Shoda, 1995). For example, both dispositional introverts and extraverts act in extraverted ways when they are trying to entertain someone, make a positive impression, or be a leader (McCabe & Fleeson, 2012). Moreover, in both lab and experience sampling studies, dispositional introverts and extraverts experience positive affect when behaving in extraverted ways (Fleeson & Law, 2015; Wilt et al., 2012; Zelenski et al., 2013). Similar to the lack of evidence for social reac- tivity, extraverted disposition does not appear to moderate this effect –virtually everyone enjoys acting like an extravert (i.e., bold, spontaneous, assertive, talkative, active). Hence, from this perspective, dispositional extra- verts are happier because they act extraverted more often. Conversely, introverts spend more time alone, which tends to be associated with poorer moods (Reis, O’Keefe, & Lane, 2017; Sobocko, 2019).

##### Increasing Introverts’ Happiness

It is clear that dispositional introverts regularly behave in extraverted ways (even if somewhat less than extra- verts do), and that introverts enjoy these moments. Might it then be possible for introverts to become happier by increasing their extraversion? Although traits and their links with happiness are fairly stable over time, there is some nontrivial change too (Anusic & Schimmack, 2016; Ferguson, 2010). Moreover, changes in trait extra- version seem to precede changes in happiness over years (Boyce et al., 2013; Fetvadjiev & He, 2019; Hill et al., 2012; Soto, 2015). In particular, psychotherapy (broadly) seems to increase trait extraversion (Roberts et al., 2017), and a recent study found that motivated people were successful in increasing trait extraversion if they worked through 15 weeks of exercises (Hudson et al., 2019).

Of course, it is possible (and intuitive) that some costs mitigate the happiness benefit of acting extraverted for dispositional introverts, but these costs have been elusive in empirical work. For example, when instructed to act extraverted, introverts do not experience concurrent negative affect, show indications of self‐regulatory depletion (Zelenski et al., 2012), nor report greater effortfulness (Gallagher et al., 2011). Trait introverts even report feeling more authentic when they behave extraverted compared to when they behave introverted (though only if you ask them in the moment; they retrospect the opposite; Fleeson & Wilt, 2010; Whelan & Zelenski, 2012b). Even in the contexts where introverts experience hedonic benefits of extraverted behavior (e.g., social lab studies), they still predict that it will be unpleasant beforehand (Zelenski et al., 2013), a phenom- enon that also extends to trait extraverts in some “talking to strangers” contexts (e.g., public transit, Epley & Schroeder, 2014). It may take extended periods of extraverted behavior to tire people, yet this fatigue may also extend to dispositional introverts and extraverts alike (Leikas & Ilmarinen, 2017).

Recently, a handful of studies tested the effects of asking participants to behave in more extraverted ways in their day‐to‐day lives ( Jacques‐Hamilton et al., 2019; Margolis & Lyubomirsky, 2020; van Allen et al., 2019). On balance, the results generally mirror lab and experience sampling studies’ suggestions. That is, intentionally acting extraverted over the course of a week does seem to be associated with increases in positive affect, well‐ being, and even authenticity, compared to control conditions or instructions to act introverted. However, the particular instructions, comparisons, and results differed somewhat across these studies, and it is clear that more research is needed before an efficacious and widely usable “acting extraverted happiness intervention” exists. For example, Jacques‐Hamilton, Sun and Smillie (2019) found that the benefits of acting extraverted were not present for people who were very dispositionally introverted, but most other studies have not found interactions with disposition. van Allen et al. (2019) found that instructions emphasizing either the social *or* adventurous aspects of extraversion were equally effective, thus suggesting that socially anxious introverts might still find benefits in completely nonsocial versions of extraverted behavior (e.g., a solitary dance party, mountain biking, exploring a new place).

##### Conclusion

In sum, it is clear that extraversion predicts happiness. Although the strength of this association depends some- what on how happiness and extraversion are defined, the general link remains robust. Many potential explana- tions for extraverts’ higher happiness exist, and it seems likely that more than one could be correct. Future research will be useful in further developing these process explanations. At present, social participation, reward reactivity, set point, and mood maintenance views are all somewhat supported. There is less support for the ideas that extraverts fit social situations better or enjoy social situations more than introverts. In fact, virtually everyone seems to enjoy socializing more than spending time alone. This truism is also consistent with the trend toward more contextualized person x situation social‐cognitive approaches, that is, understanding when and why people choose extraverted behaviors in the moment.

Finally, as much as extraversion, both as a trait and momentary behavior, seems to promote positive affect, we also recognize that there are other important things in life, and other “trade offs” that come with being more or less introverted. For example, introverts appear to more easily regulate their behav- ior; extraverts suffer cognitive and emotional deficits when asked to act introverted (Gallagher et al., 2011; Zelenski et al., 2012). Taking an evolutionary perspective, Nettle (2006) suggests that extra- verts benefit from having more sexual partners and exploration than introverts, but that they also suffer because of their risks (e.g., with injuries, family instability). Some facets of extraversion can be prob- lematic in the workplace (Wilmot et al., 2019), and extreme forms of extraversion are associated with personality disorders (Soto, 2019). Our purpose here is to acknowledge via a few examples that being extraverted is not necessarily better than being introverted. Extraversion is, however, generally more conducive to happiness, and thus trait introverts might seriously consider adding a little more extraverted behavior to their days.

# Solitary and Social Aspects of Restoration in Nature

In the environmental psychological literature, the term *restoration* refers to the process of renewing, recovering or reestablishing physical, psychological and social resources or capabilities diminished in ongoing efforts to meet adaptive demands (Hartig, 2004). Those environments that permit or promote restoration after being in another, more demanding environment are referred to as restorative environments (Hartig, 2004). Demanding environments may include crowded and noisy urban settings where psychophysiological stress and attentional fatigue accumulate and make proper functioning difficult. Positive outcomes in restorative environments such as tranquil parks and forests may include physiological relaxation, positive emotions, and recovery of atten- tion‐demanding cognitive performances (Berman et al., 2008; Hartig, 2004; Hartig et al., 2003; Ulrich et al., 1991). Thus, restorative as well as taxing or demanding processes may take place more likely in some activities and environments than in others (Hartig, 2004).

In the restorative environments literature, as well as in theories of emotion‐ and self‐regulation, it is assumed that, in general, people tend to avoid settings or situations where undesired emotions may become activated and choose settings or situations where desired emotions are more likely (Campos et al., 2004; Caspi et al., 2005; Tesser, 2002). Similarly, a process model of emotion regulation refers to *antecedent focused regulation*, which pertains to situation selection and situation/environment modification where a person approaches, avoids, or modifies situations or environments on the basis of their likely emotional impact (Gross, 1998). The concept of *environmental self‐regulation* covers this idea and refers to the use of specific places or, more generally, socio‐physical settings, in the service of affect and self‐regulation, such as visiting a nearby favorite place in a natural setting to calm down (Korpela et al., 2018).

Restoration may require seeking a solitary environment, where privacy can be realized. In this context, it has been presented that privacy regulation, place identity, attachment to favorite places, and restorative outcomes might be interrelated phenomena within self‐regulation and emotion regulation (Korpela, 2002). Solitude and opportunities for reflection in non‐distracting circumstances and positive emotional outcomes have been men- tioned with a noticeable frequency in *favorite place studies* (Korpela, 1992; Korpela & Hartig, 1996; Newell, 1997). In these studies, people report experiencing relaxation and positive emotions, becoming able to clear their minds, getting things in perspective, and coming to terms with troubles in pleasant natural settings that often pose no immediate social demands. Thus, after emotional or cognitive stress, solitude and being alone with nature is considered a desirable state with positive effects. It is these phenomena that we address in this chapter, acknowledging that striving for restoration may imply privacy regulation that includes both solitude/intimacy and the company of other people.

##### Restoration Studies Using Individuals and Small Groups as Participants

At the individual level, restoration involves physiological recovery and relaxation, change to positive self‐ reported emotions, and recovery of the ability for attention‐demanding cognitive performances (Hartig et al., 2003; Parsons et al., 1998; Ulrich et al., 1991), after the exposure (watching or walking) to the natural environment (usually an urban park or a forest), and following negative antecedents such as stress (Ulrich et al., 1991) or attentional fatigue (Kaplan & Kaplan, 1989) (see Table 23.1 for examples of these studies; for meta‐analyses, see Menardo et al., 2019; Mygind et al., 2019). Thus, there are two dominant theories of resto- ration (attentional and psychophysiological) that focus on somewhat different psychological processes. However, these theories are complementary and the psychological processes involved can be seen as the dis- tinct but interacting benefits of restorative experiences both theoretically (Kaplan, 1995) and operationally (Hartig et al., 2003).

Examples of the various benefits indicating restoration are as follows. Decrease in heart rate, muscle tension, and skin conductance (Ulrich et al., 1991, watching videos individually), lower blood pressure and improved mood (Hartig et al., 2003, walking in real environments with an assistant avoiding conversation; van den Berg et al., 2003, watching videos with 8–10 noninteracting participants), decrease in salivary cor- tisol after observing a natural setting (Park et al., 2007, walking and sitting in real environments individu- ally), and better attentional performance (Berman et al., 2008, walking in real environments and watching pictures individually; Faber Taylor & Kuo, 2009, children walking in real environments with an assistant avoiding conversation). These restorative environments experiments have been carried out with single/ solitary participants, participants accorded with a research assistant, or with small groups of non‐discussing people, and all these designs have yielded positive results. Although there are no systematic studies evaluat- ing the potential effect of these slightly different social contexts on restoration, the findings are meant to be generalized to solitary urban people experiencing nature. These studies mostly refer to adults, however, to give a more complete account in this chapter, we distinguish different phases of the life span and describe each separately. Thus, we inspect the relation between restoration, solitude, and natural environments in the following sections, separately for children, adolescents, and adults. Before that, we describe develop- mental trends (starting from childhood) of privacy‐, emotion‐, and self‐regulation (which helps to under- stand restoration in solitary natural settings as a particular aspect of emotion‐ and self‐regulation). In the end, we inspect the role of social context in restoration.

##### Private Spaces in Childhood and Adolescence

Developmentally, the availability of privacy is closely related to the achievement of self‐identity and self‐ esteem (Laufer & Wolfe, 1976; Newell, 1994). Personalization of private spaces provides children and adoles- cents with tangible signs that they are unique and different from others (Sobel, 1990). Children highly value having a room of their own that they can name as the primary place where they feel most at home, that they can personalize, and where they retreat when they are upset or want to be undisturbed (Chawla, 1992). In an

observational study with children aged 1–11 years, Weinberger (2006) showed that nearly half of the children used (often solitary) informal *retreat* places in their family homes. Retreats were places where a child sponta- neously chose to go in order to pull away from the activity of the group. Children observed to be in a negative mood were likely to be involved in passive behaviors (watching others, crying, cuddling comfort objects) dur- ing their retreat.

Similarly, Smith and Barker (2000) found that 5‐to‐12‐year‐olds frequently used den‐making as a means of creating a private place in a large room outside the range of the gaze of adults in out‐of‐school clubs in England and Wales. Harden (2000) reported that many Scottish youth ages 9–15 years also indicated that they experi- ence their home and neighborhoods as safe and private havens. Feelings of insecurity (e.g., being afraid of intruding thieves) were most keenly felt at night or when alone at home. The neighborhood was not associated with the same level of safety as home because it included various public areas (e.g., railways, parks) where interfering adults or teenagers were considered as potential risks.

Violating children’s needs for privacy seems to result in either psychological withdrawal or aggression, depending upon the duration of the crowding period and children’s individual characteristics (Maxwell, 1996). Maxwell’s (1996) study of 3–5‐year‐old children in the United States found that children chronically exposed to high density at home and in childcare were more susceptible to behavioral disturbances such as aggression, anxiety, and hyperactivity.

In conclusion, the positive emotional outcomes related to the availability of private and favorite places sug- gest that there are relations among privacy regulation, restoration, and self‐regulation in children (cf. Newell, 1997; Korpela et al., 2001). Indeed, adults and children provide converging self‐report evidence that emotion‐regulation and self‐regulation do occur in the favorite places of childhood and adolescence. Studies of adults’ memories of childhood favorite places (Cooper‐Marcus, 1978; Hester, 1979; Sobel, 1990) indicate that they provided the feelings of security, privacy, and control. The need to be alone, the importance of hiding places (often in nature), and the need to escape from social demands are commonly reported in these studies. Findings from studies with children and adolescents corroborate the significance of both solitary places and social places (Abbott‐Chapman & Robertson, 2001, 2009; Green, 2011, 2018; Owens, 1988, 1994). Ethnographic observations and interviews in green school grounds in the US showed that natural areas served not only as places where 6–18‐year‐old students could find refuge from stress – often solitary – but also develop protective, supportive social relationships in cooperative activities, play, and learning (Chawla et al., 2014).

##### Restorative Experiences, Solitude, and Social Relationships in Natural Favorite Places

Experiences of restoration and solitude and their regulation are considered here as developmental phenomena, and we thus provide separate treatment for children and adults (cf. Laatikainen et al., 2017). Much less is known of children’s than adults’ experiences. However, as particular aspects of self‐regulation, the temporal experi- ences of relaxation and reflecting on matters of personal importance in natural settings commonly appear in studies based on both children’s, adolescents’, and adults’ accounts.

*Children and adolescence.* Among Finnish and Estonian youth, 9‐, 12‐ and 17‐year‐olds have described their favorite places (i.e., their rooms, places in nature) as providing opportunities not only to enjoy many activities and play socially but also to clear their minds, relax, and “pour out troubles” (Korpela, 1989; Sommer, 1990). Adolescents in the US reported that natural parks and undeveloped agricultural land were some of the best types of places to get away from other people, to go to feel better, and for getting things in perspective (Owens, 1988). In another study of US adolescents, natural environments were found to provide important settings for psychological comfort, respite and relaxation, aesthetic experiences, being with nature, and the opportunity to be alone or share the solitary experiences with close friends, often in places where they can look around while feeling protected (i.e., prospect refuge) (Owens & McKinnon, 2009). On the other hand, favorite places located in city environments appear to interact with peer risk behaviors influencing substance (cannabis) use behavior of 13–14‐year‐old urban adolescents (Mason & Mennis, 2018).

In an Australian study of 14–19‐year‐olds, favorite places at home or in nature (in the country, by the river, or at the beach) were particularly associated with adolescents’ need to “take time out” from people and things that bothered them (Abbott‐Chapman & Robertson, 2009). The most important reasons reported for the choice of a natural favorite place were participating in activities (32%), seeking peace, quiet, and sense of space (30%), as well as relaxing, being carefree, and seeking freedom (13%). These activities were carried out alone or with friends.

Finnish 17‐to‐18‐year‐olds reported going to their solitary favorite places (mainly their own room or a sum- mer cottage) after emotionally negative events that threatened self‐esteem and the coherence of the experience of self (Korpela, 1992). Being alone at the summer cottage helped them to clear their mind and feel the courage to be themselves. Over half (55%) of Finnish youth (aged 8–9 or 12–13 years) reported using their favorite places for cognitive restoration – describing a desire to come to terms with troubles, reflect on personal mat- ters, to clear one’s mind, and feel free and relaxed in the favorite place (Korpela et al., 2002). One‐third of the children reported using their favorite places for emotion‐regulation, visiting the favorite place after setbacks, disappointments, and feeling down and lonely.

Finally, when asking the frequency and reasons for green space visits in general, a Dutch study found that 53% of the 17‐year‐old adolescents visited green spaces at least once a week in summer, mostly for physical and social activities (Bloemsma et al., 2018). Boys visited green spaces more often for physical and social activities than girls and adolescents who owned a dog were 1.5 to 1.7 times more likely to visit green spaces at least once a week to experience nature and quietness. Thurber and Malinowski (1999) found that 8–16‐year‐old boys with higher levels of negative emotion were more likely to favor places where they could be alone while attending a residential summer camp in rural New Hampshire (United States), whereas happier boys favored places where they could socialize. The camp contained a variety of natural (an old white pine grove, mixed forest, lakefront, a meadow, wetlands, beaches, and a small island) and built environments (cabins, a dining hall, tennis courts, soccer, volleyball and baseball fields, boating and swimming docks). Boys with higher levels of negative emotion were also more likely to visit new places at camp than their less distressed peers. An example of poten- tial for anger management via physical environment comes from an interview study where adolescents reported that leaving the social scene during a quarrel, such as going for walks or to their room and engaging in distract- ing activities was a means of managing anger (Keiley & Seery, 2001).

Thus, favorite places appear to provide emotional release, restorative experiences, and possibilities for reflec- tion in non‐distracting circumstances, being alone or with important others. These results suggest that favorite places are used to regulate not only the experience of self (self‐identity, self‐esteem, Korpela, 2002; Owens & McKinnon, 2009) but emotions (particularly negative emotions) as well. Studies on adults’ experiences (under- neath) corroborate and further specify this interpretation.

*Adults.* Among adults’ favorite places, everyday natural settings (e.g., parks, beaches, forests) typically constitute the largest category (50–63%) – as demonstrated in studies from the UK, Sweden, Finland, Ireland, Senegal, and the United States ( Jorgensen et al., 2007; Knez, 2006; Korpela et al., 2001; Newell, 1997). Concerning associations between solitude, restoration, and nature, results from self‐report studies in different regions in the US indicate that people report a sense of remoteness or isolation as important in their “special” outdoor places, which may include unmanaged forest, savanna, prairie, meadows, and shoreline settings, as well as designed parks and gardens (Schroeder, 2002). Respondents reported the sense of being away from the civilized world (even in places close to populated areas), entering a whole different world from the usual daily life, escape and solitude enabling them to relax, refresh, meditate, reflect, and experience a sense of peacefulness within themselves. In a more active interaction with nature, people reported excitement, exploring, making discoveries and being surprised by new things (Schroeder, 2002). Similarly, a Google Maps‐based online Dutch survey found “peace and quiet,” “exploration,” and “peak experiences such as awe or timelessness” as main classes of the reasons for the place’s attractiveness, when respondents were asked to mark a nature area they find most “attractive, valuable or important” on a national map of the Netherlands (Davis et al., 2016). There is no information of the relative importance of solitude in this study, but nature not only as a source of relaxation but also as an incentive to exploration and to strong, positive emotional experiences is evident.

In an Australian, female and high‐education dominated survey sample, 447 respondents were asked to iden- tify their favorite outdoor places and explain what they loved about those places (Schebella et al., 2017). The most frequently listed favorite places were “nature parks” such as conservation reserves and National Parks (39.5%). The second most frequently listed favorite places were “private green spaces” such as backyards (14.5%) and “botanical gardens and arboreta” (14.5%). Overall, the five most loved attributes of favorite places were birds, plants, aesthetics, wildlife, and walking. Among the twenty most loved attributes of natural favorite places, 19% of the participants mentioned solitude and privacy which overall ranked as the seventh important attribute. Quiet and tranquility ranked eighth and rest and relaxation seventeenth. As family relations ranked only nineteenth, mentioned by 9% of the participants, the results echo the importance of natural favorite places for solitude and relaxation for adults.

In general, cross‐sectional self‐report studies do indicate that natural favorite places provide restorative, stress‐alleviating experiences such as relaxation, decrease in negative feelings and increase in positive ones, for- getting worries and that people visit these places often alone for the regulation of their self‐experience and feelings (Gross & Lane, 2007; Jorgensen et al., 2007; Korpela et al., 2001; Newell, 1997; Smaldone et al., 2005). Restorative outcomes (i.e., being relaxed, forgetting worries, and contemplation) have characterized visits to natural favorite places in particular (Korpela et al., 2001). A Norwegian study among wilderness visitors found that a need for positive feelings and for regulating negative emotions in nature was positively related to restora- tive outcomes, such as relaxation and clearing one’s thoughts after a visit to a natural area ( Johnsen, 2013). Adults with high negative mood are more likely than those with lower negative mood to choose *natural* favorite places over other favorite places (e.g., sports, commercial, or community service settings) (Korpela, 2003). Moreover, adults with a greater number of health complaints are more likely than those with fewer complaints to choose natural favorite places in the vicinity over other favorite places (Korpela & Ylén, 2007). More impor- tantly, and in support of the process of self‐regulation, adults with more health complaints also appear to ben- efit more in emotional terms from their visits to these natural favorite places as compared to adults with fewer complaints (Korpela & Ylén, 2007).

These findings refer to a *dose‐response* relation between the frequency of visiting a favorite place and restorative experiences. This has been further demonstrated in a five‐day diary study in which the increase in the frequency of favorite place visits increased the strength of restorative experiences (Korpela & Ylén, 2009). Moreover, evidence of momentary improvement of stressed mood and also the continuation of positive mood while in the favorite place has been presented (Korpela, 2002, 2003; Regan & Horn, 2005).

Interestingly, there is at least some evidence to suggest that spontaneous place choices to implement restora- tive coping strategies are related not only to the amount of stress, but also to the sources of this stress. Gulwadi (2006) reported that more elementary school teachers with high‐frequency vocational stress (vs. home‐related or interpersonal stress) mentioned natural settings as restorative places than did a comparison group of low‐ frequency vocational stress teachers. In contrast, teachers with high‐frequency interpersonal stress were most likely to seek places providing social contact.

In addition, other benefits may arise from contact with nature: A Dutch walk‐along interview study indi- cates that wildlife experiences in a favorite green place near home may contribute beyond stress‐alleviation, i.e., to strengthening a person’s identity, getting a sense of being privileged by the place, and through repeated visits to a sense of being part of nature’s cycles and flows, feeling the essence of existence (Folmer et al., 2018). These types of experiences of nature have been noticed also previously in the concept of environmental self‐ regulation (Ratcliffe & Korpela, 2018) and have been included in categorizations such as nature as “restorer,” “competence builder,” “symbol,” and as “diversion” (Knopf, 1987).

To summarize, in studies on adults’ self‐reports, we observe evidence for the perception of restorative potentials (e.g., sense of being away) in natural settings and the process of using these places in solitude for self‐ and emotion‐regulation according to the source and type of stress. Furthermore, the perceived frequency of use of environmental strategies in regulating affects has been positively related to perceived health (Korpela et al., 2018).

##### The Social Context of Restoration

People are social creatures. The need to belong (Baumeister & Leary, 1995), to compare (Festinger, 1954), or to become part of groups (Ellemers, 2012) are all inherent to the human race. It follows that transactions with the physical world reflect the social meaning these environments can have. This will also apply to environments used for restoration and the judgment of places as restorative environments. In a very influential chapter, Wohlwill (1983) analyzed why natural environments are usually considered restorative. It was suggested that it was the absence of social feedback and, therefore, the absence of the need to adapt our responses to others’ previous responses, which may allow for restoration. To date, this assertion has not been formally empirically evaluated. However, it seems to be echoed in the results of some empirical work on the social stress experi- enced by city dwellers (Lederbogen et al., 2011). Using fMRI techniques, Lederbogen et al. demonstrated that, compared to participants living or raised in small towns or rural areas, those who lived or were raised in cities experienced more stress induced by negative feedback while working on a cognitive task. A more recent study (Haddad et al., 2015) specifically points at the effect of growing up in cities on schizophrenia. In this regard, living in high population densities may come at a cost, as already suggested in the early social psychological work on urban environments (e.g., Milgram, 1970). The question then becomes how people want to manage the opportunities they have for restoration, in particular whether they want to be with other people, with which people, and in what kind of ambience.

A useful initial distinction in reviewing the literature pertaining to the social context of restoration is to compare situations that include people who are intimate with the individual seeking restoration – versus the generally anonymous group of other people who happen to be in the same environment as the individual.

*Company of intimates.* Results from the few studies that have paid explicit attention to the social context of restoration show that social support can make a situation more restorative, and that the company of friends can serve multiple functions, conducive or not conducive to restoration. The way that social company can make a situation more restorative can be explained by the enablement or enhancement of restoration (Hartig, 2004). For example, enablement can be based on the concern for safety. In this regard, having company while visiting a natural environment may help a person to feel safe. Feelings of unsafety may arise from dealing with the difficult and dangerous passages of the terrain, encountering wild animals, or lack of orientation (Bixler & Floyd, 1997, Coble et al., 2003; Kaplan & Kaplan, 1982). Thus, the presence of another can be a safeguard against getting hurt or lost.

More prevalent than dangers arising from the terrain, however, may be dangers anticipated to come from other people. The danger of molestation or robbery, especially in places where little social control is executed, constitutes a fear that is widely held, especially among women (e.g., Day, 1995; Nasar & Jones, 1997). A sense of this danger could prevent people from going to environments that they would otherwise consider attractive for restorative purposes. Having company may be the critical enabling factor in going to places where one would feel unsafe alone. A somewhat similar effect of social support that may facilitate restoration is described by researchers on ego deple- tion (Baumeister et al., 1991). They mention the importance of the *ego cast*, the support provided by familiar others to protect a person from demands that he/she is not capable of handling in a state of depletion.

Given unproblematic access to an environment, company may enhance or degrade the restorative quality of a person’s experience. In general, there is abundant research evidence indicating that people like to interact frequently with those with whom they share a stable and enduring affective bond (Baumeister & Leary, 1995). Enjoying the company of others during outdoor recreation presumably also depends to some extent on the mutual appreciation of the given environment and the activities that it supports. This may appear as a positive effect of company on preferences for environments that cannot be attributed to enablement through increased safety (see Kaplan & Kaplan, 2011). On the other hand, the presence of another person may degrade the qual- ity of the restorative experience by, for example, compelling the person to pull their attention from the physical environment (cf. Kaplan, 1995, Staats, 2012). This may appear as a negative effect of company on preferences for environments, also independent of increased safety.

In a series of studies, we looked at the effects of different leisure environments and social context – being alone versus being with a friend – on the restorative potential of the complete situation. Staats and Hartig (2004) manipulated mental fatigue and the company of a friend through the use of scenarios. Subsequent pref- erences for a natural and an urban environment were investigated. Company was preferred in the urban envi- ronment but appeared not to contribute to preference and to the restorative potential of the natural environment. Looking closer at the natural environment results, we found two effects that were opposite in sign. It appeared that company indirectly *increased* perceived restorativeness via its effect on safety – while simultaneously demonstrating a direct *negative* effect on perceived restorativeness.

These complex findings were replicated in a field study that looked at the effects of walking in company ver- sus walking alone in a park or an urban environment ( Johansson et al., 2011). The presence of company had a stronger effect on restoration during a walk in an urban setting, but being alone had stronger effects in a natural setting. Similarly, results from a third study again demonstrated that company of a friend has effects that are highly dependent on setting. In a scenario study, Staats et al. (2010) compared the restorative potential of four different types of settings (home, city center, urban park, transit environments). For each setting, participants imagined being in company or alone, as well as mentally fatigued or rested. Strong interaction effects were found, indicating that preference depends on specific combinations of person‐environment characteristics. Most notably, the preference for an urban park was higher when participants were mentally fatigued and alone as compared to being alone and rested or being fatigued and in the company of a good friend. Urban nature was the only setting where preference for being alone was so pronounced when fatigued (Staats et al., 2011). In a recent multinational study, replicating and extending these results (Staats et al., 2016), one of the outcomes was that, in an urban park setting, company was not preferred over being alone, while strongly preferred when sitting in a café or walking in a shopping mall.

*Presence of Unknown Others.* Solitude is no longer easy to achieve in a world whose population grows increasingly fast and where the means of transportation and communication make the encounter of others a common experience. This implies that restorative experiences, in built but also in natural environments, will usually take place in a context where strangers are actually present, or can be expected to be present shortly. How do people deal with this phenomenon? The literature that specifically addresses the psychological consequences of interacting with large numbers of anonymous strangers is not optimistic about its consequences to restoration. Previously mentioned is the “no feedback” hypothesis (Wohlwill, 1983) as one of the “charms” of nature. It seems likely that the encounter of (many) strangers in nature will be negatively evaluated by a person in need of restoration and will interfere with actual restoration. However, hardly any research exists on this specific topic. Contrary to our hypothesis, empirical work suggests that the presence of unknown others in natural environments has no effect on the evaluation of the environment or on restoration. A study by Cole and Hall (2010) describes the experiences of recreationists on trailheads that were heavily (100–300 visitors per day) or moderately (0–100 visitors per day) used. Scores for the decrease in self‐reported stress and mental rejuvenation were similar across the trails. The number of groups of other recreationists that participants met on the trail was not related to restoration. Despite the limitations of the study – the authors point out that complete solitude was never experienced by their participants – they conclude that restoration can hardly be an argument to strongly limit visitors’ access.

These inconclusive results are to some extent complemented by experiments that are currently being exe- cuted in Leiden in a research program on the social aspects of restoration. In one experiment (Konings, 2012), one trail through a forest was simulated by identical photographs except that the three sequences representing three conditions showed either no people, some other people (4 images with people in a total of 44 slides), or many people (18 images with people in a total of 44 slides). These simulated trails showed differences in the preference and likelihood of restoration scores. There was a marginally significant interaction effect suggesting that participants who were made mentally fatigued (by a cognitively demanding 50‐minute intelligence test), compared with participants who were rested, considered the walk without people more pleasant, and the walk with few or many people less pleasant, contrary to the rested participants (see Figure 23.1).

For other experiments, an interactive research paradigm was developed in which participants, after a fairly intense stressful experience were virtually taken along a path through a forest where they had to make a deci- sion to continue along a branch of the path where another person was walking or a branch where no one was. We looked at the choices people made and the consequences for their evaluation of the walk and feelings of restoration (see Figure 23.2). In two experiments participants generally favored the empty path over the path with a person, with percentages of 75% and 60%, (Konings & Staats, 2015; Kessels, 2016). Interestingly, choos- ing for the encounter was not detrimental for reported restoration as scores of these groups were similar or even higher than for the groups who had chosen the empty path. Initial explanations focused on personality characteristics and normative considerations: implementing a social anxiousness measure (LSAS, Liebowitz, 1987) confirmed that socially anxious people more often chose the empty path. In addition, norma- tive considerations seemed to affect choices as well. On the one hand, considerations of privacy violation were experienced: people felt that other person’s privacy on the forest path should not be intruded, and therefore avoided the path with person; on the other hand, participants experienced an explicit choice of not choosing for the encounter as an implicit rejection and thus as impolite behavior. These preliminary results are now are being finalized for publication (Staats, 2019).

*Presence of both known and unknown others.* Other research (Staats et al., 2011) has pointed at other motives to be with a friend: participants who were fatigued while visiting a busy city center preferred being with a friend over being alone, in a situation where safety was unlikely to explain this preference. A potential explanation could be the sociability norm, prescribing that one should not be alone in a public setting (Bourdieu, 1984; Lofland, 1998). We also studied the combination of both a friend and unknown others in experiments in which participants chose a seat in a café (Staats & Van der Jagt, 2020). Scenarios described participants to be mentally fatigued or rested and to be alone or with a friend. Then, a floorplan of a café was shown in which all tables were partly

occupied. Two conditions showed either a café with only a number of identical tables, the other condition showed the same tables but also included a reading table (see Figure 23.3).

The reading table‐condition was strongly preferred in seat choices and in preference and restorativeness rat- ings over the tables‐only condition, but mainly for people alone and for those who had received the mental fatigued induction. The results imply that people in company of a good friend were not sensitive to the privacy intrusion experienced by the people alone, especially those who also felt mentally fatigued. Apparently, in social settings, the company of a friend also serves as a buffer against the violation of privacy and people alone are less able to handle such intrusions. When a person visits a café alone, very subtle differences between seats may determine choice, based on privacy considerations (Staats & Groot, 2019).

##### Conclusions and Future Directions

After emotional or cognitive stress, being alone with nature is restorative for urban citizens of different ages. People experience physiological recovery, positive emotions, become able to clear their minds, and deal with troubles in pleasant, natural settings that often pose no immediate social demands. Thus, it is tempting to think that an easy access to appealing natural settings in urbanized environments promotes peoples’ ability to cope with modern‐day stress and uncertainty. Indeed, contacts with nature have been presented as a new precaution- ary means of general health promotion (COSTE39, 2007; Maller et al., 2005). However, longitudinal studies about the health or well‐being effects of solitary retreats to nature are nonexistent. We also know very little about the individual or cultural differences in these restorative nature‐experiences. An exception is a study indi- cating that physiological restorative benefits in nature may depend on a psychological mind‐set of admiring and appreciating nature and beauty (Olafsdottir et al., 2017). Moreover, it has been shown that personal motives and attentional focus are connected to the outcomes of nature visits – the motive to be alone was directly con- nected to lower positive emotional well‐being, whereas indirectly, via increased focus on one’s own thoughts, it was consistently associated with a more positive post‐visit mental state (Pasanen et al., 2018). The exact quali- ties of natural settings that might be the most important for solitary restoration are also largely unknown (but see Barnes et al., 2019 for a recent review study on nature visits’ positive mental health benefits and the corre- sponding elements of nature).

The evidence also suggests that company of friends may enable people to experience restoration in nature without concerns for safety. Moreover, company may enhance restoration through the mutual appreciation of the given natural setting but it also may degrade restoration if attention is drawn away from the environment. Very little is known about the number of unknown people in a natural setting that we tolerate without distur- bance to restoration. Furthermore, when people experience restoration in nature they are also likely to develop place attachments. The role of these place attachments in the development of identity, emotion‐ and self‐ regulation would be an appealing and fruitful line of study for future researchers (Korpela, 2012).

# Intentional Solitude and Mindfulness: The Benefits of Being Alone

In the last few decades a movement for the promotion of stillness, meditation, mindfulness, and a type of inten- tional solitude has emerged. This movement began in the mid‐1980s with an exploration of the practice of mindfulness as an alternative to pain management (Kabat‐Zinn et al., 1985). Relief from pain, anxiety, and rumination was found in ancient Eastern practices of calming the mind, giving attention to the body, and devel- oping a stillness that encouraged less judgment, more awareness, and compassion for suffering (Kabat‐ Zinn, 1990). The word *mindfulness* is derived from the Buddhist *sati* or *smrti* describing a mind and body connection or a “natural, uncontrived, spontaneously arisen awareness that is inseparable from every moment of experience” (Van Gordon et al., 2015, p. 51). The potential benefits of mindfulness practice as a type of pur- poseful solitude that provides a space of awareness and attention to the present moment in a nonjudgmental way has begun to be examined empirically (Kabat‐Zinn et al., 1985) for everyone from school children (Butzer et al., 2016), to physicians (Epstein, 2018), to individuals in prisons (Auty et al., 2017). In this chapter we will explore how mindfulness provides a positive type of solitude for children, adolesents, and adults. In an adult context, research has provided evidence for how trait and state mindfulness may benefit the individual, their romantic relationships, and their sexual experience.

##### Seeking Solitude Through Mindfulness and Meditation

Practicing mindfulness requires solitude (physical, mental, emotional, or some combination of the three), but it is a chosen, intentional, positive solitude, not an imposed, unwanted solitude (Kabat‐Zinn, 1994). Although mindful solitude might be defined as meditating alone and in a quiet place, in reality mindfulness is a quality of presence (Kabat‐Zinn, 2015). Consequently, this quality of presence can be practiced in physical solitude, or in a crowded room. This quality of presence encourages a rich experience of mental curiosity and renewal, instead of mental isolation. Additionally, this quality of presence creates an environment of emotional accept- ance and connection, instead of emotional isolation. Mindfulness is not an emptying of the mind, but rather

an openness and sensitivity to the nuances of an individual’s emotions and physical responses (Teper et al., 2013). Mindfulness encourages a change in individuals’ cognitive and behavioral attention to their breath and body. As individuals tune in to their breath and maintain present moment awareness, they can redirect their thoughts to eliminate a ruminating on the past or future, accept self and others without judgment, and develop a focused compassion (Duncan et al., 2009; Frank et al., 2015). Physical, mental, and/or emotional solitude may help effectuate these changes.

Mindfulness practice provides an opportunity for people to turn inward and nonjudgmentally witness their inner experiences. Therefore, positive solitude is much different than isolation or loneliness, rather, it is created, maintained, and employed by the individual to purposefully practice a deeper sense of awareness and acceptance (Teper et al., 2013). Again, positive solitude or mindful solitude is not an emptying of the mind, or mindlessness. Instead, this kind of solitude is a more sensitive attunement or openness to the subtle changes in the individual’s state of mind or surrounding environment in a curious, nonjudgmental way (Teper et al., 2013). Although methodologically a complex construct, mindfulness can be differentiated as a momentary state, trait‐like personal quality, or set of practices that nurture the development of mindful states and may lead to a mindful way of living (e.g., Davidson, 2010). Furthermore, mindfulness has an intrapersonal aspect (the ability to nonjudgmentally notice internal experiences, thoughts, and body sensa- tions) and an interpersonal aspect (an ability to stay present to one’s own experiences in social interactions and cultivate a caring attitude toward the experiences of others; Duncan et al., 2009). Mindfulness‐based manifestations of solitude can be generated via a number of sources (for examples, see Salmon & Matarese, 2014). Engaging in mindful solitude may take many forms – formal and informal meditation, yoga, prayer, retreats, and experiencing nature – and may benefit a wide array of individuals in varying circumstances. The following sections outline several of these potential benefits for children, adolescents, and adults.

##### Positive Solitude/Mindfulness for Children and Adolescents

Unlike previous generations, many children and adolescents in contemporary society have the ability to be *constantly connected* to others through the use of a variety of digital devices and social media platforms. In fact, 72% of children in the United States used a mobile device in 2013, which represented an increase from 38% in 2011 (Rideout et al., 2013). In children younger than two years of age, 38% used a mobile phone in 2013, compared to 10% in 2011 (Rideout et al., 2013). In one lower‐SES community in the United States, most two‐ year‐old children used a mobile device daily, and most children had their own mobile device by age four (Kabali et al., 2015).

Although technology can be beneficial, this omnipresent tech environment carries potential risks, such as negative effects on sleep, attention, learning, and possible exposure to inappropriate content (Chassiakos et al., 2016). With regard to solitude, this constant connection to friends, advertising, videos, and other types of media creates a situation in which children are rarely disconnected. Mindfulness meditation and yoga practice, as forms of positive solitude that allow individuals to look inward, may help mitigate negative issues related to technology use and addiction. For example, Song and Park (2019) found that trait mindfulness partially mediated the relationship between stress and internet addiction; in addition, Shadbad (2017) found that mindfulness‐based group therapy reduced internet addiction for adolescent girls.

As a form of positive solitude, mindfulness and yoga may provide children and adolescents with the abil- ity to momentarily disconnect from (and become more aware of ) the influence of technology on their lives, as well as the potential effects of a variety of stressors that are commonly experienced by youth, such as issues with family dynamics and academic stress (Ryan‐Wenger et al., 2005). Theoretical perspectives on mindfulness suggest that encouraging a momentary pause and inward‐focused attention may help children and adolescents become more aware of their internal thoughts and emotions, thus enhancing their adap- tive coping resources and the ability to regulate their thoughts, emotions, and behaviors (Dvořáková et al., 2019). In other words, in an age where their minds are frequently engaged in practices that might negatively impact them (i.e., technology), by taking time for positive solitude through practices like mindfulness and yoga, children and adolescents could develop important social and emotional skills that are beneficial in a

variety of areas of life (Butzer et al., 2016). Although most mindfulness scholars do not explicitly describe mindfulness as a form of positive solitude, mindfulness is often presented as an opportunity for young people to turn inward in environments that are so often focused on constant connection to media, outward achievement, and future goals (Ergas, 2019a; Ergas, 2019b). For example, young people could even take a momentary pause to create mindful solitude in the midst of a crowded room. This theorectical perspective on mindfulness is supported by a growing body of research that will be discussed in the following sections.

*Research on mindfulness and yoga for children and adolescents.* Several systematic review papers and meta‐analyses of mindfulness and yoga for childen and adolescents suggest that these interventions may have beneficial effects. These systematic reviews and meta‐analyses summarize research on children and adolescents with ages ranging from approximately 4 to 18 years from a variety of socioeconomic backgrounds (including some studies conducted outside of the United States), which indicates that the findings may apply to a wide range of populations. These studies suggest that yoga and mindfulness may have beneficial effects on outcomes such as mental health (Carsley et al., 2018; Felver et al., 2016; Khalsa & Butzer, 2016; Zoogman et al., 2015), well‐being (Carsley et al., 2018; McKeering & Hwang, 2019), prosocial behavior (Felver et al., 2016), social‐emotional skills (Maynard et al., 2017), cognitive performance (Dunning et al., 2019; Maynard et al., 2017; Zenner et al., 2014), depression (Chi et al., 2018; Dunning et al., 2019), resilience (Zenner et al., 2014), and anxiety and stress (Dunning et al., 2019; Zenner et al., 2014).

For example, a group of 19 New York City high school students (mean age = 16 years; 86.5% Black/African American) who participated in a 16‐week yoga intervention reported significantly increased emotion regula- tion compared to students in a physical education control group (*n* = 18) (Daly et al., 2015). These benefits from mindfulness interventions have also been shown in behavioral improvements in impulsivity and aggres- siveness in a group of 27 high school students aged 12 to 19 in Spain (Franco et al., 2016), as well as diminished unexcused absences, detentions, and increased stress‐coping strategies such as emotion regulation and positive thinking in a group of 159 inner‐city high school students (Frank et al., 2017).

Not only do mindfulness and yoga seem to alleviate negative behaviors, but these interventions have also been found to increase prosocial behaviors in children and adolescents. For example, a group of 30 pre- school children from a mid‐sized Midwestern city (mean age = 4.67 years) who were randomly assigned to participate in a mindfulness‐based kindness intervention showed greater improvements in social compe- tence and social‐emotional development over children in a control group (*n* = 38), who exhibited more selfish behavior over time (Flook et al., 2015). Similarly, in a systematic review of 16 studies of mindful- ness‐based interventions (MBIs) for empathy and/or compassion in children and adolescents aged between 5 and 18 years, Cheang, Gillions, and Sparkes (2019) found strong evidence that MBIs may increase empa- thy, and moderate evidence that MBIs may increase self‐compassion (which was correlated with increases in mindfulness).

Research also suggests that the practice of mindfulness and yoga could possibly enhance children’s resilience, thus helping them cope with negative life events. For example, researchers examined the effects of a 10‐week school‐based yoga program in several urban, low‐income communities in Southern California. The 30 children in their sample were aged between 9 and 14 years (50% Latino; 50% African American), and showed significant increases in resilience from before to after the program (Sarkissian et al., 2018). Similarly, an additional study compared the effects of a seven‐session Learning to BREATHE mindfulness intervention to a health education control group (Felver et al., 2018). The study used a sample of 29 high school students from an urban neighbor- hood in New York state (mean age = 16 years; 48% Black/African American) and found that students in the the mindfulness intervention reported stable levels of resilience over time, whereas students in the control group reported significant decreases in resilience. Furthermore, mindfulness practice can be particularly beneficial dur- ing important life transitions, such as the transition to college (Dvořáková et al., 2017) through the benefit of healthy stress response and increased coping resources (Dvořáková et al., 2019).

Taken together, this research suggests that there are positive aspects of mindful solitude that can be benefi- cial not only for adults, but for children and adolescents as well. It is perhaps the case that by taking the time

for intentional solitude through practices like mindfulness and yoga, children and adolescents can tap into internal resources that promote beneficial outcomes in a variety of areas related to thoughts, emotions, and behaviors. Indeed, Butzer et al. (2016) review a variety of research studies suggesting that yoga practices (pos- tures, breathing, relaxation and meditation) could have beneficial effects on three specific internal resources: mind‐body awareness, self‐regulation, and physical fitness. These internal resources may, in turn, have a posi- tive impact on a variety of behaviors, mental states, health, and performance such as improvements in mood, academic performance, and well‐being.

Preliminary research is beginning to support these ideas. For example, research suggests that yoga and mindfulness are associated with enhanced mind‐body awareness (Brisbon & Lowery, 2011; Shelov et al., 2009) and physical fitness in adults (Cramer et al., 2014) as well as improvements in self‐regulation in children and adolescents (Bergen‐Cico et al., 2015; Daly et al., 2015; Razza et al., 2015). In addition, as described above, yoga and mindfulness have been associated with a variety of beneficial outcomes for children and adolescents including improvements in mood (Felver et al., 2015), academic performance (Butzer, van Over et al., 2015), and well‐being (Huppert & Johnson, 2010). Indeed, research on adults suggests that being in solitude may reduce the intensity of mood (although not altering its valence) (Nguyen et al., 2018).

Engaging in positive solitude at an early age might be particularly important, because children’s brains (namely the prefrontal cortex) continue to develop and mature up to the age of 25 ( Johnson et al., 2009). The prefrontal cortex is implicated in several executive functions, including self‐regulation, making childhood and adolescence a particularly critical time period for establishing self‐regulatory capacities and encouraging ben- eficial neurocognitive development (Kaunhoven & Dorjee, 2017; Zelazo & Lyons, 2012). Research on adults suggests that mindfulness is associated with changes in the structure and function of a variety of brain regions, including the prefrontal cortex (Tang et al., 2015), and researchers have hypothesized that mindfulness may have similar effects on the neurocognitive development of children and adolescents (Kaunhoven & Dorjee, 2017; Tang et al., 2012; Zelazo & Lyons, 2012). In summary, the many positive ways of engaging in solitude – mind- fulness, yoga, meditation – have the potential to positively impact brain development, which could lead to continued beneficial effects in adulthood (Kaunhoven & Dorjee, 2017; Sanger & Dorjee, 2015; Zelazo & Lyons, 2012).

It is important to note that most of the research on mindfulness and yoga for children and adolescents is preliminary, and additional rigorous, randomized controlled trials need to be conducted. However, this prelimi- nary research suggests that positive solitude acquired through mindfulness and yoga has beneficial effects, and as such may be an important tool in balancing the loud, stressful, technology‐filled world (and all of the poten- tially negative effects thereof ) in which children and adolescents are developing. As such, future research should continue to explore the effects of purposeful and meaningful disconnection for youth.

##### Gaining Acceptance and Perspective in Positive Mindful Solitude in Adulthood

The beneficial outcomes of mindful solitude described for children and adolescents appear to continue into adulthood. As Hans Margolius reflected, “Only in a quiet mind is adequate perception of the world” (Fedor, 2009, pg. 3). Sitting in silence or finding solitude through yoga, guided meditation, prayer, and/or retreats encourages individuals to develop more self‐awareness regarding their thoughts, emotions, and behaviors. This self‐awareness provides a number of benefits, such as increased emotional regulation and self‐esteem, and reduced stress, depression, and anxiety (Goyal et al., 2014). Additionally, this type of posi- tive solitude encourages better communication in relationships and heightened interpersonal connection (Boorstein, 1996; Karremans et al., 2017). As individuals develop a pattern of quieting their mind, they may cultivate the capacity to transfer these patterns into their interactions with others. They may not only observe their own thoughts with a sense of curiosity and objectivity, but might also interact with others in a less automatic or reactive pattern. Adults may also develop more intentional behavior via mindful soli- tude, which increases feelings of nonjudgment and acceptance (Kabat‐Zinn, 1994), and a sense of belong- ing (to oneself, a relationship, humanity; Boorstein, 1996; Karremans et al., 2017) without needing the approval of others (Shorey et al., 2015). Mindful solitude may become even more challenging when

individuals’ lives become more complex as they juggle jobs, children, romantic relationships, and other pressures. Next we describe the benefits that research has identified between mindfulness and individual well‐being, relational well‐being, and sexual well‐being in adulthood.

*Mindful solitude and individual well‐being.* Research indicates the practice of mindfulness could possibly alleviate a number of troubling psychological and physical effects of stress (Goyal et al., 2014). Individuals who participate in mindfulness‐based therapy have reported diminished anxiety (Hofmann et al., 2010), less frequent relapse of depression (Kuyken et al., 2008), reduced depressive symptoms (Strauss et al., 2014), lowered stress (Chiesa & Serretti, 2009), an alleviation of persistent pain (Grossman et al., 2007), improved quality of life (Kuyken et al., 2008), and lower levels of psychological or emotional distress (Xu et al., 2016).

The positive solitude that can be developed by practicing mindfulness meditation is an internal process of quiet reflection that has been shown to be effective for improving individuals’ physical and mental well‐ being in a variety of populations (e.g., Hofmann et al., 2010; Khoury et al., 2013; Strauss et al., 2014). The goal of mindfulness practice is not to change thoughts by disproving them or generating contrary evi- dence. Instead, mindfulness is thought to be effective in alleviating negative psychological and physical symptoms by encouraging a non‐striving attitude of acceptance and awareness of the symptom (pain, anxi- ety, etc.) and a tolerance for the initial discomfort that allows the individual to rethink automatic responses and choose responses more purposefully. In treating depression and anxiety, mindfulness‐based therapy outperformed non‐evidence‐based treatments and active control conditions and performed comparably to cognitive‐behavioral therapy (Hofmann & Gómez, 2017). In potentially difficult situations, mindfulness skills may provide a way to enhance one’s preparedness to face the difficulties as well as encourage adaptive responses during and after a stressful situation (Dvořáková et al., 2019). Even within populations suffering from severe mental illness, mindfulness interventions outperformed other non‐pharmaceutical treatments such as health education and psychotherapy, and the positive effects were relatively long‐lasting (Khoury et al., 2013).

Mindfulness has also been associated with more favorable evaluations of self. For example, a meta‐analysis found

that a disposition toward mindfulness is consistently associated with higher self‐esteem, although additional research is needed to validate these findings with more rigorous methodology (Randal et al., 2015). Despite meth- odological limitations, evidence indicates that through mechanisms such as increased self‐compassion and emo- tional regulation, mindfulness plays an important role in an individual’s self‐assessment (Keng et al., 2011). Although solitude is often thought of as being negative, intentional positive solitude practiced through mindfulness helps people slow down their thought process and observe their thoughts and emotions objectively, understanding that these are momentary experiences and not permanent conditions. This ability to observe likely results in more accurate evaluations of oneself and provides a respite from regular, often harsh, self‐evaluations (Brown & Ryan, 2003; Brown et al., 2007; Lakey et al., 2008). Consequently, mindful solitude is associated with self‐worth and a healthy evaluation of identity (Heppner & Kernis, 2007).

*Mindful solitude and relational well‐being.* The first steps of mindful solitude likely require some alone time, for example sitting quietly in meditation. However, as individuals gain confidence with their ability to notice internal experiences, thoughts, and body sensations (intrapersonal mindfulness), they may be able to expand this mindful awareness practice when in the presence of others (interpersonal mindfulness; Duncan et al., 2009; Frank et al., 2016). Keeping a sense of embodiment while in a crowded classroom, marketplace, or social event requires the same skills as remaining mindful while alone; however, the added distractions of the presence of people will require the need to create a place of internal solitude.

Interpersonal mindfulness is defined as remaining aware and nonjudgmental in the presence of others and includes practices such as listening with full attention, present‐moment awareness, an acceptance of others, and self‐ and other‐focused compassion (Duncan et al., 2009; Frank et al., 2016). Research has exam- ined how interpersonal mindfulness may be linked to romantic relationship well‐being (Kimmes et al., 2018). For example, relationally mindful individuals felt healthier attachment to their partner, which is a protective

element of a relationship (Kimmes et al., 2018). Additional benefits likely occur as individuals develop an ability to regulate emotions early on in the process of interacting with others (Teper et al., 2013).

Research suggests that relationally mindful individuals engage in open, receptive attention and awareness, and gauge their thoughts, emotions, and physical responses within the interaction. Additionally, relationally mindful individuals extend their focus to the relationship and responses of their partner (Atkinson, 2013; Brown & Ryan, 2003; Duncan et al., 2009; Frank et al., 2016; Kimmes et al., 2018; Kozlowski, 2013; Pruitt & McCollum, 2010). In other words, individuals who practice mindful awareness can be present with others and not lose a sense of their own identity.

Scholars have examined the mechanisms of mindfulness that may encourage these beneficial outcomes. The three mechanisms often decribed are slowing down response time, acceptance, and increased empathy. First, mindfulness skills encourage individuals to observe their thoughts and feelings without immediately reacting, which might slow the individuals’ response to allow for more intentional behavior (Boorstein, 1996; Karremans et al., 2017). Slowing the process can calm the individual, create a sense of curiosity about the experience, and allow them to approach the relationship with a more positive perspective.

Second, Karremans and colleagues (2017) theorized that mindfulness helps individuals recognize that while a partner’s relational shortcomings or relational fluctuations may contribute to conflict within the relationship, so might the individual’s response to these shortcomings or fluctuations. This acknowledgment creates an environ- ment of acceptance and diminished stress (Karremans et al., 2017). Although maintaining mindfulness can be a challenge with a romantic partner, relational mindfulness is linked with greater connection, empathy, and satis- faction within the relationship (Kimmes et al., 2018). Consequently, individuals who take time for personal silence and awareness in their relationships are generally more satisfied with their relationships and experience less relationship stress (Barnes et al., 2007; Carson et al., 2004; Davis & Hayes, 2011; Karremans et al., 2017).

The last mechanism is greater communicated empathy. Mindful people may communicate with more empa- thy, thereby creating more nonverbal and verbal emotional support ( Jones & Hansen, 2015). Mindful people have better social skills in that they are more aware of others’ responses and can describe in greater detail their own perceptions ( Jones & Hansen, 2015). This heightened communication skill allows mindful individuals to cope with conflict and reappraise the relationship in a more positive way (Carson et al., 2004; Jones & Hansen, 2015), which likely leads to better relationships. Increased empathy is also manifest through higher levels of connection to loved ones, humanity, and nature (Aspy & Proeve, 2017). Indeed, a strong practice of individual mindful solitude is likely useful to maintain an inner quiet in the presence of others.

In sum, these findings indicate that mindful solitude even in a loving romantic relationship can be beneficial as mindfulness may improve emotional regulation, acceptance, and empathic communication skills that foster conflict resolution, emotional support, and connection.

*Mindful solitude and sexual well‐being.* Building on the foundation of remaining present and aware while in the presence of others (Kimmes et al., 2018), practicing positive solitude during a sexual experience may be more difficult to achieve than being mindful in other day‐to‐day experiences. Even individuals who are mindful in daily activities in the presence of others (eating, walking or engaging in everyday conversations) might find it difficult to remain mindful during a sexual experience (state mindfulness) because of heightened feelings of self‐judgment and anxiety (Kempeneers et al., 2018). State mindfulness is defined as the level of mindfulness experienced within a particular interaction in daily life (Brown & Ryan, 2003). That is, trait mindfulness is important and necessary but likely not sufficient for maintaining mindfulness during sexual experiences. Although prior work has established associations between trait mindfulness and relational satisfaction (e.g., Atkinson, 2013; Barnes et al., 2007; Carson et al., 2004; Davis & Hayes, 2011; Kimmes et al., 2018; Kozlowski, 2013; Pruitt & McCollum, 2010), researchers recently examined sexual mindfulness (state mindfulness) within a midlife adult sample and found that sexual mindfulness predicted relational and sexual satisfaction above and beyond trait mindfulness (Leavitt et al., 2019). Therefore, the inherent disposition to be mindful (trait mindfulness) may need to be paired with an ability to also maintain that mindfulness in emotionally and physically arousing situations such as sex (state mindfulness).

Research has suggested that one way a space of solitude within a sexual experience, or sexual mindful- ness, may benefit people in their sexual experiences is by diminishing cognitive interference or anxiety, which is a pernicious detractor of satisfying sexual relationships (Barnes et al., 2007; Brown & Ryan, 2003; Newcombe & Weaver, 2016). Cognitive interference occurs when individuals are distracted by concerns over their appearance, sexual performance, or other daily distractions during sexual encounters (Newcombe & Weaver, 2016). Individuals who create a mindful awareness without judgment during sexual experiences may possess an enhanced ability to observe their thoughts and feelings without immediate reaction (Leavitt et al., 2019). For example, women who reported more daily mindfulness experienced less cognitive interfer- ence and better sexual outcomes (Newcombe & Weaver, 2016). Measuring a person’s ability to remain mind- ful despite the anxieties of sex may provide a clearer association between being mindful and sexual outcomes.

Like other practices of mindfulness, sexual mindfulness can be taught (Leavitt et al., 2020). A recent inter- vention taught young and midlife couples several skills that encourage sexual mindfulness by emphasizing that sex need not be goal oriented but instead encouraging a present‐focused, accepting, and nonjudgmental orien- tation toward sex (Leavitt et al., 2020). Additionally, women with higher sexual arousal patterns showed posi- tive associations with sexual mindfulness (Leavitt et al., 2019), and both men and women reported that being aware of their own emotional and physical arousal allowed them to be more present with their partner (Leavitt et al., 2020). In summary, when individuals are aware and accepting via sexual mindfulness, they communicate positive emotion, feel connected, and are more accepting of their partner.

##### Developing Positive Mindful Solitude

With so much research indicating that spending time alone with purposeful attention can provide a number of positive outcomes, many ask the question, “How can I develop the art of mindful solitude?” Most mind- fulness scholars and practitioners would simply answer, practice. Mindful living is quite simple, but it takes practice. It is simple enough that children can learn to take a breath, physically relax, and focus attention on their body. However, this simple practice requires regular devotion that will need to continue throughout a lifetime. Mindful living entails a new attitude to life experiences. Slowing down thoughts takes effort. As strange as it sounds, giving our mind a rest is hard to do. For example, the majority of undergraduate stu- dents would rather self‐administer an electric shock than sit “alone with their thoughts” for 15 minutes (Wilson et al., 2014). However, experiencing quiet solitude for as little as ten minutes per day seems to help individuals begin seeing the benefits of mindfulness (Berghoff et al., 2017). Numerous mindfulness pro- grams exist for children (Butzer, Ebert et al., 2015; Meiklejohn et al., 2012) and adults (Ackerman, 2017), and there are popular mobile mindfulness applications such as HeadSpace (2019) and Insight Timer (2019) as well. Readers are encouraged to explore these programs to identify which approach might be best suited to their unique needs.

##### Conclusion

As individuals engage in positive solitude they slow down, disrupt habitual and reactive patterns of thought, and take time to notice things from a new perspective (Langer & Moldoveanu, 2000). From this simple practice many have found that they are more curious, more aware, and more joyful at the moment and over time (Langer & Moldoveanu, 2000). These benefits of positive mindful solitude may then branch out to affect the individual’s interpersonal and sexual relationships (Kimmes et al., 2018; Leavitt et al., 2020), thus having a posi- tive impact on both their personal and relational well‐being. The Italian writer Luciano Crescenzo (n.d.) stated it this way, “We are each of us angels with only one wing, and we can only fly by embracing one another.” Indeed, our effort to better connect with ourselves, our partners, humanity, and nature through positive mind- ful solitude is an important antidote to isolation and loneliness.

# Loneliness and Associated Mental Health Sequelae in Individuals with Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by pervasive challenges in social communication, as well as repetitive interests or behaviors. Social challenges are considered a core deficit of ASD, as many individuals on the spectrum struggle with social interactions and associated milieu. ASD rep- resents a broad spectrum of cognitive, linguistic, and social abilities, and therefore there is substantial variation in the social experiences of individuals on the spectrum. Contrary to traditional perspectives, individuals with autism do not always prefer to be alone. Many individuals with autism seek out social partners but face chal- lenges in engaging in these interactions due to difficulties with social competencies (Bauminger et al., 2003; Jaswal & Akhtar, 2019). As a result, feelings of loneliness may arise. Others on the spectrum do prefer to be alone and, thus, they may appear to be less motivated to establish relationships with others. This scenario results in aloneness without the experience of loneliness (e.g., Coplan et al., 2015). A preference for solitude and loneliness are not mutually exclusive in ASD, and there is great variability across individuals (Deckers et al., 2017). The distinction between loneliness and aloneness is important to consider when examining loneliness in ASD.

Loneliness is widely conceptualized as an aversive, negative affective state, often likened to depression or anxiety (Russell et al., 1984). Individuals with autism report higher levels of loneliness in comparison to neuro- typical peers in childhood, adolescence, and adulthood (Bauminger et al., 2003; Mazurek, 2014). In typical development, loneliness is linked to a greater risk for a host of negative psychological outcomes, including depression and anxiety (Cacioppo & Cacioppo, 2012; Qualter et al., 2010; Cacioppo et al., 2006). In order to identify evident risk and protective factors as well as treatments for these negative outcomes, it is critical that we comprehensively understand the experience of loneliness in ASD.

The following sections will examine the literature on loneliness and social experiences of children on the autism spectrum. First, we examine extant theories of loneliness. Next, we describe how children with ASD conceptualize loneliness and provide perspective on the pervasiveness of loneliness in ASD compared to neu- rotypical peers, underscoring the importance of understanding this phenomenon further. We then review the literature on friendship quantity, reciprocity, and quality among children with ASD. Lastly, we review potential negative sequelae of loneliness for those on the spectrum in childhood and across the life course, as well as protective factors and intervention approaches.

##### Theoretical Basis of Loneliness

Several distinct theories have aimed to elucidate the experience of loneliness and uncover underlying mecha- nisms that contribute to the affective state. The Cognitive Discrepancy Model posits that loneliness arises from one’s awareness of a discrepancy between their desired and actual friendships (Perlman & Peplau, 1982). Later‐ developed theoretical frameworks such as Social Self‐Discrepancy Theory build on this model by acknowledg- ing how awareness of this discrepancy may vary across development and between individuals (Kupersmidt et al., 1996).

Early conceptualizations of loneliness delineate two distinct types, including emotional and social cognitive loneliness (Perlman & Peplau, 1982). A distinction is also made between peer and family‐related loneliness (Marcoen & Goossens, 1993). The current chapter will focus on emotional and social cognitive loneliness in relation to ASD, although a full review of loneliness among other populations across the life span are provided in Chapters 4, 11, and 15 of this volume.

Emotional loneliness, as conceptualized within the aforementioned Cognitive Discrepancy Model, includes the feelings of loneliness often felt in relation to the loss of an intimate companion or attachment figure. Social cognitive loneliness refers to a person’s perception of their lack of social companionship or socially fulfilling relationships. This type of loneliness may be experienced via social comparison to peers or awareness of one’s friendships being less intimate, for example. Neurotypical children report experiencing both social cognitive and emotional types of loneliness (Asher & Wheeler, 1985; Renshaw & Brown, 1993).

##### Loneliness in ASD

The aforementioned theoretical frameworks operate on the assumption that the individual experiencing loneli- ness has the ability to perceive the self in relation to others. Individuals on the autism spectrum characteristi- cally have challenges in the social domain, namely in understanding nuances of social interactions and relationships (Lee & Hobson, 1998). Importantly, because autism is a spectrum disorder, there is great hetero- geneity in the abilities of those on the spectrum. Therefore, when examining loneliness in ASD it is critical that we consider both the potential impacts of the social deficits characteristic of ASD as well as the significant vari- ability in social experiences across development and between individuals.

##### Understanding Loneliness in ASD

In considering loneliness in ASD, we must first examine how children with autism understand the concept of loneliness itself. Over the course of the past several decades, Bauminger and colleagues have amassed a body of work that examines the conceptualization of loneliness in children on the spectrum (see Bauminger & Kasari, 2000; Bauminger et al., 2003, 2004; Bauminger‐Zviely & Agam‐Ben‐Artzi, 2014). One of these seminal studies examined how verbal children with ASD understood loneliness (Bauminger & Kasari, 2000). Researchers asked the 8‐ to 14 year‐old participants to “describe what lonely means” from their perspective and to give an example of a time when they felt lonely. Youth with autism were similar to their neurotypical peers in identify- ing social‐cognitive aspects of loneliness in their descriptions (e.g., social exclusion, feeling unsatisfied with their social relationships). However, only 30% of children with ASD included emotional components (e.g., sadness, frustration) with their description of loneliness, compared to 74% of youth without ASD. These results suggest that children with ASD may have an incomplete understanding of loneliness.

Bauminger and colleagues’ 2003 study further probed the emotional understanding of loneliness among a group of slightly older verbal children and adolescents (aged 8 to 17 years old) on the spectrum (Bauminger et al., 2003). Open‐ended, direct questions about emotional aspects of loneliness were posed to participants (e.g., “Can a child feel lonely when he/she is with his/her close friend?”). Results showed that youth with ASD and neurotypical peers had equally complex understandings of the emotional aspects of loneliness. Taken together, these findings suggest that there may be developmental changes in the understanding of loneliness in ASD, where children demonstrate a less complete understanding of the concept than their

neurotypical peers until adolescence (Bauminger & Kasari, 2000; Bauminger et al., 2003). A more compre- hensive understanding of loneliness may occur later in development for those with ASD compared to neu- rotypical peers due to social challenges associated with the diagnosis (e.g., difficulties with social comparison, self‐perception of one’s role in social contexts). It should be noted that these developmental findings pertain to individuals with ASD without comorbid cognitive deficit or significant language impairment. We know almost nothing about individuals’ concepts of loneliness who are also intellectually delayed or impaired.

##### The Experience of Loneliness in ASD

In addition to demonstrating a more comprehensive understanding of loneliness during adolescence, indi- viduals with ASD also report experiencing loneliness more often than neurotypical peers. Bauminger et al.’s 2003 study investigated experiences of loneliness in addition to emotional understanding among youth with ASD (Bauminger et al., 2003). Study investigators probed self‐reported experiences using a modified ver- sion of the Loneliness Rating Scale (Asher et al., 1984; see Bauminger et al., 2003 for adapted measure descrip- tion). Youth with ASD reported experiencing greater emotional and social cognitive loneliness in comparison to matched neurotypical peers. Bauminger and colleagues note that although the adapted self‐report loneli- ness measure had high internal consistency, the small sample size warranted further investigation into the loneliness experiences of youth on the spectrum. As a result, several more recent cross‐sectional studies exam- ined experiences of loneliness among verbal adolescents and adults with ASD utilizing a myriad of self‐report loneliness measures (e.g., UCLA Loneliness Scale, Louvain Scale of Loneliness). Results echo the Bauminger et al., 2003 finding, with adolescents on the spectrum reporting more loneliness than same‐aged neurotypical peers (Feldhaus et al., 2015; Mazurek, 2014) and peers with other developmental diagnoses like ADHD (Deckers et al., 2017).

Individuals with ASD may experience and report greater loneliness during adolescence because of an increased understanding of social relationships and decreased satisfaction with their current friendships ( Jackson et al., 2018). Adolescence gives rise to a host of new social contexts, norms, and expectations while individuals are in the process of developing their own identity and agency. Rapidly changing social environ- ments and milieu during this life stage lead to a greater risk for social isolation and subsequent loneliness (Lasgaard et al., 2010; Locke et al., 2010). The adolescent life stage is likely to present unique challenges and changes for all individuals, particularly for those on the spectrum who are tasked by the nuances of social inter- action and relationships. Among neurotypical individuals, the adolescent experience of loneliness is also differ- ent from that of children or adults (Laursen & Hartl, 2013). In addition to chronological age and life stage, other factors (e.g., developmental age and pervasiveness of social challenges) may play a role in how individuals with autism understand and come to experience loneliness. As a result, research that incorporates the perspec- tives of children and adolescents with ASD around these social experiences is critically needed. These perspec- tives will allow for a greater understanding of how individuals on the spectrum understand and experience loneliness at different points in the life course.

##### Multiple Reporters on Friendships in ASD: What Do We Know and How Do We Know It?

In an effort to understand loneliness in ASD further, many have examined friendships of those on the spectrum. Having friends is crucial to a child’s development of social, communication, and theory of mind skills and is inte- gral to overall well‐being (Bauminger‐Zviely & Kimhi, 2017). Research suggests than many individuals on the spectrum struggle with friendship formation, but family, individual, and contextual factors all play a role in whether a child with autism makes and maintains friendships (Bauminger‐Zviely & Kimhi, 2017; Chang et al., 2016). A lack of socially supportive relationships is linked to a plethora of negative outcomes in adolescence and adulthood for those with ASD, including a greater risk for depression and anxiety (Hedley, Uljarević, Wilmot et al., 2018; Mazurek, 2014). Recent research demonstrates that a greater quantity of high‐quality friend- ships buffers the negative impacts of loneliness among those with autism (Mazurek, 2014). As a result, it is criti- cally important that we cultivate a greater understanding of friendships and nuanced social interactions in autism.

Many studies have begun to investigate friendships in ASD, including reports from teachers, peers, parents/ caregivers, and the youth themselves. Some individuals on the spectrum are unable to self‐report about their experiences due to challenges with language expression and/or comprehension. Thus, parents and teachers are often asked to participate in research studies to report on the child or adolescent’s social behavior and function- ing. In some cases, these surrogate reports may not accurately reflect child behavior or emotional experience, and may contain evident bias on the part of the rater. Although they do not come without their own set of challenges, self‐reported accounts of social experiences are integral to the development of an accurate picture. For this reason we must emphasize the perspectives of those individuals with autism who are able to report about their own experiences with friendship and loneliness. In an effort to present a comprehensive review of loneliness in autism, we next examine the state of current research on friendship among those with ASD, pay- ing particular attention to the reporters included in each presented study.

*Identification of friends.* The majority of children and adolescents with ASD report having at least one friend (Kuo et al., 2013). However, only 20% of elementary‐aged children with ASD in mainstream classes report having reciprocal friends, compared to 60% of neurotypical peers (Kasari et al., 2011). Several studies have further probed the identification of friends among school‐age children with autism. When asked to identify their top three friends, including a best friend, the majority of children with ASD were able to do so (Bauminger & Kasari, 2000; Chamberlain et al., 2007). Parents of the same children with ASD were asked to report on the number of friends their child had (Bauminger & Kasari, 2000). Here, however, parents consistently reported more friends than their children did, evidencing a discrepancy between parent and self‐report on this topic. When probed further, parents described that the friends they reported on included both actual and desired friendships. Therefore, in this case, the child with ASD may have been more accurate than their parent in distinguishing between acquaintances and friends while rating the number of friends had.

Other studies of elementary‐aged youth with ASD find conflicting evidence on the child’s ability to accu- rately identify friends in the school setting. In a sample of second‐ and third‐grade children, children with ASD nominated more peers as friends than neurotypical children in the sample (Chamberlain et al., 2007). However, a peer nomination study of first‐through fifth‐grade children found that participants with ASD identified fewer classmates as friends than their neurotypical peers (Kasari et al., 2011). In both studies, children with ASD received fewer reciprocal nominations than their neurotypical classmates. While 60% of neurotypical peers received reciprocal nominations of friendship, only 18–34% of children with ASD did (Chamberlain et al., 2007; Kasari et al., 2011). Taken together, these findings suggest that children with ASD may have difficulty determin- ing whether certain interactions and relationships are truly reciprocal in nature, reflecting social challenges characteristic of autism.

While most extant studies examine the perceptions of school‐aged children with ASD in relation to number of friends, a recent study extends these investigations to a younger age, looking specifically at preschoolers with autism (Chang et al., 2016). In typical development, children show preference for certain playmates or friends as early as two years of age. To investigate whether these early friendships were present among pre- schoolers with ASD, Chang and colleagues conducted observations of the interactions of 2–5‐year‐old children with ASD with peers and adults during free play in mainstream settings. Friendship was defined by three crite- ria: (1) at least 50% of the child’s social initiation attempts were responded to; (2) at least one unit of joint engagement took place during the interaction; and (3) at least one positive affective exchange was noted (crite- ria adapted from Howes, 1983). Results indicated that 20% of preschoolers with ASD had friends at school, which is consistent with the number of friends reported in studies of elementary‐aged children with ASD. Interestingly, 42% of parents in this sample reported that their child had a friend at school, and 54% of teachers endorsed that the child with ASD had a friend in their class. Given that only one‐third of the sample of pre- schoolers with ASD had friends at school according to observational data, parents and teachers may have over- estimated their identification of friends. Alternatively, it is possible that the observations did not accurately assess friendships these young children with ASD had, as peer interactions may look different than those of

neurotypical children. For example, it may be that the friendships are more fleeting in engagement, or less consistent during times when one would expect to see friends together (such as during playtimes at school). Cultivating a more complete understanding of friendships among preschoolers with ASD may require the use of more frequent observations across a variety of contexts as well as the development of additional measure- ment strategies. New tools and observational strategies have the potential to provide us with a more compre- hensive understanding of the role that friendships (or lack thereof ) may play in the experience of loneliness in young children with ASD.

*Friendship quality.* The presence of even a single friend in a child’s life can protect them from experiencing loneliness (Ladd et al., 1996). Despite the fact that many children with ASD can identify several friends when asked, they report substantially more loneliness than neurotypical children of the same age (Bauminger & Kasari, 2000). It is possible that this may be due to differences in quality and/or reciprocity of identified friendships. Young and older children with ASD consistently report lower‐quality friendships than age‐ and gender‐matched peers (Kasari et al., 2011; Whitehouse et al., 2009). Bauminger and Kasari’s study of friendship and loneliness in ASD found that children with autism rated their friendships as lower in quality than their neurotypical peers, namely in terms of companionship, security, and helpfulness (Bauminger & Kasari, 2000). A mixed‐methods study echoes these findings, as 9–11‐year‐old youth with ASD rated their friendships to be of poorer quality than neurotypical peers in their class (Calder et al., 2013). However, the authors note substantial variability in the self‐reported friendship qualities of individuals with ASD in the study sample. Friendship quality is important to examine among youth with ASD as higher‐quality friendships have been linked to less reported loneliness and greater self‐worth among both children and adolescents with autism (Bauminger et al., 2004; Whitehouse et al., 2009).

Locke et al. (2010) examined friendship quality among adolescents on the spectrum. Compared to neuro- typical peers, adolescents with ASD rated their best friendships as lower quality in terms of companionship and helpfulness. However, adolescents with ASD and neurotypical peers rated the quality of their friendships simi- larly in terms of closeness, security, and conflict (Locke et al., 2010). These findings are supported by additional studies of adolescents with ASD in which participants reported significantly poorer‐quality friendships than neurotypical peers (Whitehouse et al., 2009). Similar to children with ASD, adolescents with autism who report lower‐quality friendships are more likely to report high levels of loneliness.

##### Summary

Friendship is a natural context for practicing a host of cognitive and linguistic skills and is linked to overall child well‐being (Bauminger‐Zviely & Kimhi, 2017). Despite the fact that children with ASD often have fewer friends and lower‐quality friendships than neurotypical peers, nearly all children with ASD can identify at least one friend and most are included in their social networks at school. Importantly, there exists substantial variability in skills and heterogeneity among individuals with autism. It is notable that the current body of work that examines friendship and its correlates in ASD largely employs samples of cognitively‐able, verbal children and adolescents on the spectrum (Bauminger‐Zviely & Kimhi, 2017; Petrina et al., 2014). Future work in this area should seek to include more diverse samples of youth with autism. To this end, observational measures of friendship reciprocity and quality may prove useful. Additionally, examining perceptions of friendship and loneliness in ASD over time using longitudinal designs is needed as the vast majority of extant studies in this area are cross‐sectional in nature.

Dissatisfaction with the quality of friendships or stress derived from navigating complex social milieu may contribute to the high levels of loneliness reported by children with ASD. Endorsement of loneliness generally increases as children with ASD enter adolescence, which is likely a product of increased self‐perception, social comparison, and changing social contexts. Negative self‐perceptions and social rejection are risk factors for the development of loneliness in ASD, consistent with the cognitive discrepancy model.

##### Potential Negative Sequelae of Loneliness

In typical development, research studies have shown that loneliness is linked to a host of negative outcomes, including decreased self‐esteem (Davis et al., 1992), depressive symptoms (Wei et al., 2005), and anxiety (Cacioppo et al., 2006). Among children with ASD, greater loneliness is related to decreased feelings of self‐ worth and increased levels of social anxiety (Bauminger et al., 2004; White & Roberson‐Nay, 2009). Additionally, there is evidence to suggest that depression in adolescence may be an outcome of loneliness in childhood. For example, persistent loneliness in the context of peer relationships during the early childhood period (ages 5–8 years) was found to predict depressive symptoms at age 13 (Qualter et al., 2010).

In recent years there has been an increase in the number of cross‐sectional studies examining correlates of loneliness in ASD during adolescence and adulthood. A 2017 study by Hedley and colleagues investigated potential mechanisms underlying depression and thoughts about self‐harm among individuals with ASD aged 17 to 56 years old (Hedley et al., 2017). Loneliness was found to confer a greater risk for depression, which in turn raises the risk for endorsing thoughts of self‐harm. Another study of adults with ASD found that better friendship quality and a higher quantity of self‐reported friends were related to lower ratings of loneliness (Mazurek, 2014). Both studies reported that loneliness was related to greater depression and anxiety and lower life satisfaction, and these findings have been replicated in adolescents with autism (Feldhaus et al., 2015).

Results of these studies suggest that interventions that directly address loneliness (perhaps by targeting friendships) may be helpful in preventing other negative psychological sequelae among individuals with ASD. Despite this fact, many available interventions do not directly measure loneliness as a treatment outcome. Instead, many examine social isolation among individuals with ASD (see the following section on interventions for a full description of available treatment approaches). Social rejection by peers and self‐isolation can lead to loneliness and other negative mental health outcomes in ASD, which in turn may facilitate greater social isola- tion (Laursen & Hartl, 2013). Although related, social isolation and loneliness are distinct, and, therefore, it may be important for intervention studies to target both when treating individuals with ASD.

##### Protective Factors Against Loneliness Among Individuals with ASD

A growing body of research has identified several protective factors with the potential to buffer individuals with ASD from experiencing loneliness and/or its negative impacts. Social support, the development and main- tenance of reciprocal friendships, and a sense of belonging to one’s school or other community appear to be particularly important in protecting against loneliness and associated psychological sequelae.

*Social support.* Research has begun to elucidate protective factors that may buffer the negative impacts of loneliness on individuals with ASD. Some promising findings have emerged with regard to social support. For example, in a study of 39 adolescent boys with ASD, perceived social support was negatively correlated with loneliness, illustrating that it may be a protective factor and relevant intervention target (Lasgaard et al., 2010). Another recent study of 14–80‐year‐old individuals with autism found that the effect of the number of perceived social supports on depression was mediated by loneliness and satisfaction with that support (Hedley, Uljarević, Foley et al., 2018). Therefore, both the amount of perceived social support and one’s satisfaction with that support may be important in ameliorating loneliness and negative sequelae in this population.

*Reciprocal friendships.* The development and maintenance of reciprocal friendships with peers may also be an important step in attempting to prevent loneliness and related outcomes in children with ASD. Friendships develop out of repeated social interactions in which children can connect over shared interests, show mutual care for one another, and learn how to negotiate. Friendships at school may be additionally important since friends can be protective against bullying (Bollmer et al., 2005). Victims of bullying are at increased risk for feelings of loneliness and other negative mental health outcomes as demonstrated by an international study of more than 48,000 children worldwide (Eslea et al., 2004). These findings are echoed in research that looks specifically at bullying in ASD (Bauminger et al., 2003; Humphrey & Hebron, 2015). Children with ASD are

more likely than neurotypical peers and peers with other disabilities to experience bullying (Hong et al., 2015; Humphrey & Hebron, 2015). We need to better understand how to support individuals with ASD in the school setting in relation to bullying, in an effort to ameliorate risk for loneliness and other negative mental health outcomes.

One proposed method for cultivating a greater number of reciprocal friendships is through inclusive class- rooms in schools. Some studies suggest that school inclusion with neurotypical peers is associated with more mutual friendships (e.g., Bauminger et al., 2008); however, other studies provide little evidence for increased reci- procity as a result of inclusion (e.g., Orsmond et al., 2004). Inclusion as a preventative practice may benefit from embedding some targeted social supports or scaffolding for children with ASD. Many young children with autism may have reduced exposure to peers, and, therefore, have fewer opportunities to learn from peer interactions. Even in the presence of peers, some children with ASD may prefer to play independently rather than engage with others as play partners (Calder et al., 2013). Placing a child in a situation that will provide frequent peer interactions (i.e., inclusive classrooms) may not be effective in fostering reciprocal friendships unless there are active attempts to engage the child with ASD and to support them appropriately.

*Belonging and social connectedness.* Related to friendships, a more general sense of belongingness and social connectedness may also be a protective factor for youth with ASD. Feeling a sense of belonging to one’s school depends largely on the cultivation of interpersonal relationships and socially meaningful experiences with peers in the school community (Hamm & Faircloth, 2005). Sense of belonging and connectedness are important in that children and adolescents with high levels of belonging are less likely to have poor social, psychological, and academic outcomes (e.g., school dropout, mental health challenges) (Hagerty et al., 1996; Ma, 2003). Peer relations and exchanges are prime opportunities for cultivating a child’s sense of belonging at school. In an effort to expand opportunities for engagement and friendship‐building with a variety of peers, many have advocated for classroom inclusion with supports for students on the spectrum (see Hehir et al., 2016 for review). Inclusion refers to the idea that all students should be included in general education or “mainstream” classrooms, including those with autism and/or other developmental disabilities. Noninclusive settings refer to the separation of children with ASD in specialized classrooms that are designed to provide them with specific supports as needed. Many youth with autism in general education settings are challenged not by academic demands but rather social expectations (Cai & Richdale, 2016; Mayes & Calhoun, 2008). Studies show that children with ASD in general education classrooms interact mainly with neurotypical peers in inclusion settings, and demonstrate social motivation to develop friendships in this context (Bauminger et al., 2003). Additionally, children with ASD who have friendships with neurotypical peers demonstrate greater positive social orientation, more com- plex coordinated play, and greater overall social responsiveness (Bauminger et al., 2008). In addition to benefits to the child with ASD, inclusion practices may enrich the educational climate for all students in the classroom.

Exposure to and interaction with peers with special needs can increase all students’ acceptance of diversity (Clark & Smith, 1999; Locke et al., 2010).

This exposure to students with autism may be critical to forming positive peer perceptions. When children are given both descriptive and explanatory information about a child with autism’s behavior (e.g., gaze aver- sion, hand flapping), their intentions toward the child are improved (Campbell et al., 2004). Additionally, studies of inclusive elementary classrooms show that only a small percentage of children with ASD are socially excluded from peer social networks (Chamberlain et al., 2007; Kasari et al., 2011). Whereas social rejection is related to greater reports of loneliness and school dropout for youth with ASD, peer acceptance is linked to increased social connectedness and improvements in overall well‐being (Adams et al., 2016).

##### Potential for Interventions

In this final section, we consider the application of these protective factors to the realms of prevention and intervention. To date, three basic types of interventions have been explored that may help limit the effects of loneliness on children with ASD. These interventions include adults as paraprofessional support at school, peer‐mediated interventions, and social skills groups. Each approach is detailed in the sections that follow.

*Adult paraprofessional as support.* A common method of support for children with ASD in the school setting involves the accompaniment of a paraprofessional assistant (a shadow teacher). The paraprofessional provides the child with support when needed, but otherwise may often be directed to fade into the background or to engage with other children, so as to not mark or stigmatize the child with ASD. Some individuals with ASD report that adult paraprofessional support may serve to indeed stigmatize them in the school setting, preventing them from “blending in” (Humphrey & Lewis, 2008). In some cases, the constant presence of a paraprofessional aide may limit or reduce a child’s exposure to peers as they are predominantly interacting with the adult. Despite these concerns, adult paraprofessionals continue to be commonplace in the elementary school setting in particular. In a study of school‐aged children with ASD, 60% of the sample had adult aide support during recess (Kasari et al., 2011). Results showed that children with paraprofessional support were the least engaged on the playground, raising questions about the effectiveness of this support strategy for children with ASD. With this said, a 2014 study tasked paraprofessionals with rating their assigned child with ASD’s social skills on the playground using a novel reporting measure (Locke et al., 2014). Results showed that paraprofessionals ratings were convergent with an independent observer’s observations of the child. In this case, paraprofessionals seemed to be accurately assessing children’s social skills in the playground setting. Paraprofessionals may be accurately assessing social skills on the playground, but may lack training or knowledge to appropriately intervene or scaffold the student with ASD.

Effectiveness of the paraprofessional may depend on the adult’s level of training and knowledgebase in facilitating peer interactions in the school setting. A recent multisite randomized controlled trial trained school personnel (including paraprofessional aides) on playground peer engagement and social skills strate- gies (Shih et al., 2019). When school staff received the targeted trainings, children with ASD on the play- ground were more included in peer social networks (according to peer ratings) and spent less time alone during recess. Results suggest that paraprofessional aides may be effective in supporting increased social interaction for school‐aged children with ASD if they receive developmentally informed, specific training on the topic.

*Social skills training.* Social skills training interventions typically involve direct training by an adult, who delivers social skills information to individuals with ASD in a group or individual setting (Kasari et al., 2012). In group settings, children may then practice the learned skills with peers. A recent meta‐analysis of 19 randomized controlled trials testing group social skills interventions reports moderate overall improvements in social competence for youth with ASD (Gates et al., 2017). The largest effect sizes were found for self‐reported social knowledge gains but not perceived changes in self‐reported social behavior. Therefore, the authors caution that skills learned in the context of these groups may not generalize to school or to self‐reported social behavior. Additional research is needed to investigate whether these skills are being utilized beyond the intervention context. Incorporating more objective measures of change in response to intervention may also prove to strengthen the evidence base in this area.

A recent study investigated this question of generalization. We tested what kinds of social skills groups are most effective in teaching skills that are generalized to the school playground for 6–11‐year‐old children with ASD (Kasari et al., 2016). Results show that social skills taught in didactic groups composed of all children with ASD are more likely to generalize to the school playground than skills taught in activity‐based groups of chil- dren with ASD and neurotypical peers. Overall, these results suggest that didactic social skills groups can be effective in teaching generalizable skills to school‐aged children with ASD.

Importantly, some individuals with ASD may not desire intervention for social challenges (Kapp et al., 2013). This underscores the difference between aloneness and loneliness, as individuals with autism may choose to self‐isolate but may or may not feel lonely as a result. A desire for aloneness and loneliness are not mutually exclusive in ASD (Deckers et al., 2017), and there is substantial variability in the preferences and experiences of those on the spectrum. Preference for solitude as well as willingness to receive support around social interac- tions should be considered when determining the goodness‐of‐fit of a social skills intervention approach for those on the spectrum.

*Peer‐Mediated Interventions.* Peer‐mediated models include peers of the child with ASD as the agents of change. Peers may have the most opportunities to implement intervention strategies and effect change as they often have daily interactions with the child with ASD at school. Additionally, peer‐mediated social support may protect against peer victimization for children with ASD who are frequent targets of bullying (Chang & Locke, 2016). Two recent systematic reviews examining studies of peer‐mediated interventions (PMIs) for children, adolescents, and young adults with ASD report that PMIs are promising treatments for increasing social interaction in individuals with ASD with generalization and maintenance of effects (Chang & Locke, 2016; Watkins et al., 2015). Future work in this area should examine who may benefit most from peer‐mediated interventions.

Prior to engaging in any type of intervention, it is important to note that the heterogeneity of ASD suggests that a single intervention will not be effective for all children; thus it is important to understand the unique strengths and challenges of each child. Providers can offer guidance for families as they seek out an interven- tion approach that is a good fit for their child.

The three types of interventions reviewed in this section have been predominantly tested in children with autism. Despite the fact that loneliness and related sequelae become pronounced during adolescence, substan- tially fewer treatments have been developed and tested for use with adolescents and young adults with ASD (Gantman et al., 2012).

##### Looking Forward: A Focus on Interventions for Adults with ASD

A few recent treatment approaches have been developed in an attempt to address the dearth of available sup- port for adolescents and adults with ASD. Gantman et al. (2012) tested the effectiveness of a caregiver‐assisted social skills intervention (PEERS© for Young Adults) for verbal, average‐IQ 18–23‐year‐old youth with ASD. Caregivers and young adults attended separate 90‐minute long group didactic lessons about social skills rele- vant to young adults (e.g., handling teasing; using appropriate humor) for 14 weeks. Groups were held in a community setting and both live coaching and opportunities for role play were provided. At the end of the 14 weeks, youth who received the treatment reported significantly less loneliness and improvements in their knowledge of social skills (Gantman et al., 2012).

The development and refinement of social skills among young adults with ASD may additionally be critical to their success in postsecondary education environments. Recent research on college students with autism reports that while many individuals with ASD feel comfortable with the academic challenges of school, they feel less equipped to meet social demands ( Jackson et al., 2018). A lower sense of belonging and less social integration with one’s college campus results in a greater likelihood of dropout (Kuh et al., 2008). As a result, social skills training for individuals with ASD should be integrated into the supports offered by college cam- puses (Elias & White, 2018). Recent interventions designed to help facilitate the transition from high school to college for those on the spectrum additionally note the importance of both social skills and self‐regulation in facilitating a smooth integration to postsecondary contexts (White et al., 2019).

These recent approaches were developed to address the gap in available treatments for young adults with ASD; however, more strategies and supportive programs are urgently needed. High rates of self‐endorsed lone- liness and mental health diagnoses are common among youth with ASD, and effective treatments may be most critical during this developmental stage.

##### Conclusion

Loneliness is widely endorsed by children and adolescents with autism, and is distinct from tendencies to self‐ isolate or seek aloneness. Although less research is available on the loneliness experiences of emerging adults and adults with ASD, extent work finds evidence for high endorsement of loneliness in comparison to neuro- typical peers and those with other diagnoses. Cross‐sectional studies show that loneliness in ASD is associated with several negative mental health states, including depression. Social support appears to be a protective factor that buffers against loneliness and associated sequelae in ASD, and the fostering of reciprocal friendships via

classroom inclusion and other practices may also protect against loneliness. Future studies need to examine the developmental trajectory of loneliness in autism utilizing longitudinal designs. Peer‐mediated interventions appear to be promising approaches for supporting social skills among youth with ASD, although more research is needed to determine whom may benefit most from this type of treatment. It is important to note that the majority of participants included in extant research on loneliness, friendship, and social skills interventions are verbal, cognitively able individuals on the spectrum. Thus, future research should seek to understand these concepts in samples that are more representative of the broader autism population. Additionally, more research is needed to determine treatments and supports that are most effective in preventing and treating loneliness and associated psychological diagnoses among adults with ASD.

Finally, we must continue to look to qualitative, descriptive work that centers the reflections and firsthand accounts of individuals with autism. In contrast to traditional perspectives on ASD, many individuals with ASD develop meaningful and stable friendships and do not describe themselves as lonely. Future work should con- tinue efforts to understand these experiences with the aim of identifying effective supports for all individuals with autism.

### Social Anxiety Disorder and Emotional Solitude

People with social anxiety disorder (SAD) desire social inclusion and emotional connections with others but are often unable to establish satisfying relationships. In this chapter we explore the concept of *emotional solitude*. We begin by presenting a thumbnail sketch of SAD as a clinical disorder and then go on to explore how social anxiety establishes a self‐perpetuating cycle that impedes the development of close relationships.

##### Social Anxiety and Social Anxiety Disorder

Social anxiety is a ubiquitous human experience. Most people feel anxiety in some social situations, particularly those in which they anticipate evaluation by others such as job interviews, public speeches, talking with author- ity figures, and dating (e.g., Frances et al., 1995, p. 246). However, some individuals develop *social anxiety disor- der* (SAD; social phobia), a clinical condition marked by a prolonged and intense fear of embarrassment, humiliation, and negative evaluation by others (APA, 2013). Although some people with SAD are anxious in only a few circumscribed situations, most experience anxiety across a broad range of situations in which they have to interact with others. SAD has a lifetime prevalence rate of 7–12% in North America, making it the third most prevalent psychiatric disorder (e.g., Kessler et al., 2005; APA, 2013). It is now believed that rates of SAD in children and adolescents are also high and that SAD is the second most prevalent psychiatric disorder after simple phobia in children and youth (e.g., Costello et al., 2003). The mean age of SAD onset is between 13 and 14, but many individuals report longer histories of anxiety that over time crystallize into the clinical condition.

SAD tends to be a chronic disorder in that fully 60% of diagnosed individuals display clinical symptoms that last for years, and in the most severe cases, can persist for 10–25 years (e.g., DeWit et al. 1999; Yonkers et al., 2001). SAD is associated with a variety of negative effects, including underemployment, financial hardship, and increased use of health care services, and therefore presents a substantial economic burden to society (e.g., Aderka et al., 2012; Katzelnick et al., 2001). The disorder also increases vulnerability to a variety of other disor- ders, most notably substance use disorders and depression (e.g., Kraines et al., 2019; Morris, Stewart, & Ham, 2005; Wittchen et al., 2003).

The above problems notwithstanding, perhaps the most devastating effect of SAD is on social relationships. At all levels of development, childhood, adolescence, and adulthood, individuals with SAD have significant relational problems arising from the fear that they will say or do something – or indeed that they have some deep personal flaw – that will elicit negative responses from others (e.g., Rodebaugh, 2009; Wilson & Rapee, 2004). Despite being around others, they often lack meaningful emotional contact with them. Not sur- prisingly, this process erodes their quality of life (Stein & Kean, 2000).

##### Developmental Roots of Social Anxiety Disorder

David Barlow, in his influential triple vulnerability model, proposed that anxiety disorders develop as a result of three factors, a generalized biological vulnerability, a generalized psychological vulnerability, and a specific psychological vulnerability (Barlow et al., 2014; Brown & Naragon‐Gainey, 2012). This model can be used to summarize what is known about the development of SAD. The generalized biological vulnerability in SAD is the innate tendency toward heightened physiological reactivity, which also underlies many other anxiety disor- ders and depression. Heritability estimates for the anxiety disorders, including SAD, have consistently been in the range of 20–40% with few defining genetic boundaries between most of these conditions (e.g., Smoller, Block & Young, 2009). Anxiety has been shown to be associated with certain brain circuits, most notably a *behavioral inhibition system* that leads from the septal and hippocampal limbic areas to the frontal cortex and is activated by unexpected events, resulting in heightened physiological reactivity (e.g., LeDoux, 2015). As dis- cussed elsewhere in this volume (Mumper & Klein, Chapter 7), this reactivity has been shown to underlie the tendency toward behavioral inhibition when the person is faced with unfamiliar events.

Adding to innate biological substrates is a generalized psychological sense of uncontrollability, a doubt about one’s ability to manage impending events (Gallagher et al., 2014). The belief that events are uncontrol- lable often arises from childhood experiences in which the person’s efforts actually were ineffective. Controlling and intrusive parenting can be one factor. For example, when mothers were assigned to behave in an overcon- trolling fashion when helping their children prepare for a speech task, their children displayed significantly more anxiety during the speech than did children whose mothers were more neutral (De Wilde & Rapee, 2008). Other adverse learning experiences can also be involved. Physical, sexual, and emotional abuse and physical neglect increase the likelihood of developing anxiety disorders and depression (Kuo et al., 2011; Li et al., 2016; Shahar et al., 2015). These early abuse experiences are believed to result in an internalized shame‐based self‐ schema that fuels self‐criticism, low self‐worth, and a sense of social inferiority, which are notable features of SAD (e.g., Fergus et al., 2010; Gilbert, 2000; Shahar et al., 2015).

The third vulnerability factor is individual learning experiences that link the general sense of threat, appre- hension, and uncontrollability to social situations. Some individuals with SAD have experienced a traumatic event that crystallized their anxiety around a certain type of situation, which can live on in the form of a dis- torted image of the self during the event (e.g., Krans et al., 2017; Schreiber & Steil, 2013). One example is a teenaged girl who was cruelly teased about her braces and awkward appearance by the “cool” boys in her junior high school class. Even when she became an attractive young woman, she had an intense fear of situa- tions involving same‐aged men and avoided them. A man whose third‐grade teacher laughed at him when he gave his first class speech developed a fear of speaking to groups in his workplace. A man whose father continu- ally compared him unfavorably to his brother developed the belief that everyone saw him as inferior. Other times, SAD can arise as people attempt to make sense of their innate sensitivity and inhibition and interpret these as evidence that they are different, odd, or awkward and that they must hide those symptoms from others. In short there is generally a learning history that shapes the nature of the person’s social fears (Weymouth et al., 2019).

These three vulnerability factors operate throughout the life span to affect the person’s ability to relate to others, beginning in childhood, intensifying in adolescence, and emerging in adulthood as a self‐perpetuating interpersonal cycle that impedes the normal pattern of relationship formation.

##### Social Anxiety in Childhood and Adolescence

Much of the existing research on childhood and adolescent SAD consists of a combination of clinical and non- clinical populations. In addition, there is substantial overlap between SAD and temperament‐related variables such as behavioral inhibition, shyness, and social withdrawal, with some researchers suggesting that the varia- bles may represent different points along the same spectrum (e.g., Coplan & Rubin, 2010; Heiser et al., 2009; Rapee & Coplan, 2010). Given the similarities, the term “socially anxious” will be used to encompass all of

these constructs. Early childhood events and parenting are covered elsewhere in this volume (Rubin, Chapter 29), and therefore, we will focus on social anxiety in school age children and youth.

In comparison to adults, who become increasingly able to choose their work and social environments as they age, children and adolescents are bound to the social environment of schools and mandated education. School environments often include mandatory class participation, public speaking tasks, group athletics, and relatively prescribed social atmospheres (e.g., eating in the cafeteria). On one hand, this situation provides children and adolescents ample access to social environments, an advantage that some socially isolated adults do not have access to. In contrast, they generally are not able to avoid undesirable social situations, such as peer victimiza- tion. As children enter the school environment, peer relationships become increasingly important to children’s social and emotional development, and peer variables such as peer acceptance and friendship support tend to have robust effects on child outcomes (Farmer et al., 2008; Festa & Ginsburg, 2011). In that vein, the presence of positive peer relationships at younger ages facilitates the transition into formal schooling and protects at‐risk children from becoming increasingly socially isolated and developing further internalizing symptoms (Ladd et al., 1996; Laursen et al., 2007).

As individuals enter adolescence, they begin to gain autonomy from their parents and to spend increasingly more time with peers, and therefore, peer relationships play an even more prominent role in their lives (Allison & Schultz, 2001; Grotevant et al., 1982). Adolescents tend to put great emphasis on being popular, as well as on the quality of their friendships and interpersonal interactions (LaFontana & Cillessen, 2010). Their peer group becomes one of the strongest determinants of psychosocial functioning and positive perception of the stability and intimacy of these relationships is associated with higher levels of self‐worth and positive social and emo- tional adjustment (Bukowski et al., 1993; Rubin et al., 2015).

It is now commonly recognized that social anxiety in youth is associated with significant impairment (Coplan et al., 2009; Coplan et al., 2016) in the form of difficulty with school attendance and lower educational attain- ment (for a review, see de Lijster et al., 2018). In addition, social anxiety tends to be relatively stable across time, and hence, related impairment may run a similar long‐term course (Beidel et al., 2001). If left untreated, social anxiety also puts youth at increased risk for future depression, suicide attempts, and substance abuse, as well as a broad range of other psychiatric disorders (e.g., Bittner et al., 2007; Essau et al., 2002; Kendall et al., 2004; Roza et al., 2003; Wittchen et al., 1999). Unfortunately, social anxiety often is not recognized by important adults such as parents and teachers (Rimm‐Kaufman et al., 2002). For example, in one study, children’s self‐ reported social anxiety was linked to various self‐reported negative outcomes including loneliness, school avoidance, and dislike of school; however, social anxiety was mostly unrelated to teacher‐reported outcomes (Weeks et al., 2009).

The most notable impact of social anxiety is on the nature of peer relationships. Socially anxious children often avoid and withdraw from social interactions due to fears of being negatively evaluated and/or rejected by peers (e.g., Thorell et al., 2004). Significant social avoidance emerges as early as age nine and continues throughout adolescence (Barzeva et al., 2019; Miers et al., 2014). In addition to avoidance, socially anxious chil- dren tend to be more withdrawn and inhibited than their non‐anxious classmates in general social situations (e.g., Coplan, Ooi, & Hipson, Chapter 8; Spence & Rapee, 2016; Wong & Rapee, 2016). Schneider (2009) found that even in friendly interactions involving “close friends,” anxious children were less assertive, had little to say, lacked the normative friendly competitive behaviors, and overall were less positive. Due to their fears, socially anxious children often fail to exhibit positive interpersonal behaviors. For example, these children display less social initiation, poorer social problem‐solving skills, and report lower orientation toward prosocial behaviors such as cooperation and helpfulness relative to non‐anxious children (e.g., Bohlin et al., 2000; Caspi et al., 1988). As one can surmise, avoidance generally leads to a limited overall number of social experiences.

Evidence also suggests that youth rate peers who show anxiety, are loners, are socially inhibited and shy, and who engage in behaviors characterized by unassertiveness and reduced prosociality to be less desirable across domains and are less willing to be friends with them (Fordham & Stevenson‐Hinde, 1999; Lau & Gruen, 1992; Luchetti & Rapee, 2014; Rubin & Burgess, 2001). Socially anxious adolescents display low ini- tiation of peer interactions, make shorter responses, and report being less likely to obtain positive responses from their social interactions (La Greca & Lopez, 1998). There is also evidence to suggest that anxious

children tend to be more passively isolated, rather than actively excluded (for a review, see Pickering et al., 2019). In studies that have used sociometric peer nominations, socially anxious children are often rated as unpopular or are neglected by other students (i.e., receiving fewer votes overall), and receive the lowest social impact scores (La Greca & Stone, 1993; Strauss et al., 1988). The lack of social contact may even be more deleterious as it can deprive them of opportunities to acquire and develop the social skills necessary to promote future relationship development (e.g., Hodges et al., 1999; Howes & Phillipsen, 1998; Schneider, 2009; Rubin et al., 2015).

Some authors further suggest that certain behaviors associated with social anxiety lead peers to actively exclude and victimize socially anxious children (Acquah et al., 2015; Ollendick & Hirshfeld‐Becker, 2002). Consistent with this proposal, youth reported that they would more likely victimize peers that show anxiety and anxious behaviors. Recent prospective studies found that social anxiety predicted increased peer victimiza- tion, whereas the ability to defend oneself predicted decreased victimization later in time (Gazelle & Faldowski, 2019; Luchetti & Rapee, 2014; Sugimura et al., 2017). Some findings reveal a bidirectional relation- ship between peer victimization and social anxiety across time (Pickering et al., 2019; Spence & Rapee, 2016; Wong & Rapee, 2016). In a recent prospective study that followed youth from kindergarten to the twelfth grade, researchers found that the trajectories of peer victimization co‐occurred with those of social anxiety (Ladd et al., 2019). As expected, youth who experienced chronic or low victimization developed high and low social anxiety, respectively, throughout school. More importantly, initially low socially anxious youth who expe- rienced increased victimization displayed increased social anxiety in the second half of their tenure. Interestingly, the social anxiety trajectory of youth who only experienced early victimization was not different than that of those who experienced low victimization throughout school. In another notable prospective study, researchers found both lower peer victimization and social anxiety after middle school transition, a time that involved an expanding social and changing social network (Shell et al., 2014). However, socially anxious children may strug- gle to adapt to new social networks (Nowland & Qualter, 2019). Recent studies also suggest that some mecha- nisms may play more prominent roles for girls versus boys (e.g., Pickering et al., 2019; Sugimura et al., 2017).

In sum, social anxiety can result in active exclusion, passive noninclusion, and a general lack of social engage- ment with peers. In turn, social isolation and avoidance prevent socially anxious individuals from developing the necessary interpersonal skills to reverse this pattern. Additionally, having often experienced adverse early social experiences, socially anxious youth are at risk for peer victimization, which further cements their social fears and avoidance.

The failure to develop peer relationships can lead to other negative emotional outcomes, most notably a pervasive sense of loneliness (see also Chapter 20). There is recent recognition that social anxiety and loneliness are two distinct but related constructs in youth (Danneel et al., 2019; Spence, Donovan, & Brechman‐Toussaint, 1999). A recent meta‐analysis found that social anxiety predicted later loneliness, and loneliness predicted later social anxiety, with the effects being invariant across age (Maes et al., 2019).

Socially anxious children often experience loneliness and isolation even with peers that they consider to be friends (e.g., Pickering et al., 2019). Overall, they tend to perceive lower friendship quality, lower levels of social support, and fewer positive interactions within their friendships (Festa & Ginsburg, 2011; La Greca & Harrison, 2005; La Greca & Lopez, 1998). These perceptions are particularly important given recent findings that close friendships may protect against feelings of loneliness and peer victimization in early adolescents with high levels of social anxiety (Erath et al., 2010). Despite these findings, many socially anx- ious children report not feeling close and/or comfortable with the friends that they have. Similarly, they report generally having fewer positive social responses and interactions with their peers (Spence et al., 1999).

There has been an explosion of recent research on the effect of the internet on social anxiety and loneli- ness, mostly using youth samples (for reviews, see Keles, McCrae, & Grealish, 2019; Nowland et al., 2017; Prizant et al., 2016; Tokunaga, 2012). On one hand, there were concerns about socially anxious and lonely youth relying too much on the comfort of the impersonal nature of the internet, which would displace real‐life social interactions. In contrast, many researchers see the internet as a viable means for socially anxious and lonely youth to connect with others and hopefully transition into real‐life social interactions.

A third perspective is that the internet is just another medium through which preexisting psychosocial problems such as social anxiety, loneliness, and victimization may manifest (see Chapter 20 for a detailed discussion). Currently, there is consensus among researchers that the relations between social anxiety, lone- liness, and the internet are very complex, and future research will elucidate the precise effect of the inter- net depending on the internet medium (e.g., messaging, gaming) and the intended purpose among other factors.

To summarize, social anxiety can result in dysfunctional peer relationships in childhood and adolescence, which in turn, perpetuate or even heighten later social anxiety and avoidance, thus forming a vicious cycle of negative behaviors and rejection that creates an ongoing sense of loneliness and emotional isolation (e.g., Gazelle & Ladd, 2003; Ladd et al., 2019; Spence & Rapee, 2016; Wong & Rapee, 2016). As a result, socially anxious youth leave adolescence ill‐prepared to navigate the tasks of adulthood.

##### Social Anxiety in Young Adults

Erik Erickson, the prominent developmental psychologist, observed that the critical task in late adolescence and young adulthood is the development of a basic sense of personal identity, that is, of one’s personal beliefs, goals, values, and career interests (e.g., Erikson, 1980). Erickson proposed that the ability to develop intimate relationships is dependent in part on a clear sense of one’s identity. Personal identity is constructed in part through observations and interactions with others, which reveal to individuals how they are similar and distinct from significant others, helping to clarify their unique self (e.g., Andersen & Chen, 2002).

The self‐perpetuating interpersonal cycle described above strikes at the heart of the person’s sense of self. Limited and often less positive social experiences in childhood and adolescence leave young adults with SAD less well prepared to navigate the process of identity formation. Studies show that these individuals tend to lack a clear sense of self (Stopa et al., 2010). Moreover, adverse social‐developmental experiences result in low self‐ worth, a shame‐based sense of self, and an ongoing pattern of self‐criticism (e.g., Alden et al., 2014; Shahar et al., 2015). The evolutionary theorist Paul Gilbert proposed that social anxiety and the accompanying strong sense of shame leads the person to view the world in terms of a status hierarchy. Perceiving themselves to have low social rank, they engage in submissive, withdrawn behavior to prevent being further excluded by the group (Gilbert, 2000). All in all, the person is not sure who they are but they are certain that they are less worthwhile than others.

##### Social Anxiety and Relational Behaviors in Adults

The patterns established in adolescence and young adulthood often crystalize in adulthood where SAD is associated with both structural and emotional social isolation. Adults with SAD are consistently found to have smaller social networks than non‐anxious controls and even many clinical groups (e.g., Dahl & Dahl, 2010; Davidson et al., 1994). SAD symptom severity is associated with greater risk of living alone, having fewer friends, and lower involvement in club or association activities (Dahl & Dahl, 2010). Nearly half of individuals with SAD are either single, not married, or never married (Teo et al., 2013), and even if married, tend to be less satisfied with their partners or to experience marital distress (e.g., Whisman, 2007). These individuals are more likely to report having no *close* friends and are less satisfied with the quality of the friendships they do have even relative to individuals with other anxiety disorders (e.g., Chou et al., 2011; Rodebaugh, 2009). These findings raise the question of how it is that individuals with SAD, who desire close relationships, are unable to develop them.

According to relational writers, the development of the satisfying relationships necessary to construct a positive sense of self is dependent on open and genuine expression of one’s emotions and opinions to oth- ers and encouraging them to do the same (e.g., Collins & Miller, 1994; Laurenceau et al., 1998; Reis & Shaver, 1988). Reciprocal self‐disclosure fosters a sense of similarity and mutual trust that motivates people to seek ongoing contact and produces the friendships and romantic relationships that help us to understand and value ourselves. Self‐disclosure reflects the broader concept of *authenticity*, or acting in accordance

with one’s “true” self (Brunell et al., 2010). Authenticity has been linked to a sense of social relatedness, higher self‐esteem, and greater self‐concept clarity (e.g., Leary, 2003). Interestingly, we feel more authentic when we engage in extraverted behavior (Fleeson & Wilt, 2010). People higher in authenticity are less likely to be social chameleons who present different faces to different people (Leary & Allen, 2011). Moreover, social validation of the authentic self reduces the defensive behaviors that disrupt relationships (e.g., Schimel et al., 2001).

Another important relational building factor is responsiveness. Partner responsiveness to another’s self‐ disclosures results in the other person feeling understood, which contributes to intimacy and perceived social relatedness beyond self‐disclosure alone (e.g., Laurenceau et al., 1998). Together, self‐disclosure and partner responsiveness facilitate rapport in interactions between unacquainted strangers (Butler et al., 2003) and contribute to feelings of intimacy in dating and married couples (e.g., Lippert & Prager, 2001).

The development of trust is a particularly important process in *intimate* relationships (e.g., dating/marriage) (e.g., Murray et al., 2006). In successful intimate relationships, a person comes to trust that their partner loves and values them and experiences a sense of *felt security*. Perceptions of partner love are partly contingent on the belief that one’s partner sees positive qualities in one’s self. In more positive romantic relationships, people project positivity onto their partner (i.e., believe that their partner values and loves them even at times when the behavioral cues are less clear). Important for our purposes, self‐doubts tend to weaken the cognitive and behavioral processes associated with trust. Individuals with negative self‐views were found to underestimate their partner’s love, although they were actually loved just as much as individuals with positive self‐regard (Murray et al., 2001). Furthermore, individuals who (incorrectly) felt less loved perceived their partners less positively, a tendency that can lead to emotional distancing from the relationship (Murray et al., 2001). In short, people with negative self‐beliefs have difficulty fulfilling their need for security and belonging even in relation- ships with loving, committed partners.

The fear and self‐doubts experienced by socially anxious people appear to undermine these critical rela- tional processes. Laboratory studies reveal that socially anxious individuals are less likely to reciprocate the self‐disclosure of their conversational partners and, in turn, their partners are less interested in future con- tact with them (Meleshko & Alden, 1993). Vonken and her colleagues (Vonken et al., 2008) used structural equation modeling (SEM) to outline the sequence of events linking behavior to social rejection. Patients with SAD evoked negative emotional reactions in both their conversational partners and objective observ- ers, which led to perceptions of dissimilarity. Together, partners’ negative emotions and perceptions of dissimilarity predicted rejection of SAD participants. Heerey and Kring (2007) found that conversational partners of socially anxious students failed to experience the increase in positive affect found in partners of nonsocially anxious students.

Similar deficiencies in emotional disclosure are also observed in relationships outside the lab. Students with social anxiety reported avoidance of expressing emotion, lack of assertion, and interpersonal dependency in their interactions with family and friends (Grant et al., 2007). Furthermore, avoidance of emotional expression predicted increases in depressive symptoms one year later (Grant et al., 2007). Emotional dissatisfaction is also found in clinical samples. Sparrevohn and Rapee (2009) found that compared to controls, patients with SAD felt less able to self‐disclose and express emotions within their romantic relationships. Subsequent work suggested that this pattern may be stronger for women (Cuming & Rapee, 2010). Given the role of self‐disclosure in creat- ing intimacy, it is not surprising that both a lack of self‐disclosure and emotional expression were associated with lower perceived social support.

The picture that emerges from these studies is that lack of openness shuts off the development of emo- tional intimacy in adults. It is important to note that this pattern emerges more strongly when socially anxious people are threatened with negative evaluation. When perceived threat is reduced, socially anxious people readily engage in self‐disclosure and subsequently elicit the same level of partner liking as non‐anx- ious people (e.g., Alden & Bieling, 1998; Russell et al., 2011). These findings indicate that socially anxious individuals have the ability to be open and friendly toward others but that these behaviors are inhibited when they fear negative evaluation with corresponding relational decrements. Another set of studies revealed that individuals with SAD were more accurate at judging another person’s negative emotions (i.e.,

displayed greater empathic accuracy relative to non‐anxious controls). However, when they were asked what suggestions they would have for the distressed other, they were less likely to provide relationship‐ building advice (Auyeung & Alden, 2020). The core problem appeared to be an inability to use their emo- tional awareness to promote prosocial actions rather than a lack of empathy toward others.

##### Safety‐Seeking and Relationships

A growing body of work suggests that deficiencies in prosocial behavior arise in part because individuals with SAD have learned to adopt a self‐protective approach to social interactions in an attempt to shield themselves from further social injury. Contemporary theories center on the way in which self‐protective motives drive cognitive and behavioral processes.

Cognitive‐behavioral writers propose that individuals with SAD engage in dysfunctional social behaviors, not because they lack social knowledge or skill, but because a chain of cognitive processes maintains their fears and poisons their social interactions (Clark & Wells, 1995; Rapee & Heimberg, 1997). Specifically, their negative self‐beliefs lead to selective attention to threat cues and biases their predictions and judgments about social events, thereby maintaining their fears and negative self‐views (e.g., Weeks et al., 2016). For example, individu- als with SAD tend to underestimate their social performance and others’ liking for them, which seems likely to impede their ability to trust others and emotionally connect with them (e.g., Alden & Wallace, 1995; Rapee & Lim, 1992). Notably, individuals with SAD even interpret positive social responses as threatening because they believe others will now expect more from them and they will fail to meet those expectations (Alden et al., 2008; Reichenberger & Blechert, 2017). Thus, these individuals become anxious when faced with positive social over- tures from others.

Of particular relevance to the interpersonal realm is evidence that these cognitive processes lead socially anxious individuals to engage in *safety‐seeking behaviors* (safety behaviors). Safety behaviors are overt or covert acts intended to manage or avert perceived threat and increase a sense of safety; however, because these behav- iors are based on an exaggerated sense of social threat, they are unnecessary and actually work to perpetuate social fears (Clark & Wells, 1995). Our research group has been particularly interested in how safety‐seeking affects interpersonal interactions. Somewhat surprisingly, we found that patients with SAD are able to identify their habitual SSBs – these are not deeply unconscious defenses. The most common safety behaviors reflect themes of avoidance and impression‐management (Plasencia et al., 2011). Avoidance includes such actions as limiting speech, avoiding eye contact, and low self‐disclosure, essentially attempting to hide the self. Impression management includes attempts to tightly monitor and control one’s behavior so as not to show anxiety, over‐ preparation (e.g., rehearsing what to say before and during social interactions), and feigned friendliness. These behaviors function to present an “artificial self ” that the person believes will be less likely to evoke rejection. Both self‐concealment and impression‐management can be viewed as *relational strategies* (i.e., global behavioral strategies for managing perceived social threats).

Importantly, both strategies are associated with negative social outcomes. Conversational partners of patients who used avoidance were less interested in future interactions, which supports the idea that avoidance leads others to disengage from closer relationships. Reliance on impression management, in contrast, resulted in higher estimated costs of future negative outcomes, or, in other words, these individuals felt they had more to lose if they were unable to maintain the facade the next time they talked with their partner. Notably, both strategies were associated with a subjective sense of inauthenticity (i.e., the person recognized that their behav- ior was “fake”). In light of relational research underscoring emotional expression and authenticity, these behav- iors clearly would be expected to impede relationship development. Further, even if interactions go well, one would expect little change in the negative self‐views at the root of SAD since any positive feedback would not pertain to the genuine self.

To directly examine the effects of reducing SSBs on social outcomes, we asked one group of patients with SAD to eliminate their SSBS prior to a second interaction with a conversational partner (Taylor & Alden, 2010, 2011). It is notable that most patients were able to do so. Moreover, their partners’ perceptions of them changed for the better, and they became more interested in subsequent interactions, whereas no

improvement in social outcomes was observed for controls (Taylor & Alden, 2011). Thus, safety behaviors appear to link negative self‐beliefs to poor relational outcomes. These findings indicate that if individuals with SAD can be helped to recognize that they are not deeply flawed but rather that their adoption of safety strategies emotionally isolates them from other people, they may be able to alter those patterns and estab- lish the close relationships they need to lead more satisfying lives (Alden & Taylor, 2011).

To explore this possibility, we developed and evaluated a treatment protocol based in part on relational mod- els. Discussion and activities that encouraged self‐disclosure, responsiveness to others, and authentic self‐ expression were incorporated into a basic exposure regimen. Results of the 12‐week treatment indicated that the relationally enhanced treatment was significantly more effective than graduated exposure alone or a wait list control, and notably increased patients’ social initiation behaviors and satisfaction with encounters with unfamiliar people (Alden et al., 2018). Taylor and colleagues had individuals with SAD engage in an interaction task that increased self‐disclosure and found that enhanced self‐disclosure led to an increase in a sense of social connectedness and greater desire to engage in further interactions with their partner (Taylor et al., 2017). Importantly, change in social connectedness was mediated by increases in positive affect rather than reductions in anxiety. These findings again suggest that enhancing relational behaviors has the potential to build the satis- fying relationships necessary to overcome social isolation. The importance of including relational strategies is underscored by research indicating that individuals with SAD often remain lonely even following traditional treatment regimens (e.g., Suveg et al., 2017).

##### Future Directions

A theme running throughout this chapter is that social anxiety and SAD impede the types of prosocial behaviors essential to the development of close relationships and a sense of social connection. Extant research has tended to focus on reducing negative behaviors, avoidance, safety‐seeking, and so on, assuming that reducing anxiety and avoidance will spontaneously increase social approach behaviors. We need to con- sider whether our interventions might benefit from incorporating strategies that enhance key relational behaviors like social initiation, self‐disclosure, and empathic awareness of others. Relational and interper- sonal research has identified basic principles and processes critical to good relational functioning that might guide our efforts. Given increased awareness of social anxiety in children and adolescents, another direction for future work is to identify interventions targeted at these groups in order to prevent the harm arising from severe social anxiety and to help these young people develop satisfying friendships that help to overcome their emotional isolation.

##### Summary

In this chapter, we have attempted to articulate the relational difficulties associated with social anxiety and SAD across the life span and also to explain how people with SAD unwittingly engage in behaviors that interfere with authentic self‐expression and short‐circuit relationship development, thereby cutting off the social con- nections that might modify their negative self‐beliefs and fears. The end result is that they often live in a state of emotional solitude – alone in the crowd.

# Hikikomori: Risks and Consequences of Extreme Self‐imposed Social Marginalization

##### Introduction

In the first edition of this handbook, Teo, Stufflebam, and Kato (2014) introduced readers to the *hikikomori* or prolonged social withdrawal phenomenon in Japan (note: the two words/phrases will be used interchangeably throughout this chapter).\* In the past decade, similar phenomena have been identified in other Asian countries (notably China, Hong Kong, Singapore, Taiwan, and South Korea) and in non‐Asian countries (for example, Italy, Spain, the United States, and Oman). Thus, hikikomori is an emerging international clinical and research area, although, currently, only a limited number of empirical studies have been conducted outside of Japan.

Our chapter will begin with an overview of young people in high‐income countries because hikikomori is generally seen as an emerging youth issue highly related to globalization and urbanization. It will then provide a review of the most recent hikikomori studies that have been conducted internationally. We will also intro- duce our proposed theoretical model of this behavior and its application. We hope that, as a result of reading this chapter, readers will appreciate the complexity and challenges inherent in understanding people who engage in prolonged social withdrawal, and also be excited for further examination and treatment of this emerging youth phenomenon.

##### The Well‐Being of Young People Who Live in High‐Income Countries

More than half of the current global population is made up of individuals, who are aged 30 years and younger (Bulc et al., 2019). It is noteworthy that, among the 1.8 billion young people in the world, aged between 10 and 24 years, about 10% live in high‐income countries. The potential risks to health and bio‐psycho‐social well‐ being of this 10% can be very different from those who reside in low‐ and middle‐income countries. For instance, in high‐income countries, earlier puberty, because of improvements in childhood hygiene and nutri- tion, and postponed contemporary social‐role transitions (e.g., longer engagement in education and delayed employment and marriage), have resulted in an increase in the time span of adolescence. A lengthened adoles- cence that now extends into their early thirties may make youth more susceptible to mental and behavioral problems in this globalized, high‐speed, and information and communication technology–driven era.

It is noteworthy that the significant medical advancements and improvements in social environments in high‐income societies have led to improvements in detection and treatment of physical disorders of many indi- viduals. However, improvements in the mental well‐being of adolescents have not occurred (Patton et al., 2016). Instead, noncommunicable diseases associated with mental and behavioral problems, such as physical inactiv- ity, obesity, smoking, violence and substance abuse, and suicidal behaviors, have increased in recent years and had adverse effects on adolescent mortality and morbidity (Catalano et al., 2012).

In addition, the social well‐being of the younger people in high‐income countries has not improved. For example, following the global financial tsunami in 2008, youth unemployment has become a serious problem. The Organization for Economic Co‐operation and Development (OECD) found that, in 2017, in OECD coun- tries, such as Finland, Italy, Poland, and the United Kingdom, the percentage of 18–24‐year‐old youths who were not in education, employment, or training (NEET) had reached 14.3%. The European Union (EU) reported that, in 2018, 16.5% (around 5.2 million) of the 20–34‐year‐olds living within the EU could be classified as NEET (Batini et al., 2017). This is worrisome as long‐term unemployment can lead to socio‐political‐educa- tional disengagement as well as marginalization, dependence, loneliness, increased drug use, criminal activity, distrust of authorities and governments, and self‐harm/suicide (Uchida & Norasakkunkit, 2015; Wong et al., 2015).

It has been asserted that the aforementioned recent, constant, and rapid social and economic changes in high‐income societies are also responsible for the worsening income inequality, increasing rates of single par- enting, and increasing pressure and competition in education and employment (Bor et al., 2014). Of course, young people are still subject to traditional risk behaviors and developmental challenges (e.g., drug dependence and addiction, and suicidal behaviors). However, the rapid and complex social and technological changes in this century would seem to have spawned a range of new, often deep‐seated, psychosocial problems, including *hikikomori*, which are affecting far too many youths and their caregivers in high‐income countries (Arnett et al., 2014; Bor et al., 2014).

##### Hikikomori – Prolonged Socially Withdrawn Individuals

Among the aforementioned NEET young people, one group of them who experiences a prolonged period of social withdrawal for six months or longer, has little to no social interaction, but, without any *severe* psychiatric disorders, have been referred to as *hikikomori* in Japan (Kato et al., 2012; Teo & Gaw, 2010; Watts, 2002). *Hikikomori* was initially thought to be a Japanese phenomenon because of Japan’s specific cultural practices, and historical and economic circumstances (Furlong, 2008; Teo & Gaw, 2010). In the past decade, however, there has been an increase in the identification of similar cases through the use of different research method- ologies in other Asian countries, including China (Liu et al., 2018; Wong et al., 2017), Hong Kong (Chan & Lo, 2014a; Wong et al., 2015), Singapore (Bowker et al., 2019), and South Korea (Lee et al., 2013), Taiwan (Wu et al., 2019), as well as *non*‐Asian countries, including Italy (Ranieri, 2015), Oman (Sakamoto et al., 2005), the United States (Bowker et al., 2019), and Spain (Malagon‐Amor et al., 2015; Ovejero et al., 2014).

The prevalence of prolonged socially withdrawn behavior or hikikomori, however, has not been the subject of research in most countries for two probable reasons: (1) a lack of global consensus with respect to a research definition and diagnostic criteria; and (2) more importantly, the extreme challenges, which confront research teams with respect to the identification of, and engagement with, people who withdraw from society for extended period of time.

*The evolution of the definition and classification of hikikomori.* Saito (1998), considered to be one of the foremost scholars with respect to hikikomori studies, first described hikikomori as young people who withdraw from society at their own homes for at least six months and whose withdrawal behavior does not seem to be explained by psychiatric disorders. However, his description of hikikomori has been challenged, especially from a diagnostic perspective, because it was difficult to define what is meant by for “whom other psychiatric disorders do not better explain the primary symptom of withdrawal” (Teo & Gaw, 2010, p. 444).

In 2010, in an attempt to offer a more acceptable definition for evaluation and, thus, garner further support for the development of services for hikikomori in Japan, the Ministry of Health, Labour, and Welfare (MHLW) suggested that hikikomori could be better described as home‐bound withdrawn behavior from social relation- ships, employment, and other types of social participation, for a period of more than six months. In general, hikikomori today is considered to be a nonpsychotic phenomenon that is distinguishable from the withdrawal state based on the positive or negative symptoms of schizophrenia (cited in Kato et al., 2019).

There are only two prevalence studies have been conducted to study the scope of the hikikomori phenome- non using the abovementioned definition. Koyama, Kawakami, and colleagues (2010) conducted a face‐to‐face household survey in 12 cities in Japan. The survey revealed that among approximately 4,000 respondents, a total of 19 participants (1.2%) had experienced “hikikomori” in their lifetimes, half of whom were classified as “pri- mary hikikomori,” or without a corresponding comorbid psychiatric disorder. In Hong Kong, because there was insufficient funding available in order to conduct a household survey, a cross‐sectional telephone study was employed. This study found that the prevalence rate of more than six months social withdrawal among people aged 12–29 years was similar at 1.9%. Indeed, Wong and colleagues estimated that between 16,900 and 41,000 of approximately 1 million young people in that cohort in Hong Kong may exhibit or have exhibited prolonged socially withdrawn behavior for six months or longer (Wong et al., 2015).

*The challenges faced by research and clinical teams in the identification of hikikomori as research participants.* The hikikomori population is, by definition, incommunicado, and as such, extremely averse to clinical and social contact (Bowker, 2016). Many parents, especially in Asian countries, are reluctant to participate in surveys or ask for the direct intervention of professional support for their children who are suffering from prolonged socially withdrawn behavior. They feel that their good names will be sullied if relations and neighbors become aware of their children’s behaviors and mental states. Again, if parents do not seek active, professional support, it is very difficult, indeed almost impossible, for mental health professionals, especially social workers, to know that there are individual sufferers withdrawing to their rooms inside the homes of their parents. There is also the challenge for social workers and other related health professionals to develop strategies to break down those defensive barriers erected by youth suffering from hikikomori and to engage in emphatic dialogue with them.

Accordingly, various innovative research methodologies have recently been employed in order to identify those individuals best suited to participate in hikikomori studies. In studies emanating from China, for example, social media, social networking and gaming websites are used to recruit participants (Liu et al., 2018). In Taiwan, popular Taiwanese websites and social media, including Facebook, Bulletin Board Systems, university websites, and online forums are used (Wu et al., 2020). These two studies adopted the definition that, to be identified as persons with prolonged social withdrawal, they must have: (1) physical isolation or withdrawal to a particular place; (2) lack of social connectedness and interaction; and (3) duration of social withdrawal of at least three months. In one recent comparative study, involving the self‐reporting of university students from Nigeria, Singapore, and the United States, to be identified as hikikomori, candidates had to have experienced a period of social withdrawal for six months or longer, did not go to work or school, only had the occasional or very occa- sional excursion or trip outside the home or other place of self‐exclusion, and did not communicate with people, except for family members (Bowker et al., 2019). A recent study adopted a mixed methods analysis of all publicly available tweets using the hashtag #hikikomori in five Western languages (Catalan, English, French, Italian, and Spanish), the study found that hikikomori is a repeated word in non‐Japanese Western languages on Twitter, suggesting the presence of hikikomori in countries outside Japan (Pereira‐Sanchez et al., 2019).

In summary, an increasing incidence and range of research has suggested that the issue of hikikomori or people with prolonged and pathological social withdrawal behavior is a global issue, especially in high‐income countries, where some young people can survive with parental support without leaving their homes in the urban areas. Certainly, it is an escalating problem, highlighted as part of a worldwide call for better investment in adolescent health and well‐being (Patton et al., 2016). However, at this stage, it is inadvisable to make strong generalizations about hikikomori across countries and cultures until more reliable and valid identification tools, which are culturally sensitive, are developed, rigorously evaluated, and readily available.

##### Theoretical Understandings of Hikikomori

The development of hikikomori has been explained from two broad perspectives. The *clinical* perspective suggests that hikikomori coexists with a variety of psychiatric conditions, including adjustment disorders, anxiety‐related disorders, autism spectrum disorders, major depressive disorder, post‐traumatic disorder,

schizophrenia and psychotic disorders, and physical conditions, including pain and fatigue or chronic fatigue syndrome, skin diseases, and gastrointestinal diseases (Furlong, 2008; Kato et al., 2019; Koyama, Kawakami et al., 2010; Malagon et al., 2010; Pozza et al., 2019; Tateno et al., 2013). The pathophysiology of hikikomori is, as yet, not well understood, and effective interventions have yet to be established. Kato and colleagues (2019) hypothesized that inflammation and oxidative stress may be linked to the underlying pathophysiology of hikikomori, as is the case with other psychiatric illnesses. It is noteworthy that the relationship between this form of socially withdrawn behavior and psychiatric illnesses is still very prelimi- nary and, hence, whether the classification of primary hikikomori (withdrawn without psychiatric ill- nesses) versus secondary hikikomori (withdrawn without psychiatric illnesses) should continue in assessment and research is still very much under debate among academics and clinical professionals.

From *nonclinical* perspectives, some researchers have considered prolonged social withdrawal from social constructionist (Horiguchi, 2015), social‐cultural (Borovoy, 2008, 2010), and psychological frameworks (Uchida, 2010; Uchida & Norasakkunkit, 2015). This section of the chapter aims to review some of these non- clinical perspectives in order to broaden the reader’s appreciation of the nature of prolonged socially with- drawn behavior.

*Psychological perspectives.* Hattori (2006), in his qualitative study, first related hikikomori to insecure attachment. Krieg and Dickie (2013) further examined this empirically and found a significant association between hikikomori and insecure attachment using path analysis. Based on Bowlby’s attachment theory (1969), they suggested that, in general, socially withdrawn youths normally have developed an ambivalent attachment style with their principal caregivers and that was the main factor contributing to their developmental problems. Kasahara (1984) has attempted to explain hikikomori using Erikson’s developmental theory. In sum, Erikson (1950, 1968) proposed eight psychosocial stages in the life cycle of human beings, from infancy to late adulthood. At each stage, the developing individual is confronted with a psychosocial crisis of two conflicting forces, which can be biological or sociocultural. Kasahara (1984) suggested that hikikomori may result from the failure to confront and resolve crises in Stages 5 and 6 of the Erickson’s psychosocial stages. The intimacy versus isolation conflict, at Stage 6, is emphasized at the young adulthood stage. Intuitively, the individual, who fails to achieve intimacy at the young adulthood stage, may suffer from isolation and hence develop prolonged social withdrawal (Koyama, Kawakami et al., 2010; Koyama, Miyake et al., 2010). However, the negative consequence of isolation at the young adulthood stage may not alone fully explain the onset of hikikomori in adolescence. Some researchers have, therefore, suggested that identity crisis at the adolescence stage, Stage 5, may also lead to hikikomori (Furlong, 2008).

*The sociocultural perspective.* Some sociologists have considered hikikomori in relation to societal aspects of globalization and interdependence‐oriented culture, especially in Asian countries (Toivonen et al., 2011). Globalization forces put tremendous pressures on young people to be more competitive and flexible in the labor market, while, at the same time, the East Asian culture value of harmony‐seeking remains intact, even dominant. Therefore, young people may be caught between institutional resistance (such as the rapidly transforming labor market) and a rigid social expectation on them to achieve a “successful” adulthood. Socially withdrawn youths seem to be trapped in a dilemma between the inability to conform and an unwillingness to rebel, leading to marginalization in society (Horiguchi, 2015), but this speculation has yet to be tested empirically.

##### The Three‐Process Framework of Hikikomori: Risks and Consequences

We summarized previous utilized perspectives of and findings of the risks and consequences on hikikomori to develop our conceptual framework that views the hikikomori phenomenon as a result of the interplay among psychological, social, and behavioral factors (Li & Wong, 2015a, 2015b). Instead of regarding hikikomori as either a negative consequence of insecure attachment (Hattori, 2006; Krieg & Dickie, 2013) or an essential

self‐seeking process in a transitional period (Chan & Lo, 2014b; Furlong, 2008), we proposed a more balanced view to best conceptualize the risks and consequences of hikikomori. The conceptual framework considers three social withdrawal processes and suggests three main types of withdrawn young people, emanating from the family, the school, and society at large (see Figure 27.1).

*The pathway to hikikomori: the family.* The first pathway pertains to the family. Hikikomori are frequently the product of overprotective families. Such overprotection appears to hinder their psychosocial development. In such an environment, they have difficulties in learning how to trust people and gain autonomy. While their family provides adequate tangible resources, these youths do not have the motivation to engage in risk‐taking situations with respect to the outside world. Indeed, risk‐taking may also be viewed by their parents as dangerous and hurtful. In addition, the dysfunctional family dynamics and other forms of poor parenting worsen the situations in which young people lack secure attachments and do not have opportunities to learn appropriate intra‐and‐interpersonal skills at home. Also, in families where the expectations for the children to become extremely successful may also contribute to the development of hikikomori. When the children are highly expected by their parents and themselves to be extremely successful but fail, the young people may not be willing to attempt again. So instead, some of the withdrawn young people have chosen to live in the “virtual world” where they perceive it as a relatively safe platform through which they can satisfy their natural need of exploration. Also, in the virtual world, they can hide their real identity and hide themselves from any discussions whenever they want to. In other words, the virtual world has provided them a comfort zone where they have more control than the “actual” world.

*The pathway to hikikomori: schooling.* Because they have not developed appropriate intra‐and interpersonal skills at home, very often those who eventually become hikikomori do not develop healthy and satisfactory relationships with peers and teachers at schools. Unfortunately, without maintaining good peer support and networks, they may encounter various problems at school such as bullying, especially cyberbullying. Japan (as is Hong Kong and South Korea, for example) is very much exam‐oriented in its approach to education. If socially inept students have learning difficulties and/or perform poorly or at an average level in terms of academic achievement, they may feel or be made to feel that they have let their parents down. Out of shame, they may then retreat to the inner sanctums of their homes.

The challenges in school life and the lack of appropriate attention in both the family and school settings and with little or no follow‐up by teaching professionals can lead to school dropout. Nevertheless, they still have the desire to connect with the extended world outside the family and, in most cases, when they first drop out, attempt to meet existing school‐based friends or find new friends. However, their withdrawal behavior interferes with the formation of meaningful friendships. This is because they have fewer opportunities to communicate with people and have fewer common experiences to share with their friends, most of whom are still in school.

*The pathway to hikikomori: societal factors.* Kato and colleagues (2019) recently claim that hikikomori is a “modern society‐bound syndrome.” Some socially withdrawn youths typically spend much time studying and planning for their futures, but their subsequent unemployment or underemployment, due to keen competition, make them even more frustrated. Therefore, they may enjoy or indulge in social withdrawal as a paused moment for personal growth or the search for the meaning of life. It is worth mentioning that some may leave their withdrawal stage when they have decided what to pursue for their future; however, some may have been withdrawn for too long and their motivations and life skills for searching for future education or employment have completely diminished (Li et al., 2018).

*The application of the proposed framework in Hong Kong.* The proposed framework expands the current knowledge regarding the nature of hikikomori and the practices by offering a more holistic perspective, which we believe should be utilized in clinical interventions by (1) matching socially withdrawn youths with appropriate

interventions and (2) creating new and innovative engagement strategies, based on current understandings of the different social withdrawal processes. Indeed, we believe that some youth will withdraw due to one, two, or three of the aforementioned factors, and thus, interventions should be tailored accordingly. Since 2010, we have collaborated with the Chinese Evangelical Zion Children and Youth Integrated Service Centre in Hong Kong in order to develop and evaluate a pilot multicomponent intervention for socially withdrawn young people in Hong Kong that was based on an earlier version of the proposed model. This program, named “Regain Momentum,” adopted a case management model aimed at addressing a wide range of concerns and needs of the socially withdrawn young people, including self‐esteem, social needs, and employment. In doing so, the social workers would select the appropriate components of the program according to the type of withdrawn category, namely overdependent (i.e., impacted by the family), maladaptive interdependent (i.e., impacted by the family and school), and counter‐dependent (i.e., impacted by the family, school, and society; shown in Figure 27.1), the withdrawn behaviors and thoughts, and their motivation to change.

Animal‐assisted therapy (AAT) with trained dogs and job training were developed as core components of this *Regain Momentum* (RM) program. Components of the program included four non‐AAT components and four AAT components. The *Pet Partners’* (previously Delta Society) definition of AAT was used to guide the design of the AAT components: “animal‐assisted therapy as a goal oriented, planned, structured and docu- mented therapeutic intervention directed by health and human service providers as part of their profession” (Pet Partners, 2019). The non‐AAT components included: (1) a hotline for referrers, parents, and socially with- drawn youths; (2) referrals for further clinical assessment; (3) three to five face‐to‐face, individual counselling sessions with social workers, either at home or at the center; and (4) support groups led by professionals. The AAT components included: (5) AAT in the form of individual counselling and small group activities with the therapy dog as a support to the trained social worker; (6) AAT in the form of social gatherings with dogs and volunteers from several dog visitation agencies; (7) a pre‐employment training program focused on companion animal grooming; and (8) a pre‐employment training program focused on taking care of the therapy dog at the youth center (Wong et al., 2017).

As a case management model was adopted, the mobilization and coordination of various service compo- nents were tailor‐made to the participants’ needs. The social workers, who were responsible for the intake, would collect the information about the potential participants and match their profiles, based on our proposed model. An individual plan was constructed for each participant. In general, participants in the RM program received all the non‐AAT components (one to four). They were then invited to receive the AAT components (five to eight) on a voluntary basis since not all the participants in the RM program opted to complete the AAT components, for reasons such as cultural beliefs, previous negative experiences with animals, or potential aller- gies to animals.

The combination of the service components was tailor made and formulated in conjunction with the par- ticipant in order to meet her/his personal goals. AAT was carried out by qualified social workers under the close supervision of a specialist psychiatrist who conducted a monthly case conference in order to discuss and review the progress of the cases and to further identify psychosocial factors underlying the social withdrawal behaviors of individual clients. A multicomponent model was developed because we acknowledged the hetero- geneity of the withdrawn young people and the fact that the fulfilment of their needs required different levels and types of engagement and interventions.

During 2010–2012, a total of 115 youths who were either referred by parents or professionals participated in the pilot RM program. Among them, 56 consented to take part in the research study and completed both the pre‐ and post‐questionnaires. The percentages of male and female study participants were 66.1% and 33.9%, respectively. Around 16% (*n* = 9) of the participants were older than 25 years and 7% (*n* = 4) were younger than 14 years old. Fifty‐two (92.9%) were eligible to participate in the labor force, but 79% were unemployed at intake. About 70% (*n* = 39) were considered to be primary hikikomori; 22 of these subjects participated in the AAT, and 17 did not. About 30% (*n* = 17) were withdrawn individuals with mental health problems and were considered to be secondary hikikomori; 15 of these subjects participated in the AAT, and 2 did not. Depressive or anxiety disorders (41%, *n* = 7) and psychosis (23%, *n* = 4) were the most common disorders among those with mental health problems.

After participation, we observed decreased levels of social anxiety and increased levels of perceived employabil- ity and self‐esteem across both the AAT and non‐AAT groups. The components of AAT did not seem to have additional positive impacts on outcomes of the AAT group when compared with the non‐AAT group. The quali- tative data collected through interviews with ten participants, however, reflected that the AAT component was attractive because the animals made them feel respected, engaged, and loved. This pilot study showed that a mul- ticomponent program with a case management model correlated with increased levels of self‐esteem and per- ceived employability and a decreased level of social interaction anxiety. In addition, the use of animals in a social service setting appears to be an effective strategy with respect to engaging difficult‐to‐engage young people.

##### Challenges and Future Directions

We have reviewed and summarized some of the most recent international studies on hikikomori in this chap- ter. The fact that the number and the quality of the recent studies have increased is exciting and motivating. Below are some of the challenges or obstacles that researchers in this field need to urgently address in order to further expand our understanding of hikikomori and increase the number and type of interventions.

*Quantifying withdrawal behavior as a burden of disability.* Although Wong and colleagues (2015) found that some socially withdrawn youths enjoyed the same level of mental health as non‐withdrawn individuals because they believe that their withdrawal behavior is non‐problematic, the fact is that a large percentage of socially withdrawn youths suffered from poor mental health. Thus, the onset of hikikomori in the adolescence stage may result in an increased demand on existing mental health services, thereby adversely affecting the level of care that can be accessed by other mental health clients. The burden of hikikomori is not only medical (i.e., potential cost for health services) but also social and economic. The disability‐adjusted life year (DALY) is used by health professionals and policymakers to quantify and assess the overall disease burden, expressed as the number of years lost due to diseases, disability, or premature death (Devleesschauwer et al., 2014). To calculate DALYs, it is important that there are accurate statistics with respect to the prevalence or incidence of disease. Although statistics pertinent to the prevalence of hikikomori in Japan are available (Koyama, Kawakami et al., 2010), the DALYs of hikikomori have not been calculated and included as part of the disease burden. It is suspected that since hikikomori is found to be comorbid with other psychiatric disorders, the sequelae and DALYs of hikikomori might well be accounted for in the calculations of other psychiatric disorders traditionally used for the DALY estimation.

We acknowledge that calculation of the DALYs of hikikomori, measured by the Years of Life Lost (YLL) and the Years Lived with Disability (YLD), can be complicated. Although YLL usually refers to time lost due to prema- ture death, withdrawal at home for a long time, without doing anything, may be equivalent to time lost due to premature death. For instance, youths can develop severe withdrawn behavior, leading to suspension of the desire and will to interact with the environment and people (Li et al., 2018). YLL can, therefore, be calculated for the time lost due to hikikomori. While measuring YLD, the sequelae of hikikomori remain uncertain. Although cal- culating the DALYs of hikikomori is not feasible at this stage, it is suggested that due to the increase in “invisible” risks (Carli et al., 2014) and more internalizing problems (Bor et al., 2014) among youths in the twenty‐first cen- tury, the disease burden in many high‐income countries may be underestimated. If researchers can convince their respective governments that hikikomori can result in YLL and YLD at a very significant economic and social cost to the nations at large, they may be more inclined to view hikikomori as a significant and “genuine” youth issue. With the administrative and financial support of the governments, more rigorous panel studies can then be con- ducted in order to track epidemiological development of the phenomenon.

*Innovative ideas for engagement and intervention are needed.* One of the most difficult aspects of assisting socially withdrawn youth is that they cannot be easily identified and engaged using traditional intervention approaches. Since many withdrawn young people are unlikely to seek help for themselves, it is rational to assume that only a small number of these young people would leave their rooms and travel to the nearby health and social service

centers for help. Hence, a more proactive approach is needed to reach out to withdrawn young people. One key component of the program in South Korea (Lee et al., 2013) and our program in Hong Kong (Wong et al., 2017) is the adoption of home visitation as a service‐delivery model. The home visitation component can not only ensure that the withdrawn young people receive the services, even at times when they are most reluctant to leave their homes, but it can also allow parents to be involved in the intervention process. There are also programs that make good use of the advancement of information communication technology in order to engage and provide services to the withdrawn young people “off‐the‐ground” (Chan & Lo, 2014a; Chan & Lo, 2014b). Online counseling services through text messages sent via WhatsApp, microblogs such as Twitter or Weibo, and social networking sites such as Facebook can be considered as secure, anonymous, and nonthreatening channels through which socially withdrawn youths can reestablish their trust in others before face‐to‐face interventions are implemented. Also, high‐quality psychoeducational websites and internet‐based interventions can be used to enhance their social and problem‐solving skills. It is hoped that more innovative engagement methods can be developed to reach out to this “invisible” group of young people.

*Interventions for family and caregivers are limited.* While appropriate interventions can help vulnerable socially withdrawn youths in societies, the effects of social determinants on adolescent health should not be underestimated. Indeed, since family and school play a significant role in the development of prolonged social withdrawal, parents and teachers need to be involved in the construction of any preventative programs. Unfortunately, few studies have discussed or suggested any directions for preventative work, especially at the school level.

Additional attention should be directed toward the needs of families and caregivers of hikikomori. Providing professional support to ease the caregiver burden for primary caregivers of youth with prolonged socially with- drawn behavior is important, because: (1) professional help provided to caregivers leads to the indirect support of their withdrawn youth; (2) the supported caregivers are more likely to collaborate with professionals to encourage the young people to engage with the professionals and agree to be helped; and (3) family support prevents the caregivers from being socially isolated, psychologically distressed, and being excessively involved in the problems of their withdrawn children, all factors, which, if not addressed, may exacerbate the negative outcomes of the hikikomori. To offer optimal support, it is therefore essential to understand how caregivers perceive the phenom- enon of hikikomori and how they influence the development of prolonged social withdrawal behavior.

To date, all of the investigative work in relation to caregivers of withdrawn young people has been con- ducted in Japan. Suwa and colleagues (2004) conducted a case‐controlled, cross‐sectional study comparing families with and without socially withdrawn children. They found that there are four unique characteristics of families with withdrawn children: “(i) there are definite rules within the family; (ii) the families share values and an unfounded pride; (iii) there is a lack of emotional exchange in the family, and it is difficult for members to empathise with each other’s negative feelings and (iv) although concerned about each other, there is little verbal exchange” (p. 592). From these family characteristics, the onset mechanism for withdrawal is normally triggered by insignificant individual and familial matters, such as minor setbacks in the developmental issues of youth. With respect to interventions for caregivers, Sakai et al. (2005) developed the Community Reinforcement and Family Training (CRAFT) program for use in behavioral psychoeducational groups consisting of parents with withdrawn adult children. That said, there is an urgent need to develop more evidence‐based preventative and intervention programs that can both educate the parents with respect to the prevention of social with- drawal behavior in the first instance, especially in children at younger ages, and, then, if there are signs of the malaise manifesting itself in the child, to implement planned intervention measures.

##### Conclusion

The phenomenon of hikikomori has become a cause of increasing concern in Japan. This is because the “first generation” of socially withdrawn youths who seclude themselves in their parents’ homes is now approaching middle age. As their parents retire and pass away, Japan may face serious economic and social consequences,

being forced into the position of having to integrate a large population of disengaged and unskilled individuals into society. In fact, the Cabinet Office announced that the estimated number of hikikomori aged between 40 and 65 years is already 610,000 in Japan, a number that is even larger than the younger group, aged between 15 and 39 years (541,000) (Kato et al., 2019). The potential costs of societal and health services intro- duced to help those individuals with their reintegration into society may be substantial. If this phenomenon remains unrecognized and understudied in non‐Japanese cultures, at its early stage of emergence, other coun- tries, too, may find that there is a dearth of skills and resources with which to reclaim the lives of those individuals who choose to live in self‐imposed seclusion.

# Solitary Confinement Is Not “Solitude”: The Worst Case Scenario of Being “Alone” in Prison

The preceding chapters have carefully reviewed extensive research that documents the wide range of effects that “being alone” can bring about – from the potentially very desirable and highly beneficial effects of true “solitude” to the harmful, damaging effects of extreme and involuntary social isolation (that often entails social exclusion and loneliness). As Coplan, Bowker, and Nelson’s opening chapter notes, solitude is a multifaceted construct. It is now abundantly clear, at least to someone like me, who has studied solitary confinement for the last several decades, that when the experience of being distanced from others is not accomplished as an exercise of personal preference, done with purposeful intent and sufficient control, as it almost never is in prison, its effects can be radically different from the positive experience of solitude per se. In fact, numerous scientific studies have established a conceptual and empirical framework for understanding how and why forced social isolation is so harmful to our well‐being, and why it is such a pernicious practice in jails and prisons.

In Matthew Lieberman’s memorable phrase, we now know that human beings are “wired to connect” (Lieberman, 2013), and the deprivation of the fundamental need for social connectedness can lead to dreadful outcomes. The need for social connectedness can be thwarted when persons are socially isolated, when they are socially excluded, and when they feel lonely. These key concepts are different but interrelated. Loneliness is the negative *subjective* feeling of being isolated or disconnected from others, whereas social isolation is the *objec- tive* condition of that disconnection, and social exclusion reflects the fact that a person’s social isolation is based on the actions of others (e.g., Newall & Menec, 2019; Smith & Victor, 2109). Although they can be conceptually distinguished, of course, they often co‐occur. Together, their widespread prevalence is now recognized as pos- ing an international public health crisis. Indeed, as just one index of the magnitude of the problem, the Prime Minister of Great Britain, Theresa May, in 2018, appointed a “minister of loneliness” to address its conse- quences in her county (Yeginsu, 2018).

Decades ago, when I first began to study the psychological effects of imprisonment, the full extent of the hazards of enforced isolation were not as well understood as they are now. Scientists had not yet clearly identi- fied and documented the profound importance of social connectedness and the pernicious effects that occur when people are denied it. In fact, the major concern for me and for other experts who were evaluating the nation’s prison system in the late 1970s and early 1980s was, in a sense, the “opposite” of isolation – overcrowd- ing. The United States had entered a period that came to be known as the “era of mass incarceration” (e.g., Gottschalk, 2006; Hinton, 2016), and the nation’s jails and prisons had begun to fill to capacity and well beyond. The more that I witnessed extraordinary levels of overcrowding that plagued correctional facilities and studied the negative psychological effects they had on prisoners, the more I wondered whether solitary confinement, at the other extreme on the spectrum of social contact, might serve as a counteractive, a place where prisoners could be housed to protect them from the most harmful consequences of being crowded together in such unsafe and inhospitable environments (Haney, 2006). Perhaps solitary confinement could provide prisoners

with a kind of respite, indeed, a form of solitude of the sort that a number of previous chapters have identified as beneficial to mental health.

However, as I began to focus more directly on the psychological consequences of being housed in solitary con- finement, I was quickly disabused of these notions. There was little or no evidence I could find of salutary effects, even for persons who had at first requested or seemed to welcome their placement there. Instead, I learned that solitary confinement was extremely problematic, even dangerous (e.g., Haney, 2003), and that its harmful effects had led to the once widespread practice being largely abandoned in the nineteenth century. As I have noted else- where, “[t]here is no other place on earth where persons are so completely and involuntarily isolated from one another” (Haney, 2020, p. 132), and we now know the range of very serious negative consequences this kind of isolation incurs. In this chapter, I very briefly review some of the extensive research that has been conducted on the adverse consequences of social deprivation broadly, in places outside of jails and prisons, and then discuss at more length how and why solitary confinement represents an extreme – indeed, “toxic” – form of isolation, one that has a range of painful, harmful, and potentially permanent (even fatal) psychological and physical effects.

##### The Adverse Effects of Social Isolation, Social Exclusion, and Loneliness

Current knowledge on the effects of social isolation, social exclusion, and loneliness is based on an extensive number of scientific studies. Many of them were conducted over the last three decades and consistently show that meaningful social contact is a fundamental human need whose deprivation has a range of poten- tially very serious psychological and even physical effects. In fact, Naomi Eisenberger, Matthew Lieberman, and others have established the neurological basis for “social pain” – the feelings of hurt and distress that come from negative social experiences such as social deprivation, exclusion, rejection, or loss (e.g., Eisenberger, 2012, 2015; Eisenberger & Lieberman, 2004). They and their colleagues have found that the neurological underpinnings of social and physical pain are related; both kinds of feelings share some of the same neural circuitry and computational mechanisms (i.e., they are processed in some of the same ways). Moreover, they have found that, unlike the experience of physical pain, which is largely transitory, social pain is more susceptible to being “relived.”

Some of the most dramatic demonstrations of the harmful effects of social deprivation have been found in animal research, where researchers are able to employ more intrusive scientific procedures and controls than with humans. These studies show that social isolation actually alters the brain’s neurochemistry, structure, and function. For example, social isolation functions as a chronic stressor that has the capacity to change the brain chemistry of animals in ways that negatively affect the cellular mechanisms of aging (e.g., Stevenson et al., 2019), precipitate depression‐like behavior in mammals (e.g., Gong et al., 2018), and suppress the animal immune response to illness (e.g., Capitanio et al., 2015). Social isolation also leads to anxiety‐like behavior in animals, impairs their working memory, and disrupts their brain activity (e.g., Zorzo et al., 2019). It also modifies their neuroendocrinal responses in ways that exacerbate the effects of stress (e.g., Frietas et al., 2019), which suggests that isolation is not only stressful in its own right, but compromises an organism’s ability to tolerate and man- age stress more generally (e.g., Locci & Pinna, 2019).

There is also extensive research conducted with human participants that has reached many of the same con- clusions. For example, social isolation and loneliness in society at large are significant risk factors for a wide range of mental health problems (e.g., Wang, et al., 2017). Specifically, social isolation increases the prevalence of depression and anxiety among adolescents and adults (e.g., Cho, et al., 2019; Richardson et al., 2019), and is related as well to psychosis (e.g., Chau, et al., 2019), paranoia (e.g., Butter, et al., 2017), and suicidal behavior (e.g., Calati, et al, 2019). Among those persons who already have been diagnosed or identified as suffering from psychiatric disorders in free society, isolation has been implicated in the persistence of delusional or psychotic beliefs (e.g., Garety, et al., 2001), a lack of insight into one’s psychiatric symptoms (e.g., White, et al., 2000), and a higher rate of psychiatric rehospitalization (Mgutshini, 2010).

Social isolation can also lead to reduced cognitive functioning (e.g., de Sousa et al., 2018; Shankar et al., 2013). For example, a study by Elvira Lara and her colleagues found that loneliness and social isolation lead to decreased intellectual functioning on a variety of cognitive tests over time, even after controlling for depression, among

older participants. To prevent such a decline, the study recommended “the enhancement of social participation and the maintenance of emotionally supportive relationships” (Lara, et al., 2019, p. 8).

Finally, there are a number of well‐documented harmful physical outcomes associated with social isolation and loneliness in humans, including adverse effects on neurological and endocrinological processes. As one group of researchers summarized, “[t]hese findings indicate that loneliness may compromise the structural and functional integrity of multiple brain regions” (Mwilambwe‐Tshilobo, et al., 2019, p. 424). For example, Nathan Spreng and his colleagues have shown that loneliness is inversely related to a sense of “life meaning” (i.e., a subjective sense of purpose), and that both are in turn related to measures of neural connectivity (Mwilambwe‐Tshilobo, et al., 2019). In addition, social isolation adversely impacts the functioning of the human immune system (Eisenberger, et al., 2017; Uchino et al, 2018), undermines health outcomes in general (e.g., Beller & Wagner, 2018; Fiorillo & Sabatini, 2011), and is associated with higher rates of mortality. That is, the experience of social isolation literally lowers the age at which people die (e.g., Friedler et al., 2015; Pantell et al., 2013). In fact, researchers have concluded that the health risk of social isolation on mortality rates is comparable to that caused by cigarette smoking (Holt‐Lunstad et al., 2015), a conclusion that a National Academy of Sciences Committee also reached, finding that the negative consequences of social isolation “may be comparable to or greater than other well‐established risk factors such as smoking, obesity and physical inactivity” (National Academies of Sciences, Engineering, and Medicine, 2020, p. xii).

Paralleling the research that has been conducted on the adverse psychological and physical effects of social isolation, there is a closely related and well‐developed body of literature on what has been termed “social exclu- sion” – what happens when people are involuntarily and purposely separated from others, as they are in prison solitary confinement units. These studies, too, show that this kind of social separation produces a host of serious negative consequences. For example, Mark Leary and his colleagues have shown that increasing degrees of social exclusion successively lower self‐esteem, which in turn relates to greater levels of depression, anxiety, and a host of other psychological problems (Leary, et al., 1995, 1998). In fact, they have suggested that self‐esteem itself may be largely a reflection of a person’s level or state of social connectedness. Researchers also have documented the fact that excluding persons from contact with others is not only “painful in itself,” but also “undermines people’s sense of belonging, control, self‐esteem, and meaningfulness, reduces pro‐social behavior, and impairs self‐regu- lation” (Bastian & Haslam, 2010, p. 107). Indeed, the subjective experience of social exclusion can result in what have been called “cognitive deconstructive states,” which include emotional numbing, reduced empathy, cogni- tive inflexibility, lethargy, and an absence of meaningful thought (Twenge et al., 2003).

Social exclusion also has been shown to heighten people’s feelings of physical vulnerability and increase the expectation that they will experience physical harm in the future (e.g., Dean et al., 2016). It may also precipitate aggressive behavior –“action‐oriented coping” – in response (Reiter‐Scheidl et al., 2018). In fact, the editor of the *Oxford Handbook of Social Exclusion* concluded the volume by summarizing the “serious threat” that social exclusion represents to psychological health and well‐being, including “increased salivary cortisol levels [. . .] and blood flow to brain regions associated with physical pain,” “sweeping changes” in attention, memory, thinking, and self‐regulation, as well as changes in aggression and prosocial behavior. As he put it, “This dizzy- ing array of responses to social exclusion supports the premise that it strikes at the core of well‐being” (DeWall, 2013, p. 302).

In sum, there is a carefully developed body of scientific knowledge that catalogues the broad range of serious adverse effects that are brought about by social isolation, exclusion, and loneliness. These effects have been found in a broad range of studies documenting adverse and even life‐threatening consequences for animals as well as humans.

##### Solitary Confinement Is a Form of “Toxic” Social Isolation

It is important not only to situate the harmfulness of solitary confinement in correctional settings within this larger scientific framework but also to recognize that the adverse effects of isolation in prison – “solitary confinement” – are likely to be *far* greater. The nature of *prison* isolation is likely to make the experience significantly *more* stressful, hurtful, harmful, and dangerous than in the larger society, where we already know that the deleterious effects are substantial.

Of course, there are arguably “better” and “worse” solitary confinement units, and prisoners are likely to suffer more and deteriorate more rapidly in ones that are the harshest and most deprived. Yet the essence of solitary confinement in jail and prison is still the deprivation of meaningful human social contact. Even though lonely, isolated persons in the free world are likely to have far more privacy, access to daylight, freedom of movement, and so on than any prisoner in solitary confinement, they are still at psychological and physical risk by virtue of their social isolation. As the larger literature on social isolation and loneliness underscores, it is isolation itself that is dangerous.

Yet the onerous aspects of prison and jail isolation only intensify the painfulness of this powerful stressor and worsen its impact. For one, solitary confinement is coercively enforced and the degree of isolation imposed is nearly complete. Except in special cases, prisoners rarely go willingly into solitary confinement. Indeed, in many instances they must be forcibly removed from their cells (“cell extracted”) and taken to soli- tary confinement by special tactical units of correctional officers who are suited up in body armor, armed with special weapons (e.g., batons, pepper spray, tasers), and operate in tandem to physically control, domi- nate, and subdue prisoners (e.g., Haney, 1993, p. 21, n. 6). The elaborate procedures correctional officers are routinely instructed to employ ensure that the encounters themselves are inherently confrontational; it is not uncommon for them to turn physically violent and, in that sense, traumatic for everyone involved (e.g., DeVeaux, 2013; Goode, 2014a, 2014b).

Moreover, solitary confinement is virtually always accompanied by a host of additional deprivations that extend beyond the dangerous lack of meaningful social contact. Those additional deprivations commonly include the absence of positive or pleasurable environmental stimulation in settings that prisoners are unable to control or significantly modify. The physical environment in most solitary confinement units is character- ized by its closed‐in nature (in the cells, of course, but also in the cellblocks themselves) and unchanging drab- ness. As I have described them previously: “Inside their cells, units, and ‘yards,’” prisoners in solitary confinement units “are surrounded by nothing but concrete, steel, cinderblock, and metal fencing – often gray or faded pastel, drab and sometimes peeling paint, dingy, worn floors. There is no time when they escape from these barren ‘industrial’ environments” (Haney, 2008, p. 968).

Indeed, many solitary confinement units are explicitly, often inventively, designed to limit or eliminate the prisoners’ contact with nature – restricting or preventing exposure to natural light, grass, and even glimpses of the horizon or sky. There are even some units where prisoners cannot tell whether it is day or night. The only variations in sensory stimulation are typically auditory, but these too often come in the form of aversive, loud noises that, in addition to the banging of heavy metal doors, include pounding on walls and shouting or scream- ing at all hours of the day and night from other prisoners who may be mentally ill and/or suffering the adverse effects of isolation. Thus, prisoners in solitary confinement are exposed to an especially problematic combina- tion of too little *and* too much sensory stimulation. On the one hand, they experience a reduced and monoto- nous kind of sensory input – the limited, repetitive perceptual and experiential sameness in the physical environment around them. Simultaneously, however, they are often subjected to a great deal of aversive, nox- ious stimulation – loud noise, bright lights, foul smells – under circumstances that they typically cannot control. In these cases, “reduced environmental stimulation” refers to the lack of *positive* stimuli, despite being bom- barded with aversive stimuli that are beyond their control.

Moreover, prisoners who are placed in solitary confinement virtually always face severe restrictions on the amount and kind of personal property they can possess. In many such units, prisoners have limited access to electronic appliances (such as radios and televisions), or may be prohibited in having any, are restricted in the nature and amount of commissary products they may purchase from the prison store, and are permitted to possess only limited amounts of reading material in their cells. Prisoners in solitary confinement are typically denied access to meaningful activities or programming, both inside and outside their cells. Other than the few prisoners who are selected as “tier tenders” – working to clean units and perhaps deliver mail to other prison- ers – they are prohibited from having jobs, receiving vocational training, taking in‐person educational classes of any kind, or participating in hobby craft. Most solitary confinement units impose strict limits on access to telephones so that, in addition to limited numbers of noncontact visits, they are severely cut off from the outside world.

Unlike social isolation in the free world, solitary confinement in jails and prisons is also “pejoratively imposed,” in the sense that significant stigma and gratuitous humiliation are commonly associated with it. From the perspective of the staff, at least, and in some instances the prisoners as well, prisoners housed in solitary confinement are in an even more degraded status than others. Thus, the dehumanizing and dero- gating aspects of prison life (e.g., Binnall, 2008) are greatly intensified in solitary confinement units. Prisoners who are placed in solitary confinement are sometimes referred to as the “worst of the worst,” but they are virtually always treated as the “lowest of the low.” I have suggested elsewhere that prisoners in solitary confinement are enveloped in a “culture of harm” that includes not only the isolating architec- ture and procedures that characterize the environment, but also the “atmosphere of thinly veiled hostility and disdain [that] prevails” (Haney, 2008, p. 960). Interactions with staff are “fraught with resentment and recrimination” (p. 960) and an “ecology of cruelty” subjects prisoners in solitary confinement to the imple- ments of forceful subjugation, including “handcuffs, belly chains, leg irons, spit shields, strip cells, four‐ point restraints, canisters of pepper spray, batons, and rifles,” often wielded by flak‐jacketed, helmeted officers (p. 970).

The natural human reactions and adaptations that prisoners have to the multiple dimensions and harsh con- tingencies they face inside jail and prison solitary confinement units can have especially severe consequences that lead to even more painful and extended stays in solitary confinement. For example, several studies found that the experience of loneliness leads naturally to hypervigilance about perceived social threats, which, in turn, can produce overreactions to potentially threatening external stimuli (e.g., Bangee et al., 2014; Cacioppo et al., 2016). Prisoners in solitary confinement are susceptible to a form of “institutional paranoia” in which they come to distrust literally everyone with whom they interact. This includes not only prison personnel, but also other prisoners whom they begin to suspect of harboring ill will or conspiring against them. Although entirely understandable under the circumstances in which it occurs – prisoners in solitary confinement have often said to me, only partly in jest, that “it isn’t paranoia if people really *are* out to get you” – this adaptation makes the social pain of solitary confinement more difficult for them to alleviate. Similarly, researchers have found that loneliness reduces the amount of pleasure persons derive from rewarding social stimuli (e.g., Cacioppo & Hawkley, 2009). This means that even the extraordinarily limited positive social stimulation that might occur in solitary confinement may have only limited beneficial or ameliorating effects, because the effects of extreme isolation has numbed their capacity to enjoy it.

Finally, there is one more form of deprivation that prisoners in solitary confinement endure – the depriva- tion of caring human touch. Many prisoners in solitary confinement units are forced to go for weeks, months, or even years without touching another person with affection because virtually all prison systems prohibit contact visits for their isolated prisoners. As with social isolation, the importance of caring physical touch also has been studied extensively in contexts outside prison (e.g., Field, 2010). Psychologists have long known that “[t]ouch is central to human social life. It is the most developed sensory modality at birth, and it contributes to cognitive, brain, and socioemotional development throughout infancy and childhood” (Hertenstein et al., 2006, p. 528). Research now indicates that “touch is a primary platform for the develop- ment of secure attachments and cooperative relationships” (Goetz et al., 2010, p. 360). The need for caring human touch is so fundamental that early deprivation is an established risk factor for neurodevelopmental disorders, depression, suicidality, and other self‐destructive behavior (e.g., Cascio, 2010; Field, 2005). Later deprivation is associated with violent behavior in adolescents (e.g., Field, 2002). The uniquely prosocial emotion of compassion “is universally signaled through touch,” so that persons who live in a world without touch are denied the experience of receiving or expressing compassion in this way (e.g., Stellar & Keltner, 2014). Prisoners in solitary confinement are subject to this form of deprivation, in addition to all the others I have outlined above.

In sum, it is hard to imagine a place *less* likely to afford what most of us think of as a peaceful and pleasant form of “solitude.” Solitary confinement is in many ways the very antithesis of an environment where mind- fulness, equanimity, or tranquility is likely to be attained. It is reasonable to expect that the problematic, pain- ful, and damaging effects of social isolation will be greater for prisoners in solitary confinement than elsewhere, and the research reviewed in the next section confirms this expectation.

##### The Specific Psychological Effects of Solitary Confinement

The original “penitentiary” model of prison confinement that was prevalent until near the end of the nine- teenth century depended heavily on solitary confinement. Its widespread use in the United States and many other countries was premised on the mistaken belief that prisoners would benefit from the solitude and oppor- tunity for self‐reflection and penance that it supposedly afforded, as well as the complete separation from con- taminating outside influences, including from each other (Rothman 1971). For example, in 1833, the governor of New Jersey urged the state legislature to fund the construction of a new penitentiary in his state, one devoted to an extreme form of total solitary confinement that, at the time, was used only in the neighboring state of Pennsylvania (and came to be known as the “Pennsylvania system”). In complete isolation, he said, “the mind of man is necessarily cast upon itself,” forcing “the unwelcome task of self examination” until the prisoner is made “humble and teachable,” finally “prepared to receive with gladness” whatever moral and reli- gious instruction the prison was able to provide. Thus, “the most powerful agent in the work of individual reformation is solitude” (quoted in Frankel, 1937, p. 98). However, by the end of the nineteenth century these beliefs had been definitively disproven and solitary confinement was, in the words of U.S. Supreme Court Justice Miller, “found to be too severe” (*In re Medley*, 1890, p. 168). It was regarded as an “infamous punishment” that “always implies disgrace” (p. 169), and was largely abandoned.

The practice returned with a vengeance in American corrections in the 1980s. At the height of its renewed popularity there were as many as 100,000 persons estimated to be in solitary confinement in the nation’s jails and prisons (Obama, 2016). Approximately 20% of persons incarcerated in the United States spent some time in isolation in any given year (Beck, 2015). The rise in the use of solitary confinement occurred despite the existence of a substantial body of literature documenting the significant risk of serious psychological harm occur when persons are placed there. These broad patterns have been consistently identified in per- sonal accounts written by persons confined in isolation, in descriptive studies authored by mental health professionals and others who worked in many such places, and in a large body of systematic, scientific research conducted on the effects of solitary confinement. The studies have been carried out over a period that now spans many decades, conducted in locations across several continents by researchers with different kinds of professional expertise, ranging from psychiatrists to sociologists to historians and architects. We now know that the absence of meaningful human contact and social interaction, the enforced idleness and inactivity, reduced environmental stimulation, and the oppressive security and surveillance procedures employed in solitary confinement units combine to threaten the health and well‐being of prisoners who are subjected to them.

In one illustrative study conducted in the 1970s by psychologist Hans Toch identified what he called “isola- tion panic,” a set of adverse reactions to solitary confinement that included rage, panic, loss of control and breakdowns, psychological regression, and a buildup of physiological and psychic tension that led to incidents of self‐mutilation (Toch, 1975). Toch noted that although isolation panic could occur under other conditions of confinement, it was “most sharply prevalent in segregation” (Toch, 1975, p. 54). Moreover, it marked an impor- tant dichotomy for prisoners: the “distinction between imprisonment, which is tolerable, and isolation, which is not” (Toch, 1975, p. 54).

More recent studies also identified a wide range of adverse psychological reactions that frequently occur in solitary confinement. Among the specific symptoms are: stress‐related reactions (such as decreased appetite, trembling hands, sweating palms, heart palpitations, and a sense of impending emotional breakdown); sleep disturbances (including nightmares and sleeplessness); heightened levels of anxiety and panic; irritability, aggression, and rage; paranoia, ruminations, and violent fantasies; cognitive dysfunction, hypersensitivity to stimuli, and hallucinations; loss of emotional control, mood swings, lethargy, flattened affect, and depression; increased suicidality and instances of self‐harm; and, finally, paradoxical tendencies to further social with- drawal. These and other adverse reactions have been reviewed and summarized in a host of publications (e.g., see: Arrigo & Bullock, 2008; Haney, 2003, 2018; Haney & Lynch, 1997; Smith, 2006).

In addition, there is a large international literature on the adverse psychological effects of solitary confinement. It includes Barte’s (1989) study of the practice in French prisons, which he observed had “psychopathogenic”

effects that prisoners placed there for extended periods of time. The prisoners could become schizophrenic instead of receptive to social rehabilitation, leading Barte to conclude that the practice was unjustifiable, counterproduc- tive, and “a denial of the bonds that unite humankind” (p. 52). Similarly, Ida Koch’s (1986) study of “acute isolation syndrome” among detainees in Denmark that occurred after only a few days in isolation found that prisoners suf- fered “problems of concentration, restlessness, failure of memory, sleeping problems and impaired sense of time and ability to follow the rhythm of day and night.” If the isolated confinement persisted for “a few weeks” or more, Koch reported that it could lead to “chronic isolation syndrome.” The syndrome included intensified difficulties with memory and concentration, “inexplicable fatigue,” a “distinct emotional lability,” “fits of rage,” hallucinations, and the “extremely common” belief among isolated prisoners that “they have gone or are going mad” (p. 124–125). Relatedly, Rene Volkhart and his colleagues studied penal isolation in Switzerland, and reported that when prisoners in normal conditions of confinement were compared to those in solitary confinement, the latter were found to display considerably more psychopathological symptoms. The symptoms included heightened feelings of anxi- ety, emotional hypersensitivity, ideas of persecution, and thought disorders (Volkart, Dittrich et al., 1983). (See also Bauer et al., 1993; Volkart, 1983; Volkart, Rothenfluh et al., 1983; and Waligora, 1974).

In addition to the specific signs and symptoms of psychological distress and isolation‐related cited above, placement in solitary confinement leads to other negative outcomes, some of which are fatal. For example, Patterson and Hughes (2008) attributed higher suicide rates in solitary confinement units to the heightened levels of “environmental stress” that are generated by the “isolation, punitive sanctions, [and] severely restricted living conditions” that exist there. They noted that “the conditions of deprivation in locked units and higher‐ security housing were a common stressor shared by many of the prisoners who committed suicide” (p. 678). Lanes (2009, 2011) found that prisoners with extensive histories of self‐injury were especially likely to be placed in solitary confinement, despite research showing that self‐injurious behavior persist at a disproportionately high level in these units. In fact, a team of researchers in New York found that “[i]nmates punished by solitary confinement were approximately 6.9 times as likely to commit acts of self‐harm after we controlled for the length of jail stay, SMI [whether the inmate was seriously mentally ill], age, and race/ethnicity” (Kaba et al., 2014, p. 455).

There is an additional issue that is important to clarify in conjunction with these findings. Although they are rapidly dwindling in number, defenders of solitary confinement sometimes portray the experience as, at worst, a minimally painful experience, which they support with the suggestion that many prisoners “prefer” solitary confinement to mainline prison housing. It is true that some prisoners do request placement in a form of soli- tary‐type confinement, in so‐called “protective custody,” “safekeeping,” or “sensitive needs” housing units. However, I have learned over the years that the supposed “preference” for solitary confinement must be under- stood in the context in which it is expressed. This context virtually always entails a terrible Hobson’s choice with which most such prisoners are confronted, namely, with whether or not to attempt to preserve their physi- cal well‐being at the expense of their mental health. Because physical threats in prison are often dire, tangible, and imminent, it is not surprising that some prisoners assume (or gamble) that they may be able to psychologi- cally withstand the rigors of solitary confinement while protecting themselves from violent victimization. Some miscalculate and suffer significant psychological pain (e.g., Brodsky & Scogin, 1988). Indeed, as philoso- pher Kimberley Brownlee has argued in this context, that the notion of “voluntary self‐isolation” should be regarded with great skepticism because, as she noted, “voluntariness always depends on the range and value of the choices available” (Brownlee, 2013, p. 206). Moreover, “[i]f a person’s principal forms of social interaction are hostile, degrading, or cruel, then she may voluntarily withdrawal from that social environment but, given the context, her decision will not differ much from a non‐voluntary withdrawal” (p. 206).

##### Extreme and Prolonged Effects of Solitary Confinement

One measure of the pain, suffering, and psychic damage that solitary confinement incurs is reflected by the fact that it is commonly used in so‐called brainwashing and certain forms of torture. In fact, many of the negative effects of solitary confinement are analogous to the acute reactions suffered by torture and trauma victims, including post‐traumatic stress disorder (PTSD) and the kind of psychiatric sequelae that plague victims of

what are called deprivation and constraint torture techniques (e.g., Lippman, 1994; Somnier & Genef ke, 1986; Whittaker, 1988). For example, Foster (1987) listed solitary confinement among the most common “psycho- logical procedures” used to torture South African detainees, and concluded that “[g]iven the full context of dependency, helplessness and social isolation common to conditions of South African security law detention, there can be little doubt that solitary confinement under these circumstances should in itself be regarded as a form of torture” (p. 136).

In addition, solitary confinement can produce broader and longer‐lasting effects, in the form of “social pathologies” that are brought about by forcing prisoners to adapt to an environment that is devoid of normal, meaningful social contact (Haney, 2003). That is, requiring prisoners to exist and function in the socially patho- logical environment of solitary confinement, where their day‐to‐day life does not permit meaningful interac- tion and closeness with others, forces them to adapt in socially pathological ways. Over time, many prisoners gradually change their patterns of thinking, acting, and feeling to cope with the profoundly asocial world in which they are forced to live, as they attempt to adjust to the absence of social support and the routine feedback that comes from normal, meaningful social contact.

Although these adaptations are functional – even necessary – under the isolated conditions in which prison- ers live, eventual “adjustment” to the absence of others does not mean that social deprivation ceases to be painful. Prisoners liken the absence of meaningful contact and the loss of closeness with others to a dull ache or pain that never goes away. Many of them remain acutely aware of the relationships that have ended and the feelings of closeness to others that can never be rekindled.

Indeed, some prisoners cope with the painful, asocial nature of their isolated existence by paradoxically cre- ating even more distance between themselves and others. The absence of meaningful social contact becomes so painful that they convince themselves that they do not need it – that people are a “nuisance,” and the less contact they have the better. As a result, these prisoners socially withdraw further from the world around them, receding even more deeply into themselves than the sheer physical isolation of solitary confinement and its attendant procedures require. Some prisoners move from initially being starved for social contact to eventually being disoriented and even frightened by it. As they become increasingly unfamiliar and uncomfortable with social interaction, they are further alienated from others and made anxious in their presence (e.g., Cormie & Williams, 1966: Haney, 2003; Miller & Young, 1997).

In later stages of adapting to solitary confinement, these otherwise necessary social pathologies can be so deeply internalized that they persist long after the prisoner’s time in isolation has ended. Thus, the adap- tations move from being consciously employed survival strategies or reactions precipitated by their imme- diate conditions of confinement to more deeply ingrained ways of being. Prisoners may develop extreme habits, tendencies, perspectives, and beliefs that are difficult or impossible for them to relinquish once they are released. Although their adaptations may have been functional under condition of isolation (or appeared to be so), they are highly dysfunctional in the social world that formerly incarcerated persons are expected to re‐enter. In extreme cases, these ways of being may become so deeply internalized that they are disa- bling, and interfering with the capacity to live a remotely normal or fulfilling social life. Thus, the living in solitary confinement can make a person’s subsequent adjustment – either to the general prison population or to free society – painful and challenging, especially if they are not afforded meaningful assistance to make the transition.

For example, a group of Stanford researchers found that behavioral patterns and psychological reactions developed in the course of adapting to solitary confinement were persistent and problematic when formerly long‐term isolated prisoners attempted to transition back to mainline prison housing (Human Rights in Trauma Mental Health Lab, 2017). In addition, there is evidence that persons once housed in solitary confine- ment encounter more serious obstacles to successful reintegration back into free society, and that there are few if any specific programs available that acknowledge their solitary confinement‐related traumas and assist them in overcoming the psychological aftereffects (e.g., Pforte, 2020). They suffer post‐prison adjustment problems at higher rates than the already high rates experienced by formerly incarcerated persons in general, including being more likely to manifest symptoms of post‐traumatic stress disorder or “PTSD” (Hagan et al., 2018). In addition, Lauren Brinkley‐Rubinstein and her colleagues reported that formerly incarcerated

persons who had spent time in solitary confinement were significantly more likely than other prison releasees to die during their first year of community reentry, especially from suicide, homicide, and opioid abuse (Brinkley‐Rubinstein et al., 2019).

##### Reducing and Eliminating the Use of Solitary Confinement

I noted earlier that widespread social isolation, social exclusion, and loneliness are now regarded as part of an international public health crisis, and that efforts were underway to address it. Not surprisingly, perhaps, given the “toxic” nature of the social isolation that is imposed in solitary confinement, a consensus has emerged among broad and diverse constituencies that now this practice as representing a significant human rights, men- tal health, and legal problem. Over the last decade and a half, a number of prominent scholarly, scientific, and medical organizations and expert panels have issued statements reflecting this consensus about the harmful- ness of solitary confinement and the urgent need to restrict or eliminate its use. For example, in 2006, a land- mark report was published that was based in large part on a series of fact‐finding hearings conducted across the United States by the bipartisan Commission on Safety and Abuse in America’s Prisons (Gibbons & Katzenbach, 2006). In the course of the hearings, diverse groups of nationally recognized experts, stakeholders, and policymakers testified about a wide range of prison‐related issues. Among other things, the Commission concluded that solitary and supermax‐type units were “expensive and soul destroying” (Gibbons & Katzenbach, 2006, p. 59).

The next year, in 2007, an international group of prominent mental health and correctional experts meeting on psychological trauma in Istanbul, Turkey issued a joint statement on “the use and effects of solitary confine- ment” (International Trauma Symposium, 2008). In what has come to be known as the “Istanbul Statement,” they acknowledged that the “central harmful feature” of solitary confinement is its reduction of meaningful social contact to a level “insufficient to sustain health and well being” (p. 64). Similarly, the American Public Health Association (2013) issued a statement in which it detailed the public‐health harms posed by solitary confinement, including that “[p]risoners in long‐term solitary confinement are subject to significant mental suffering and deterioration” and “may develop anxiety, panic attacks, paranoia, cognitive impairment, social withdrawal, somatic symptoms, hypersensitivity to external stimuli, and perceptual disturbances.”

In 2014, a National Academy of Sciences committee noted that “there are sound theoretical bases for explain- ing the adverse effects of prison isolation,” that being housed on a long‐term basis in solitary confinement “can inflict emotional damage” (National Research Council, 2014, p. 186), and that “direct studies of prison isolation document a broad range of harmful psychological effects” (p. 187). Finally, the committee concluded that “[l] ong‐term segregation is not an appropriate setting for seriously mentally ill inmates” and that “[i]n all cases, it is important to ensure that those prisoners who are confined in segregation are monitored closely and effec- tively for any sign of psychological deterioration” (National Research Council, 2014, p. 201).

In an especially important development that occurred a year later, the United Nations codified many of the recommendations that had been made by other professional and expert groups in what were called “The Mandela Rules” (Commission on Crime Prevention and Criminal Justice, 2015). They significantly regulated and limited the use of solitary confinement by providing, among other things, that it only ever be used “as a last resort,” and never be imposed on persons whose mental or physical conditions would be exacerbated by the experience. It also recommended that solitary confinement lasting for more than 15 consecutive days be deemed “prolonged,” recognized as torture, and therefore prohibited.

A year later – in April 2016 – the National Commission on Correctional Health Care (‘NCCHC”), a profes- sional organization of prison health care providers, issued a Position Statement on solitary confinement. Relying on many of the scientific sources I cited earlier, the NCCHC declared the “inherent restriction in meaningful social interaction and environmental stimulation and the lack of control adversity impact the health and welfare of all who are held in solitary confinement,” that “[e]ven those without a prior history of mental illness may experience a deterioration in mental health,” such that “the very nature of prolonged social isolation is antithetical to the goals of rehabilitation and social integration” (National Commission on Correctional Health Care, 2016, p. 258). That same year, the American Psychological Association

acknowledged that solitary confinement was associated with heightened risk of self‐mutilation and suicidal- ity, a range of adverse psychological symptoms such as anxiety, depression, sleep disturbance, paranoia, and aggression, and the exacerbation of preexisting mental illness and trauma‐related symptoms (American Psychological Association, 2016).

Finally, in 2018, two important documents summarized the urgent need for, and significant progress made implementing significant restrictions on the use of solitary confinement. A collaborative effort by Judith Resnick and her colleagues at Yale Law School’s Liman Public Interest Program and the Association of State Correctional Administrators (ASCA) reported the results of a national survey of prison officials that addressed current practices with respect to solitary confinement. In a summary of their findings, they wrote:

Correctional administrations’ efforts to reduce the numbers of people in [solitary confinement] are part of a larger picture in which legislatures, courts, and other institutions are seeking to limit holding people in cells 22 hours or more for 15 days or more. These endeavors reflect the national and international consensus that [solitary confine- ment] imposes grave harms on individuals confined, on staff, and on the communities to which prisoners return.

The ASCA‐Liman group noted that once solitary confinement was seen “as a solution to a problem,” but now it is regarded by prison officials as itself a problem to be solved (Association of State Correctional Administrators & Yale Law School, Arthur Liman Public Interest Program, 2018, p. 6).

Similarly, in 2018, a group of international legal, medical, mental health, and human rights scholars and experts were convened in Santa Cruz, California, to produce a set of “guiding principles” designed to advance solitary confinement reform in the United States and internationally, timed to coincide with the ten‐year anni- versary of the Istanbul Statement. The principles established in the Consensus Statement (Haney et al., 2020) that resulted included the overarching admonitions that solitary confinement should only be used when abso- lutely necessary (i.e., in response to exigent circumstances that cannot be addressed any other way), for the shortest amount of time possible (from periods of a few hours to no more than a 15‐day maximum), and never with certain vulnerable populations (such as juveniles and the mentally ill).

##### Conclusion

Social connectedness is now recognized as a fundamental human need. Forms of forced or unwanted social isola- tion, social exclusion, and loneliness produce a wide range of damaging psychological and physical effects. However problematic these negative experiences are when they occur in free society, they are more hurtful and harmful in solitary confinement, where social isolation is more completely and forcefully imposed, and accompa- nied by a host of other deprivations that exacerbate its negative consequences. Although this form of “toxic” social isolation was commonplace in correctional institutions more than a century ago, it was abandoned because of its extremely harmful effects. Despite its discreditable history, it returned to widespread use in prison systems over the last several decades, especially in the United States, during the “era of mass incarceration.” Fortunately, there is once again widespread recognition of its profound harmfulness, and an emerging consensus among human rights groups, mental health and medical professionals, legal experts, and correctional officials that the practice must be drastically restricted if not eliminated.

### Social Withdrawal in Childhood: A Personal History of Theory and Research That Gnided a Program of Developmental Research

##### A Personal “Introduction”

This *Handbook of Solitude* evokes feelings of great pride.\* The three co‐editors, Rob Coplan, Julie Bowker, and Larry Nelson were, at one time or another, graduate students who I had the pleasure of mentoring. And the same is true for Xinyin Chen and Charissa Cheah, two additional contributors to this compendium. Each of the co‐editors (and the chapter writers noted above) is a member of a multigenerational, collaborative research “family” that has helped, for the past 45 years, to shape a field of research that did not exist when I was a young scholar – the developmental origins, concomitants, and consequences of *social withdrawal* in childhood and adolescence. The study of social withdrawal became my first attempt at theoretically derived, *programmatic*, longitudinal, developmental research.

It bears noting that, originally, what *I* meant by social withdrawal was the *consistent (across situations and over time) display of solitary behavior when encountering familiar and/or unfamiliar peers*. Simply put, when I first began to think about, and eventually study social withdrawal, it was construed as a construct that represented the literal, *behavioral* display of solitude when in the company of peers. Today, as one can read in the chapters that comprise the substance of this volume, the study of social withdrawal, and its definition, has expanded voluminously.

Three basic questions kickstarted that, which eventually became the original program of research: (1) Does the construct, social withdrawal, actually exist? That is, can one *observe* children who have a distinct tendency to display solitude in the company of *familiar* others? (2) If the construct can be reliably observed in the class- room or at school, *what are its correlates during the early, middle, and late periods of childhood*? And are these cor- relates of a substance that suggests social, social‐cognitive, and emotional impairment? (3) Can the regular, over time, continuous *display* of social withdrawal *predict* negative social and emotional outcomes in childhood and adolescence?

The primary purpose of this chapter is to provide the reader with a very personal, historical context for the contemporary study of social withdrawal. Consequently, I begin with the original rationale for examining a construct that truly did not exist in the *developmental* literature prior to the 1970s. This rationale derived from several theories that existed at the time; theories whose creators and adherents never actually used the term “social withdrawal.” Thereafter, I describe *initial* studies that provided evidence for the theoretically based

assumptions that peer interaction among familiar age mates was associated with normative, competent social‐ cognitive, and social development.

These initial sections of the chapter are followed by a detailed description of the first longitudinal, program- matic study of social withdrawal as defined above – the *Waterloo Longitudinal Project*. It was this longitudinal study that set the stage for the voluminous trajectory of social withdrawal research that followed in the 1990s and across into the next millennium.

### Remembering Yonr Ancients

In recent years, I have taken to assigning one specific reading in every graduate seminar that I teach – Robert Sears’ (1975) beautifully composed “*Your ancients revisited: A history of child development*.” As I, myself, have aged, I have reached a “critical period” in my career that has been accompanied by what seems to me to be a “genera- tionally‐based need” to remind younger scholars that knowledge of the past can be rather helpful in creating a viable future for any given field of study. To this end, I often find myself asking younger scholars who have been invited to “give a talk” in my department: “Have you ever read Robert Sears’ “*Your ancients revisited*?” Introspectively, I am fully aware that I have become the prototype of an entirely predictable, occasionally grumpy, elderly citizen of the Developmental Science community.

The madness that keeps me asking the very same question derives from observations that I have made continu- ously since the beginning of the newish millennium. On more than one occasion, I have found myself, in an audi- ence, listening to a bright, productive scholar who happens to be visiting my department as a colloquium speaker or as a job candidate. The individual may be describing an ongoing research program in which the central aims (and findings) remind me of something that I have read in the long distant past. Allow me to provide one example.

Not long ago, I listened to a colloquium speaker describe her rather elegant program of research about the different “types” of speech that lower income, poorly educated parents direct to their young children. The goals, methods, and analyses of the study were spot on. However, as I listened to the presentation, it seemed to me that I’d heard this story before. In this particular case, I was reminded of the work published by Hess and Shipman in 1965! These researchers had discovered socioeconomic status differences with respect to the rela- tions between cognitive and language functioning and the maternal use of specific linguistic codes. Indeed, the findings presented by our department visitor were precisely that which had been reported over 50 years earlier! After the speaker had completed her presentation, I asked whether she was familiar with the work of Hess and Shipman (1965); I also happened to mention the relevance of the writings of Basil Bernstein (1971) who had made distinctions between *restricted* and *elaborated* codes of speech; again, this work was entirely relevant to the presenter’s ongoing research. As it happens, our speaker was unaware of her “ancients.” But to her credit, and in good faith, she returned to her home campus and immediately sought out the references that I had provided. Not long after her visit, I received a welcome note of gratitude and apology (for being unaware of this highly relevant work). I suppose that this is how attempts to mentor *should* work.

With this example in mind (I have experienced many more!), I have reached the dire conclusion that count- less contemporary researchers (and their students) no longer avail themselves to library stacks. Instead, one can simply open a laptop to call up the university library and access *PsychInfo*. If one is interested in “social with- drawal and friendship in childhood,” one simply types in the key words and obtains, usually in chronological order, multiple citations of relevant papers. Given that in preparing a manuscript, one must keep one’s review of literature to relatively few pages, I have come to the opinion that the relevant papers that appear at the very bottom of the *PsycInfo* list (that is, manuscripts published in the previous century) remain unread, ignored, and unknown. All of which is to say, that in the sections that follow, my ancients will not be ignored.

##### Remembering Mary Northway

In keeping with the suggestion that young scholars should know their ancients, it bears noting that the devel- opmental study of social withdrawal may have originated in a program of research that was focused on the construct of sociometry. During the early 1940s, Mary Northway, a Canadian professor in both the Department

of Psychology, University of Toronto and the Institute of Child Study, published several manuscripts in the journal, *Sociometry*. The journal had been founded in the previous decade by Jacob Moreno (1934), who had introduced the study of sociometry in his classic monograph, “Who Shall Survive? A New Approach to the Problem of Human Interrelations.” Moreno had defined sociometry as “the inquiry into the evolution and organization of groups and the position of individuals within them.” (Moreno, 1951, p. 39). In one of her semi- nal manuscripts, Northway (1946) noted that: “In its procedure, sociometry is based on the ability of the indi- vidual to discriminate (or choose) among objects (people) in his environment and to select those for whom he has certain preferences” (p. 234).

Northway (1944) conducted a series of sociometric studies of children attending both summer camps and elementary schools in the province of Ontario, Canada. The goal of these studies was to determine “the person- ality patterns of children least acceptable to their age mates” (Northway, 1944, p. 10). Summer camp was chosen as a primary venue of data collection, in part, because Northway was the director of research and education for the Ontario Camping Association from 1930 into the 1940s! Schools, of course, were venues within which chil- dren spent most of their time during the non‐summer weeks, and at the time of her initial studies, schools expressed interest in discovering which children were accepted by their peers and why this was the case.

Children who participated in Northway’s sociometric research were asked simply, “Who do you prefer to spend time with?” In a nutshell, the most relevant findings, *given the theme of the present handbook*, pertained to the “personality characteristics” of preschool and elementary school age children who were *least accepted* by their peers. The first group that fell into the least accepted category were those described as “showing recessive characteristics.” This group comprised children with learning disabilities or who had low mental age scores on intelligence tests. A second group that fell into the least accepted category were those who were described as “aggressive, destructive, boisterous, and rude (Northway, 1946, p. 237).” And lastly, the third group of least accepted children were those who were “socially uninterested!”

This last group comprised children who were variously labelled as “shy,” “docile,” “quiet” and “retiring.” Northway described these children as disliked by others and seemingly unwilling to make any effort to become involved in the social affairs of the group. At the same time, however, Northway noted that some of these chil- dren energetically pursued interests in art, music, science, and hobbies. She also suggested that members of this latter group appeared quiet and uninterested in other children. As readers of this compendium might rec- ognize, Northway was already thinking about varying motivations that lay the basis for the display of socially withdrawn behavior – a rather prescient thought given current machinations about multiple forms and func- tions of solitude (e.g., Coplan et al., 2013).

Nevertheless, Northway made note that shyness could not be tolerated during a child’s summer camp expe- rience. Indeed, she claimed that the primary goal of summer camps was to improve the child’s social relation- ships and that camp was a venue within which children could build confidence; shy children were singled out as in need of improvement. Staff were instructed to use “careful observation” to identify the “timid” camper, while, at the same time, published camp bulletins glowed with reports of previously “quiet and withdrawn” children who became “happier and more self‐confident” because of their camp experiences (Wall, 2008).

It bears noting that the numbers of children who participated in Northway’s studies were, by today’s stand- ards, minimal at best. However, the constructs studied and the methods used to identify the personalities and peer reputations of the children (e.g., time and event samples of observed behavior; sociometric assessments) were ahead of their time. Indeed, the research (mostly unpublished and only available in the University of Toronto archives) conducted by Northway and her students could be regarded as the first program of research on the peer group reputation of children who are now described as socially withdrawn!

### Carmichael’s Mannal of Child Psychology, Third Edition (1t70)

In 1970, a two‐volume compendium arrived in my mailbox in State College, Pennsylvania – the third edition of *Carmichael’s Manual of Child Psychology* (Mussen, 1970). At the time, I was a young graduate student who had recently completed a master’s thesis on the topic of egocentric and self‐regulatory speech; a thesis derived

from the competing theories of Jean Piaget and Lev Vygostky about the functions and meanings of private speech (Kohlberg et al., 1968; Rubin, 1973) – a topic that I continued to study during the first decade of my career. At the same time that the *Handbook* arrived, I was about to propose a dissertation that was developed from ideas that were described in the empirical work of John Flavell (Flavell et al., 1968), on the topic of role‐ taking and perspective taking skills in childhood. The dissertation was focused on the development of differ- ent forms of perspective‐taking (much like different forms of “theory of mind” that exist today, Dennis et al., 2013; Rubin, 1973). As it turned out, both Piaget and Flavell contributed chapters to the *Manual*. I was thrilled.

*Piaget.* Piaget’s *Manual* chapter was basically a precis of his genetic epistemological theory of intelligence. As most readers of this volume must surely be aware, Piaget (1970) described “stages” of intellectual development that the child was propelled through by the functional invariants, *assimilation* and *accommodation*. These constructs were personally meaningful given my initial forays into the study of egocentrism and perspective‐ taking. Assimilation was deemed as a means to assure the continuity of existing cognitive structures, and the integration of new information into already existing schemas. For example, the young child who receives novel information during *peer interaction*, may be likely to maintain a sense of cognitive balance (equilibrium) by “translating” his or her novel social experiences into an already familiar, *ego‐centered*, understanding of that world. As a consequence, the primacy of assimilation helps the child maintain internal, cognitive balance (homeostasis); and yet, that balance is maintained by the child’s assumption that the way that others view particular aspects of social rules, norms, and behaviors is basically the same as the child’s own views.

Of course, the Piagetian argument (e.g., Piaget, 1932) was that if assimilation alone was involved in develop- ment, no new cognitive or social cognitive structures would emerge. Consequently, Piaget argued that for developmental growth to occur, assimilation must be counterbalanced by *accommodation*, or the modification of existing, assimilated cognitive structures. To Piaget, the primacy of assimilation meant that the child “remains centered on his own actions and his own viewpoint . . .the gradually emerging equilibrium between assimilation and accommodation is the result of successive decentrations which make it possible for the subject to take the points of view of other subjects themselves” (Piaget, 1970, p. 710). In short, according to Piaget, social cognitive development moved forward as a function of the child’s becoming socialized to view the social world through the eyes of others. The key term that captured my attention, was “*socialization*,” and socializa- tion necessarily occurred through the experience of *social interaction*. Of particular note, Piaget argued that it was through the interactions of conspecifics (in this case, *peers*) rather than through interactions involving authority figures (e.g., parents) that lead to the development of truly socio‐centered thought processes. In other words, according to Piaget, peers matter. This suggestion gives pause to those who are looking for a reason to be interested in children who, for whatever reason, do not interact with their peers.

*Flavell.* Significantly, it was Flavell who introduced many, if not most English‐speaking developmental scientists to Piaget’s theory in his classic text, “*The developmental psychology of Jean Piaget*” (Flavell, 1968). And it was Flavell who developed the first published program of research on what *he* labelled the study of “social cognition.”

One of Flavell’s major accomplishments was the development of research paradigms to assess various forms of “role‐taking, interpersonal inference,” “social cognition,” or more generally “people‐reading” skills (Flavell, 1970, p. 1027). To do so, Flavell and colleagues created methods and measures to examine others’ per- ceptual experiences (much akin to Piaget’s well‐known “three mountains task”); cognitive experiences, predis- positions, and capacities; and emotional/affective states. To Flavell, the ultimate purpose of studying the development of these social‐cognitive skills was to better understand why it is that, with increasing age, chil- dren become more cooperative, prosocial, and communicatively competent in the company of others.

These research paradigms gave rise to my own dissertation in which I assessed whether various forms of role‐taking (1) were intercorrelated within given age/stage groups (a test of Piaget’s notions of *horizontal and vertical décalage*, Piaget & Inhelder, 1967); and (2) improved with increasing age (Rubin, 1973). But perhaps more relevant to the subject matter of this volume, Flavell’s research provided the underlying rationale for my

development of a research program to examine whether children’s understanding of others’ thoughts and emotions was associated with the demonstration of social competence in, and acceptance by, the peer group.

*Other* Manual *influences.* To prepare for the writing of this chapter, I reread the 1970 *Manual*. My intention was to verify my belief that the study of social withdrawal did not exist, *in any programmatic fashion* prior to the 1970s. Indeed, I discovered that little mention was made of this construct in the two‐volume *Manual*. Instead, there were suggestions about the significance, not of withdrawn behavior, but rather of peer interaction and relationships. For example, following from Flavell’s chapter, the review by Martin Hoffman (1970) on the topic of *moral development* elaborated on Piaget’s contention that the natural give‐and‐take of discourse that occurs during peer interaction provides for the development of morality – a sense of justice and a respect of rules of the social order. With an increase of experiences in the company of peers, children were thought to become better able to understand principles of fairness, justice, and kindness.

Hoffman continued by suggesting that through peer interaction, children come to experience a sharing of deci- sion making, something that would likely not occur as often when interacting with parents. He also noted that peer interaction involved the *behavioral* taking of alternate roles and that which evolved was an understanding of the significance of reciprocity and mutual respect. In this regard, Hoffman pushed the thoughts of Piaget and Flavell from the development of an understanding of others’ perspectives to an understanding *of the processes* by which those social understandings developed. At the time that Hoffman wrote his *Manual* chapter, however, data simply did not exist to support the notion that peer interaction could promote thinking about, or behaving in, the social world. And, indeed, Hoffman, like Flavell and Piaget (among many other 1970 *Manual* authors) offered no suggestions about the social, social‐cognitive, emotional, or cognitive consequences of *a lack of peer interaction*.

Perhaps the most significant, and personally newsworthy chapter that appeared in the 1970 *Manual*, was titled “*Peer interaction and social organization*.” This chapter, authored by Willard Hartup, set the stage for the decades of research on peer interactions and relationships to follow. In his opus, Hartup cited Cooley (1902) as an original raison d’etre for attending to the significance of peer interaction in childhood. And as it happens, Cooley is among the very few sources, cited in the *Manual,* for his thoughts about the *lack of social interaction*: “. . . human nature is not something existing separately in the individual, but a group nature or primary phase of society Man does not have it at birth; he cannot acquire it except through fellowship, and it decays in

isolation*”* (Hartup, 1970, pp. 29–30).

Hartup also noted that much of the extant literature on early peer interaction was based on naturalistic observations of children in the company of peers. And although the numbers of children typically observed in any given study were very small by today’s standards (typically *N*s would be in the neighborhood of 10–40 participants!), a repeated finding was that, with increasing age (from two to five years), social participation in the peer group increased while *solitary and onlooker activities decreased* (e.g., Hattwick & Sanders, 1938). Perhaps the best known of these findings derived from the work of Mildred Parten (1932). Parten described six social participation categories that purportedly unfolded as children matured. In order of presumed maturity, these categories included: unoccupied behavior; solitary play; onlooker behavior (the child observes others but does not participate in the activity); parallel play (the child plays beside but not with other children); associative play (the child plays and shares with others); and cooperative play (the child engages others in interaction that is well coordinated and defined by a division of labor). From her data, Parten concluded that between the ages of two and five years, children engage in increasing frequencies of associative and cooperative play and in decreasing frequencies of idle, solitary, and onlooker behavior.

In spite of the very limited data base on which she based her developmental conclusions (a sample of only 40 children attending the University of Minnesota laboratory preschool), Parten’s (1932) social participation taxonomy and her reported findings dominated the literature concerning children’s *interactive* and *play* behav- ior for almost 50 years. Indeed, it became commonplace to characterize the typical three‐year‐old preschooler as a solitary or parallel player whilst referring to the typical five‐year‐old as spending much of his or her time in associative or cooperative play. In essence, Parten’s observational taxonomy provided the basis for my early research program on the topic of social withdrawal.

Returning to Hartup (1970), after having reviewed the existing literature on peer interactions, relationships, and social groups, six noteworthy research‐derived conclusions were derived:

1. It was assumed that the children who engaged, *most frequently*, in peer interaction were the most popular among their age‐mates. Researchers had shown that friendliness and sociability were positively associated with popularity among peers, regardless of the age group studied. However, there was no evidence for direc- tion of effect between frequency of social interaction and peer acceptance; virtually every published study was of a correlational ilk.
2. Little was known about the influence of peer play and social interaction on adaptive and maladaptive psy- chological development;
3. Researchers had paid scant attention to developmental differences and *change* in the demonstration of social, antisocial, and asocial behavior;
4. Cross‐cultural research was necessary;
5. The *lack of sociability* was not generally associated with the lack of peer acceptance (e.g., Elkins, 1958).

The latter conclusion is clearly relevant to the substance of this chapter. Also relevant was Hartup’s observa- tion that *anxious* fourth and fifth graders had been found to be less popular than non‐anxious children (McCandless, Castaneda, & Palermo, 1956) and that preschoolers who were highly compliant to adults could best be described as chronic worriers; cooperative and eager to please; deferential to persons considered supe- rior; and easily made anxious and upset (Crandall et al., 1958).

Perhaps the one *Manual* chapter that was most relevant to the study of social withdrawal was James Anthony’s review, “*Behavior disorders of childhood*.” In this chapter, Anthony described existing “taxonomies of behavior disorders in childhood.” He noted that these taxonomies did not derive from any particular theoretical perspec- tive; rather, they evolved from the “clinical experiences of individual practitioners” (Anthony, 1970; p. 672). Anthony also indicated that the symptoms that appeared in the taxonomy of disorders were neither stable throughout childhood nor consistently derived from empirical data! Nevertheless, two “classes” of behavior disorder described by Anthony are relevant to the substance of this chapter: (1) “*Affective behavior disorders*” comprising such sub‐classes as *fearfulness* (e.g., flight reactions) and *anxiety* (e.g., apprehension); and (2) “*Social behavior disorders*” comprising such sub‐classes as avoiding (e.g., *withdrawal*, self‐isolation) and dominance‐sub- mission (e.g., clinging).

In addition to the *conceptually derived taxonomy* noted above, Anthony noted that some researchers had begun to use an “actuarial approach” to classify childhood behavior disorders. Basically, this actuarial approach con- sisted of factor analyzing a large number of symptoms from corpora of existing data. Among the more familiar taxonomies was one that resulted from factor analyzing the symptoms and biographical data of 300 male and 300 female *child psychiatric patients*. In this work, Achenbach (1966) derived the now well‐known broad‐band classifications of *internalizing* and *externalizing* disorders. Of note, the former included such symptoms as anx- ious and *withdrawn* behaviors.

Finally, in reviewing the developmental course of behavior disorders, Anthony described several cross‐sec- tional and longitudinal studies. In almost all cases, the focus of the research was on the proclivities of various symptoms and symptom groups and whether symptoms tended to increase, decrease, or remain stable over time. Two particularly notable, and relevant, studies were identified. First, in the now well‐known investigation by Thomas and colleagues (1960; 1964), it was suggested that constitutional factors (*temperament*) formed the basis for the development of behavior disorders. Thomas and colleagues followed 128 infants until (at the time of the writing of the 1970 *Manual* chapter) they were 6 years of age. It merits noting that the sample was highly selected; it comprised, largely, a group of middle class, Jewish, professional families who had been seen at one specific clinic. Notwithstanding the obvious methodological pitfall, Thomas et al. noted that children could be reliably rated on nine specific characteristics, one of which was *withdrawal*. And the researchers indicated that this particular characteristic could be identified as early as the first or second year of life. Today, the Thomas et al. study represents a watershed moment in the study of the putative temperamental traits that may underlie the display of *behavioral inhibition* and social withdrawal.

Anthony also described a number of cross‐sectional and longitudinal studies, the most noteworthy of which was conducted by Morris et al. (1954). These researchers followed up with 34 children who had been identified, in a clinic, as “internal reactors” (shy, withdrawn, anxious) between 16–27 years earlier. Again, notwithstanding the obvious methodological weaknesses, the researchers reported that shy, withdrawn children “do not turn out too badly as adults, especially if they marry dependable spouses” (Anthony, 1970, p. 691)!

In summary, from the 1970 *Manual of Child Psychology*, it is clear that the study of the origins, concomitants, and consequences of social withdrawal had yet to undergo thorough examination. And although theorists had posited the significance of peer interaction for the development of social, social‐cognitive, and emotional devel- opment, *none had focused on that which a lack of social interaction might entail*. Furthermore, the extant research on the potential influences of peer interaction were compromised by the lack of longitudinal or experimental data. To this end, the contemporary study of social withdrawal began with a series of studies in the 1970s.

### Beginnings

In 1973, I accepted a position at the University of Waterloo. This was a heyday for young scholars. New univer- sities were springing up all over the continent and entry‐level faculty positions appeared available far and wide. My own situation, however, was rather unusual. The Psychology Department of the University of Waterloo moved into a new building in the year that I was hired; indeed, it was still under construction when faculty members began to move from their old offices located in a strip mall (!!) to a new building that housed animal labs (including rhesus monkeys); several observation labs; four mobile trailer labs that could be driven to schools for the collection of data; carpentry and electronic shops; a library dedicated to the memory of the founding Chair – Richard Walters (of Walters and Bandura fame); and extensive space that housed child size furniture and restrooms, as well as one‐way mirror facilities throughout this latter facility. During my initial negotiations with the Search Committee, I asked what the purpose of this “child sized” facility was and who it belonged to. No one could answer the question.

Upon learning that this space was unclaimed, I suggested the possibility that it could become an on‐campus preschool that could provide an early education to 3‐ to 5‐year‐olds from middle class (campus families mainly) as well as lower income homes. It could also provide an in‐house facility for faculty members to do research with the attending children and their families. And without blinking, I proposed that if I was given the oppor- tunity to get this school started; all I would need would be funds to (1) purchase whatever one requires to start a school (!); (2) interview and hire staff; and (3) purchase a bus and hire a driver to collect the children from the lower income homes. In turn, the department would receive income from tuition, as well as a government grant to fund the tuition costs for the lower income families. I was hired in July 1973; the school opened in January 1974!

##### The University of Waterloo Early Childhood Education Center

Prior to opening the doors of the new school, it was incumbent upon me to interview and hire staff. My goal was to find a trio of early childhood educators who were conversant with contemporary developmental theory and who had experience working with diverse groups of children and families. During the fall semester, teach- ers were hired. One of the newly hired teachers had received training in the British nursery school tradition. A second teacher, Louisa Dyck, had received a baccalaureate and certification in early childhood education. Thereafter, she co‐authored a manuscript on the topic of whether and how private, *self‐regulatory* speech could be observed and coded “in the wild” (Rubin & Dyck, 1980). A third teacher became a career‐long collaborator who began her career at the University of Waterloo by helping me to develop and assess the curriculum. And during the early years at Waterloo, *Linda Rose‐Krasnor* completed a master’s and doctorate under my direction (Krasnor & Rubin, 1983; Rubin & Krasnor, 1980).

The curriculum that we developed could be best described as neo‐Piagetian in nature. In brief, in accord with Piaget’s position that development is an active process of “construction” of knowledge rather than the passive

“absorption” of content, the goal of the curriculum was to provide preschoolers with opportunities to attain concepts designed to help their entry into the public school system. The goals fell into three general categories: cognitive development, psycho‐motor development, and *social‐emotional and social‐cognitive development*. In keeping with my growing interest in the roles that peers might play in child development, there was a special focus on the development of social‐cognitive and social skills. Specifically, we attempted to provide the children with opportunities to engage in unstructured and structured activities. The latter often took place in small groups during which teachers engaged in dialogues with children about interpersonal problems that occurred with greater or lesser regularity during everyday class activities. For example, a topic might be: “What can you do or say when someone else has a toy that you would really like to play with?” Another topic might be: “Sometimes you come into a room and see a group of kids who you would really like to play with. What could you do or say to join the group?” We would always attempt to gain group involvement by following each ques- tion with: “Now let’s say that that didn’t work, is there anything else that you could do or say?”

These are the sorts of issues that required the children to take into account different aspects of the social environment if they were to gain success in solving their “social problems.” For example, depending on target characteristics (e.g., the age and gender of the target) and the type of problem to be solved, one might fare better if one used less or more direct means and strategies. In short, we were engaging the children in perspec- tive‐taking skills training! In this regard, our curriculum resembled that developed by Spivack and Shure (1974) that had as a goal the development of social consequential and means‐ends thinking in preschoolers and kin- dergartners attending Head Start programs. And as is described in a later section of this chapter, our focus on social problem‐solving and social competence became a key component in our studies of social withdrawal (e.g., Krasnor & Rubin, 1981).

Eventually, one of the offshoots of this preschool program was the development of a series of assessment tools to gauge programmatic success. And given my strong belief that the gold standard for assessing social behavior and social competence derived from observing children “*in the wild*,” for every child interview or teacher assessment that measured *X*, we developed an observational taxonomy that would allow assessment of the same construct.

##### The 1970s: Studies of Play, Social Interaction, and Social Cognition

The first set of studies produced by my lab in the 1970s was focused on the premise that children’s social cogni- tions were actualized by their social interactions; and, in true dialectic fashion, these cognitions come to influ- ence children’s social behaviors. Thus, it was posited that within the more‐or‐less egalitarian peer system, children experience opportunities to examine conflicting ideas and explanations, to negotiate and discuss mul- tiple perspectives, and to decide to compromise with or to reject the notions held by peers.

In a series of studies, we discovered that: *observations* of preschoolers’ communicative competence were associ- ated positively with the *observed frequency of peer interactions initiated by the target child as well as with the frequency of social initiations received from preschool classmates*. It was also the case that the frequency of egocentric speech (col- lective monologues – basically speaking to oneself in the company of others) was *negatively* associated with the frequency of social initiations *received* by preschool classmates (Rubin, 1973). We also found that observed com- municative perspective‐taking skills (communicative competencies) were associated positively with acts of altru- ism (sharing and kindness; Rubin & Schneider, 1973). Although these studies were correlational in nature, we did establish a connection between the *frequency* and quality of peer interaction and the young child’s ability to take the perspectives of others. And in a manner of speaking, we were demonstrating that an observational index of peer acceptance (the frequency of communicative bids received *from* any given child) was associated with the demonstration of socially competent behavior (communicative competence). At the same time, we were begin- ning to demonstrate that communicatively incompetent speech acts (e.g., collective monologues) were associated with few initiations directed to the child from peers (an *“in the wild”* index of the *lack* of peer acceptance).

At about the same time that I was conducting these studies, I found myself teaching the introductory child development course to large numbers of undergraduate students. And when it was time to discuss the topic of

children’s *play*, I naturally referred to the then bestselling text (Mussen et al., 1970) and described, to my stu- dents, the one study that appeared to pervade the literature on the topic – Mildred Parten’s (1932) observational investigation of social participation. But given that I had an in‐house preschool within which to observe chil- dren, I found myself querying whether Parten actually studied play. Indeed, she referred to her taxonomy as one that assessed *social participation*. And it quickly came to my attention that others, such as Piaget (1962), had written extensively about the meaning of play.

Piaget (1962) in his book, *Play, Dreams and Imitation in Childhood*, described a taxonomic model for the devel- opment of children’s games. He distinguished three main types of ludic activities characterizing children’s games – namely: practice games, symbolic games, and games‐with‐rules. As well, he suggested that construc- tive games constituted “the transition from all three to adapted behaviors” (p. 110). These structural categories of play were subsequently refined by Sara Smilansky (1968), an Israeli psychologist who worked in early educa- tion settings. Smilansky suggested that the child moves naturally from one “stage” of play to the next “in keep- ing with his biological development” (Smilansky, 1968, p. 5). The stages Smilansky described included: (1) *Functional (sensorimotor) activities* in which the same movements are repeated with or without objects; (2) *Constructive activities* that involve the building or creating of something; (3) *Dramatic play* that involves engage- ment of non‐literality – a symbolic transformation and production of decontextualized behaviors (pretense); and (4) *Games‐with‐rules* in which there is a spontaneous acceptance of a division of labor, prearranged rules, and the adjustment to these rules.

With these new taxonomic features in mind, I began to ask what we might find if we merged the Piagetian categories of play described above with Parten’s six categories of social participation. The first four categories comprised *non*social or “*semi*”‐social play activities, including: (1) *Unoccupied behavior* – the demonstrated marked absence of focus or intent; (2) *Onlooker behavior* – the observation of others’ activities without attempt- ing to join peers in play; (3) *Solitary play* – playing apart from the other children at a distance greater than three feet, or with her/his back to other children; (4) *Parallel play* – the child plays independently; however, the activ- ity often, though not necessarily, brings him/her within three feet of other children.

Parten (1932) also defined two categories of socially interactive play. During *associative play*, the child inter- acts with other children and may be using similar materials, however, there is no real cooperation or division of labor. And finally, *cooperative play* comprising group activity organized for the purpose of carrying out some plan of action or attaining some goal. In our own studies of play, we combined the associative and cooperative play categories to create a single category that we designated as *social play*. We did so to obtain adequate inter‐ observer reliability (e.g., Rubin et al., 1976; Rubin et al., 1978). This new merging of the Parten and Piagetian taxonomies led to the creation of that which has become widely known as the *Play Observation Scale* – a time‐ sampling procedure that allowed us to examine *what it is that children* did when they were alone, near others, or with others while in a group context. It was the creation of this taxonomy that led us to ask, not only what these particular forms of social activity were associated with and predictive of, but eventually it also allowed us to ask whether Parten’s “immature” forms of social participation were necessarily associated with immaturity in the social‐cognitive, social, and cognitive worlds.

We began our focus on the *Play Observational Scale* (POS) with a number of studies centered on developmen- tal differences and changes, and the correlates of the various nested categories of the POS. For example, our first study was drawn from previous work by Moore et al. (1974) who reported that goal‐directed and construc- tive activities accounted for approximately 50% of all solitary play exhibited by kindergarten‐aged children. From this one finding, we sought to extend Moore et al.’s finding by investigating the forms of cognitive play behaviors that preschoolers displayed as they engaged in Parten’s (1932) social participation categories of soli- tary, parallel, associative, and group activity. A second goal, drawn from the findings of Smilansky (1968) was to discover whether differences existed between the free play behaviors of middle‐ and lower‐SES preschoolers. We were able to investigate SES differences because our new *Early Childhood Education Center* at the University of Waterloo was populated by both children from middle class, well‐educated backgrounds and from lower SES families who received government welfare subsidies. Given that the theme of this *Handbook* is on solitude, we report only those findings directly relevant to this construct.

Our findings revealed relevant social class differences, including that middle class preschoolers engaged in significantly more group play, more associative‐constructive and cooperative‐dramatic play, and in less solitary‐ functional play than their lower SES age‐mates. Of particular significance was our discovery that our data sup- ported Moore et al.’s (1974) finding that much of what children do while playing on their own is constructive and goal‐oriented. Across social class groups, 45% of solitary play was constructive in nature. But, as noted previously, the lower SES preschoolers did engage in far more solitary‐functional play (59%) than did their mid- dle SES age‐mates (32%). The “nugget” that appears most relevant for this *Handbook*, was the initial finding that solitary play may have both positive and negative “meanings.”

In a second study that focused on age differences in play, we found that preschoolers engaged in more unoccupied, onlooker, and solitary play, and in less group play than kindergarten‐aged children. Kindergarteners displayed significantly more dramatic and less functional play than preschoolers. On the other hand, preschoolers engaged in significantly more solitary‐functional and in less group‐dramatic activ- ity than kindergarten children (Rubin et al., 1978). And in a follow‐up, short‐term longitudinal study (Rubin & Krasnor, 1980), we examined *changes* in three‐ and four‐year‐old children’s observed free play periods over four time periods within a given school year. Among the findings most relevant to this chapter were:

(1) the quality of three‐year‐old children’s solitary play was less complex than that of the four‐year‐olds. Consequently, there was more solitary‐functional than solitary‐constructive play for the three‐year‐olds; (2) for all children, unoccupied and onlooker behavior decreased over time; (3) more children showed a decrease in unoccupied, onlooker, solitary‐functional play than would be expected by chance; and (4) the majority of children showed increases in group‐dramatic and group games over time. Notably, we con- cluded that since unoccupied and onlooker behavior had earlier been interpreted as being possible manifes- tations of anxiety, in the ethological literature (McGrew, 1972), their decline over time may have reflected an adaptation to the preschool environment.

By the arrival of the 1980s, the literature pertaining to the origins, correlates, and consequences of peer acceptance and rejection had become prominent in the field of social and emotional development (Hartup, 1983). There was, at the time, a burgeoning literature suggesting that sociometric indices of peer acceptance in middle and late childhood were associated positively with indices of social competence, and negatively with such social difficulties as aggression and poor perspective‐taking skills (Cowen et al., 1973; Goldman et al., 1980; Hartup, 1979); the prevailing evidence pertaining to a significant association between sociometric popularity and the *lack* of peer interaction was negligible (Asher et al., 1981). Given that my ongo- ing research using the POS and other observational taxonomies was indicating that, (1) *in vivo*, children who frequently interacted and initiated interactions with peers were more likely to be recipients of social bids from age‐mates whilst at the same time, those who *infrequently* interacted with or made social bids to peers were themselves not frequently receiving social bids from their age‐mates; and (2) given the theoretical and concep- tual arguments that peer interaction was a driving force in the development of children’s social and social‐cog- nitive competencies (e.g., Hartup, 1970; Piaget, 1932), I decided to challenge the extant writings of my sociometrically leaning colleagues and proposed a research project to the Ontario Mental Health Foundation. In that proposal, I sought funding to examine the social and social‐cognitive skills of socially withdrawn pre- schoolers and kindergarteners. This marked the beginning of what became known as the *Waterloo Longitudinal Project*.

### The Waterloo Longitndinal Project (WLP)

##### The Conceptual Basis for Studying Social Withdrawal

The proposal to examine the correlates of socially withdrawn behavior derived, in large part, from theoretical statements about the significance of *peer interaction* for normal social, emotional, and cognitive growth. The major theoretical source was Piaget’s aforementioned description that the young child was cognitively egocen- tric and unable to comprehend the thoughts, feelings, and visual perspectives of others (Piaget, 1932). During

the 1970s, researchers had been demonstrating that social perspective‐taking increases and egocentric thought wanes with age from early childhood to adolescence (e.g., Rubin, 1978a; Selman, 1980). Furthermore, it had been demonstrated that improvements in perspective taking skills were associated positively with indices of social competence (e.g., Iannotti, 1978; Rubin & Schneider, 1973). And *experiments* had revealed that peer exchange, conversations, social interchanges, and interpersonal negotiations produced *intrapersonal* cognitive conflict that led to improvements in perspective‐taking skills, a subsequent decline of ego‐centered thinking, and to decreases in aggressive behavior (e.g., Chandler, 1973; Damon, 1977; Doise et al., 1975; Iannotti, 1978; Rosen, 1974). Thus, by the close of the 1970s, it was becoming clear that children’s social interactions with peers provided an opportunity not only to establish egalitarian and reciprocal relationships, but also allowed children to understand the rules and norms of their peer subcultures. As such, it was not surprising that socia- bility in the peer group was associated with indices of peer acceptance and popularity (e.g., Cowen et al., 1973; Goldman et al., 1980).

Additionally, this understanding of norms and of normative performance levels was thought to engender, in the child, an ability to evaluate her/his own competency levels against the perceived standards of the peer group. Thus, in addition to facilitating the development of social competence and social‐cognition, peer inter- action was posited to enable the child to make *self‐evaluative judgments* and to understand the self in relation to significant others. This suggestion was fully in keeping with the classic theory expressed by Mead (1934), who had proposed that the ability to self‐reflect, to consider the self in relation to others, and to understand the perspectives of others was largely a function of participation in organized, rule‐governed activities with peers. Given these conceptual arguments declaring that peer interaction was a significant force in social devel- opment and in notions pertaining to the self, it was a rather short leap, in the words of one of my favorite Canadian singers of the late 1960s ( Joni Mitchell), to look “from both sides now,” and query whether the *lack* of social interaction in the peer group was a risk factor for adaptive social, social cognitive, and self‐development.

Another conceptual argument for developing a research program on the topic of social withdrawal derived from extant work on the distinctions between exploration and play made by those working within a human ethology framework (e.g., Hutt, 1979). The distinction between play and exploration, originally proposed by Berlyne (1960), had stimulated considerable discussion among investigators concerned with clarifying the sense in which play is intrinsically motivated. The distinction suggested a difference in the locus of control of the activity. In *exploration*, external stimulation brought on by a novel object dictates the activity, while in *play* the individual is in control. In exploration, the individual is asking. “What does this object do?” In the social world, exploration raises the question, “What does this person do?” or “What is this person all about?” In play, the question is, “What can I do with this object?” Or, in social company, the question of play is “What can I do with this person?”

It is important to note that theorists (Bruner, 1972; Hutt, 1979) had suggested that when children were con- fronted with novelty, they first explored; then they played. The serious business of exploration necessarily preceded the non‐serious, non‐goal‐oriented, flexible demonstration of play. And it was argued that as children moved through this sequence, they could become able problem solvers with the objects they came into contact with (Bruner, 1957; Hutt, 1979; Sylva et al., 1976).

###### Exploration → Play → Problem‐Solving

Drawing from this conceptual model of the sequence, I arrived at a rather simple question. What happens if young children fail to explore their *social* environments? Will they, inevitably become poor *social* problem solv- ers because they failed to engage in the process of social pretense?

In summary, the Waterloo Longitudinal Project (WLP) was guided by the belief that peers influence growth and development and that socially withdrawn children who, by definition, do not interact with their peers to a normal degree, may be deprived of opportunities that significantly influence later development. The particular foci of the first years of the WLP focused on the assessment, the stability, and the concurrent and short‐term correlates of social withdrawal during early childhood. Thus, what happens to children who,

*for whatever reason*, fail to take advantage of their opportunities to interact with peers? Will such socially with- drawn children fail to develop acceptable social skills? Will they fail to develop normal thoughts and feelings of self‐regard?

##### Phase 1 – Preschoolers and Kindergarteners

The first study published from the new project was once again focused on the Play Observation Scale (POS; Rubin, 1982a). In a manuscript entitled: “Non‐Social Play in Preschoolers: Necessarily Evil?” Parten’s assump- tion that *expressed* solitude in the company of familiar others indicated immaturity was questioned. In this study, the social, cognitive, and social‐cognitive correlates of nonsocial play were examined in a sample of 122 four‐year‐olds. Basically, each child was observed, using the *POS*, for six 10‐second time intervals each day over a 30‐day period. We made note of the child’s play partners and whether the child initiated a social interac- tion or was the recipient of an initiation attempt by a peer. We also noted whether these social interchanges were affectively positive or negative.

Other assessments included measures of peer acceptance, perspective‐taking, and interpersonal problem‐ solving (Spivack & Shure, 1974). In addition, we assessed the child’s ability to solve a problem that required the construction of a “tool,” with building blocks, to obtain a desirable gift that was just out of the child’s reach. And we measured child Mental Age using the Peabody Picture Vocabulary Test (PPVT). Teachers pro- vided an evaluation of psychological adjustment using the *Preschool Behavior Questionnaire* (PBQ, Behar & Stringfield, 1974). In a nutshell, the results indicated that: (1) *Solitary‐Functional* (sensorimotor) play was *nega- tively* associated with mental age, the number of social overtures received by peers, the number of peer con- versations, sociometric popularity, and the complexity of block constructions during the problem‐solving situation. In short, solitary‐functional play appears to be a risk factor index for preschoolers. (2) The incidence of *solitary‐constructive* play was negatively associated with the number of social overtures received by peers and the number of peer conversations. However, this index of solitary behavior was not associated with any of the risk indices that we measured. Given the lack of significant correlations with either the peer sociomet- ric ratings or with the teacher ratings of social competence, this category appeared to be somewhat benign and certainly less negatively tinged than solitary‐functional activity. (3) Typically, when fantasy or dramatic play occurs among four‐year‐olds it is usually carried out with or near other children. That is, the “norm” for this age group is the production of *social‐* rather than nonsocial‐dramatic play (Rubin, Fein, & Vandenburg, 1983). As such, *solitary‐dramatic play* at four years of age may reflect a lag in those social, cognitive, and social‐ cognitive skills typically associated with pretense activity. The results of the study indicated that the frequency of solitary‐dramatic play was *negatively* associated with the proportion of positive group interactions, the index of perspective‐taking skills, sociometric popularity, and with the complexity of block constructions dur- ing the problem‐solving situation. It was positively associated with the teacher rating of social maladjustment.

(4) *Unoccupied behavior* was positively related with teacher ratings of social maladjustment and negatively cor- related with the number of peer conversations. (5) And finally, *onlooker* activity was negatively correlated with MA, the number of peer conversations, and the complexity of play constructions.

Taken together, the data suggested that not all forms of solitude were associated with deficits in social, social‐cognitive, and cognitive competencies, a finding that appears to be in keeping with current conceptions pertaining to the suggestion that different *motivations* for solitary behavior are evidenced in the display of dif- ferent forms of solitary behavior. However, it must be noted that current perspectives on the motivations sup- posedly underlying solitary behavior are often misrepresented. That is, “motivations” that putatively “underlie” solitary behavior have often been confused with the actual *display of solitary behavior* such that many research- ers now refer to these motivational differences as representing different “subtypes of socially withdrawn behav- ior” (e.g., Bowker & Raja, 2011; Cheah & Xu, 2015; Coplan et al., 2017; Ding et al., 2015; Ladd et al., 2011; Nelson, 2013). And often, in these studies of “subtypes,” appraisals of motivations are drawn from question- naires given to children’s peers, teachers, or parents. Rarely are observations of solitary behavior actually car- ried out. Further, distinctions between *observed* behavior in the company of familiar versus unfamiliar peers are rarely made. And perhaps most importantly, developmental differences and *changes* in these motivations and

their associations with the observed expression of solitude are rare to nonexistent. Discussions of these issues may be found in current *Handbook* chapters (see Coplan, Oi, & Hipson, Chapter 8; Bowker, White, & Etkin, Chapter 10; Nelson & Millet, Chapter 11).

*Choosing extremes.* In our first funded study of social withdrawal, our sample included 126 four‐year‐old preschoolers and 111 five‐year‐old kindergarteners (Rubin, 1982b). Each child was observed during free play using the POS. The observational procedure was then used to target the children into one of three groups. Socially Withdrawn children were those whose nonsocial behavior (unoccupied, onlooker, and solitary behavior) was one standard deviation above the entire age group mean and 10% above their class mean for nonsocial behavior. Moreover, withdrawn children produced social behavior (i.e., group play and conversations) that was one standard deviation below the entire age group mean and 10% below their class means. Sociable children were those whose social behavior was one standard deviation above the entire age group mean and 10% above their class means. Further, sociable children produced nonsocial behavior that was one standard deviation below the entire age group mean and 10% below their class means. All remaining children comprised the Typical group. It bears noting that the Withdrawn preschool and kindergarten group engaged in socially interactive behavior only 10% and 13% respectively. These were clearly groups of children who did not often engage their classmates in social interaction. The major finding of note was that Sociable children initiated and received more social overtures than did their Typical and Withdrawn peers. In a sense, the receipt of social initiations from others represents an “in the wild” assessment of peer popularity.

Each child was also administered a battery of tests designed to assess cognitive, social, and social‐cognitive competency. The children were individually administered the following measures: (1) A measure designed to assess both quantitative and qualitative features of social problem‐solving, the Social Problem Solving Test (Rubin & Krasnor, 1983); and (2) a rating scale of sociometric acceptance Asher et al. (1979). The results indi- cated that the Sociable children were more sociometrically popular than both other groups, a finding in keep- ing with the observational data described previously. In addition, the Withdrawn group issued fewer solutions to the hypothetical social dilemmas and was more likely than the other groups to suggest that they would seek the aid of an adult to help them successfully manage social difficulties (such as obtaining a desirable toy from another child or making friends with an age‐mate; Rubin et al., 1984).

Subsequently, we paired a member of each group with a familiar Typical classmate who liked each other “just a little” (a moderate rating of likability). Each dyad met in one of the University of Waterloo trailer labs that had a furnished playroom as well as a separate “tech” room serviced with video and audio equipment. Discourse analyses revealed that the Withdrawn children were more likely than their more sociable age‐mates to use egocentric speech (collective monologues) when in the company of their dyadic peer. Furthermore, the data revealed that the distribution of children’s goals, the means by which they attempted to meet these goals, and the success rates of these strategies, varied between the Withdrawn and Typical children. For example, between‐groups differences were revealed for the total number of requests (e.g., “Can you give me that crayon?”; “Come over here!”) directed at targets (withdrawn children made fewer) and the proportion of direct requests (imperatives) produced (withdrawn children made fewer). Thus, Withdrawn children were observed to be less sociable and less assertive than their non‐withdrawn age‐mates (Rubin & Borwick, 1984; Rubin & Krasnor, 1986).

We also found that when young, *Withdrawn* children did issue requests, they were likely to be of a “low cost” nature; for example, they were more likely, than their *Typical* age‐mates, to try to get the attention of their playmates (e.g., “Look at this car.”) than to try to gain access to objects in their partner’s possession, to stop their partner’s activity, or to get their partner to join them in play (Rubin & Borwick, 1984; Rubin & Krasnor, 1986). The attention‐seeking goals, which comprised over 50% of the *Withdrawn* children’s social requests, required that their targets simply glance momentarily at the requestor; object acquisition and elicit action goals required active compliance from the targets and, as such, could be considered more “costly” to the targets. Thus, the social goals of *Withdrawn* children appeared to be “safer” or of lower “cost” to their play partners than those of their more sociable age‐mates.

Lastly, the *Withdrawn* children were *more* likely to *comply* with their partners’ requests than were the more sociable children. And despite issuing more “low‐cost” requests, it was the case that when *Withdrawn* children attempted to obtain partner compliance, they were more likely than their *Typical* counterparts to fail (Rubin & Borwick, 1984; Rubin & Krasnor, 1986). Indeed, given the high proportion of low‐cost goals, one may have predicted that the requests of *Withdrawn* children would have been more successful than those of the non‐ withdrawn children. This was not the case. Success rates for the withdrawn versus non‐withdrawn children were 54 and 65% respectively.

Finally, given that social interaction necessarily involves at least two partners, it is noteworthy that we found that the social goals, strategies, and outcomes *for the play partners* of the *Withdrawn* and *Typical* children *varied by dyadic grouping*. First, the goals of the partners of *Withdrawn* children were more costly than those of the partners of non‐withdrawn children; second, the strategies directed to *Withdrawn* children were more direct; third, the outcomes were more successful. These data confirm the emerging picture of the *Withdrawn* child as an unassertive, compliant youngster who age‐mates view as easily influenced and manipulated. Moreover, the picture painted by the results of this first dyadic study clearly demonstrated that young *Withdrawn* children *did* experience *rejection* in the form of noncompliance and nonresponsiveness. And in a nutshell, preschool and kindergarten *Withdrawn* children were found to be quiet, highly compliant, and submissive. They also experi- enced a higher than average degree of social failure. Perhaps the best way to characterize them is that they were “easy marks.”

##### Phase 2: Elementary School

In each of years from 1981 to 1984, support to continue following the young children described above was provided by separate grants from two Canadian grant agencies – The Ontario Mental Health Foundation and Health and Welfare Canada. Significantly, I was joined on the WLP by a newly hired faculty member at the University of Waterloo – Shelley Hymel. Hymel had previously studied with Steve Asher and had been very active in the field of sociometric research. From 1984‐forward, Hymel was a Co‐PI on the *WLP* grants from external agencies.

We began our 1980s continuation of the *WLP* by noting that little was known about the contemporaneous and longitudinal correlates of *observed* social withdrawal beyond the early years of childhood. Indeed, the num- bers of researchers who had studied observed social withdrawal could be counted on the fingers of one hand, and the major finding was that solitary behavior decreased with increasing age (e.g., Greenwood et al., 1982; Lyons et al., 1988; Parten, 1932). Given the consistent finding that observed socially withdrawn behavior decreased with age, we surmised that, if regularly displayed in the early and later years of elementary school (grades 2, 4, and 5), the negative “costs” of the behavior would increase. This legitimacy of this prediction was reinforced by research revealing that the expression of social withdrawal became increasingly salient to the peer group with increasing age (Ledingham et al., 1982; Younger & Boyko, 1987).

Drawing from our earlier findings that *young* socially withdrawn children were less successful in meeting their social goals in vivo, we arrived at the conclusion that any deviation from age group norms, vis‐à‐vis social withdrawal, would be accompanied by sociometrically assessed peer rejection. At the time, this suggestion was out‐of‐keeping with prevailing notions pertaining to the primary causes of peer rejection; special issues of *Child Development* and the *Merrill‐Palmer Quarterly* in 1983 had made it abundantly clear that the major predictor of peer rejection was aggressive behavior (e.g., Coie & Dodge, 1983; Coie & Kupersmidt, 1983; Dodge, 1983; Putallaz, 1983; Rubin, 1983). However, my colleagues and I believed, from our observational research, that rejection could be a consequence of a variety of phenomena, not the least of which was the behavioral expres- sion of social withdrawal (Hymel & Rubin, 1985). Indeed, we offered our alternative perspective of the con- comitants and consequences of social withdrawal at the first two meetings of the *Society for Research in Child Development’s Pre‐Conference Workshop on Peer Relations* in 1983 and 1985. At the time, “social withdrawal” was not included in the Society’s biennial meetings appendix of topics in its published program (it was not listed as a separate topic until the turn of the century!).

Lastly, as we made our way through the 1980s, we recognized that not all socially withdrawn children would be at risk for the development of negative outcomes. Consequently, we began to examine possible protective and risk factors associated with the phenomenon.

*Observing social withdrawal in elementary schools.* Because there were no opportunities to observe free play in elementary school classrooms, each grade 2 and 4 child was invited to play with three same‐sex age‐mates for four 15‐minute free play sessions in the above‐described trailer‐laboratory. The trailer was driven to local schools from the University of Waterloo campus, and children appeared happy to leave their classrooms in order to play in our mobile lab! The laboratory was equipped with toys and materials designed to “pull for” group cooperation (games); dramatic play (dolls and relevant doll‐play materials; action figures); constructive activity (Lego, puzzles); and sedentary, quiescent, solitary behaviors (e.g., books). The quartets were observed from behind one‐way mirrors; each member of the quartet was observed by one observer using the POS described above (e.g., Rubin, 1982a). All observers were blinded to data that were being collected concurrently on the children (e.g., teacher ratings; sociometric ratings). Significantly, *the child’s playmates differed in each of the four sessions*, thus allowing observations to be made with 12 different playmates. The construct of social withdrawal comprised the sum of the proportions of unoccupied, onlooker, and all solitary activity. In addition to this index of social withdrawal, we also noted who each child was playing with and who initiated each instance of social behavior.

*Peer ratings of social withdrawal.* In grades 2, 4, and 5 the children were administered *The Revised Class Play* (Masten et al., 1985). Children were requested to nominate up to three same‐sex classmates who would best fit each of 30 behavioral descriptors. Subsequently, nominations received from peers were used to compute each of three factor scores for each child following procedures described by Masten et al. (1985): *sociability‐leadership*, *aggression‐disruption*, and *sensitivity‐isolation* (CPISO). For each summary score, the number of nominations received by each child was standardized within class and gender groups to permit appropriate comparisons. Higher scores were indicative of stronger peer perceptions of the identified behavior in each case.

A close inspection of the items that comprised the CPISO factor revealed, however, that this factor actually had two sub‐clusters of items (Rubin, Hymel, LeMare et al., 1989; Rubin & Mills, 1988). Four of the items appeared to describe *anxious withdrawal* (“someone who would rather play alone than with others,” “someone whose feelings get hurt easily,” “someone who is very shy,” and “someone who is usually sad”), which reflected our conceptual- ization of a child who is socially isolated *from the peer group* (CPISOW). The remaining three items appeared indica- tive of peer rejection or isolation *by the peer group* (CPISOR, “a person who can’t get others to listen,” “someone who has trouble making friends,” and “someone who is often left out”). In support of this conceptual analysis, we factor analyzed the Revised Class Play in two large grade 2 and 4 Canadian samples (Rubin, 1985). These concep- tually distinct clusters of items *did* load on two orthogonal factors. As in Masten et al. (1985), the first two items on CPISOR noted above actually loaded significantly on *both* the aggression‐disruption and sensitivity‐isolation factors. Given these findings, and given that, at the time, peer rejection had been associated with high frequencies of aggressive and disruptive behaviors (Coie & Kupersmidt, 1983; Dodge, 1983) as well as with social withdrawal (French, 1988; Rubin et al., 1989), it appeared to us important to examine separately the *Revised Class Play* items that reflected rejection *by* peers and those that reflected passive, fearful withdrawal *from* peers.

*Correlates and concomitants of social withdrawal in elementary school.* By the age of seven years (second grade), children who were identified as extremely withdrawn had more severe difficulties than their younger, preschool‐ and kindergarten‐aged counterparts. Significantly, we did not find withdrawn second graders to be *sociometrically* unpopular among their peers. However, they were perceived by their peers as sensitive, shy, fearful, and withdrawn (Rubin, 1985; Rubin & Mills, 1988). We found also that teachers rated as withdrawn, anxious, and fearful those children *observed* and *nominated* by peers as most socially withdrawn (Moller & Rubin, 1988). Furthermore, in keeping with the Piagetian position that peer interaction aids in the development of social

cognitive prowess (Piaget, 1932), we found that socially withdrawn children were less able than their more sociable age‐mates to comprehend the perspectives of others (LeMare & Rubin, 1987).

We also observed seven‐year‐old socially withdrawn children while they played in dyads with a same‐age, same‐sex partner. The frequency with which each of the dyad participants displayed managerial and teaching behaviors directed at the play partner was coded (Rubin, 1985; Rubin & Krasnor, 1986). We took these particu- lar behaviors to reflect the degree to which children attempted to assert themselves and dominate their play- mates. We found that the socially withdrawn children were *less likely* to play the managerial or teacher roles than their dyadic partners, and when they did try to take the dominant role, they were more often rebuffed. In this case, just as we found in early childhood, observations of rebuff occurring in dyads suggested to us that withdrawn children did experience a form of in vivo *rejection* by their play partners. And given that the with- drawn children did experience a higher than average rate of social rebuff, it was not surprising that we discov- ered withdrawn children thought more poorly of themselves, in general, and of their social and social relationship competencies than non‐withdrawn children (Rubin, 1985; Rubin & Krasnor, 1986). Moreover, we surmised that, as a consequence of their in vivo experiences of social rejection, withdrawn children would come to believe that there is something wrong with themselves and that they would attribute their social fail- ures to internal causes. Supporting these conjectures, we found that extremely withdrawn children tended to blame social failure on personal, dispositional characteristics rather than on external events or circumstances (Rubin & Krasnor, 1986).

In summary, seven‐year‐olds who we identified *observationally* as extremely withdrawn were recognized as such by their teachers and peers. As an aside, it bears mentioning that in a related study conducted several years later, we discovered that, in addition to peers and teachers, *parents* of withdrawn second graders also perceive their children to be withdrawn (Rubin et al., 1996). Yet, these children were not rejected *sociometrically* by their peers. They were rejected, however, when they were *observed* attempting to meet their social goals during inter- personal interaction with their age‐mates. Furthermore, by the second grade, they were viewing themselves and their social skills and relationships in a negative light *and* they were blaming themselves for their social failures. Taken together, the corpus of data that we had collected from preschool to the second grade sug- gested that social withdrawal was a construct of developmental significance that is associated with an anxious, submissive interpersonal behavioral style reflecting internalized feelings of anxiety and negative thoughts about the self.

*Correlates and concomitants of social withdrawal in the fourth and fifth grades.* It is at this juncture that the construct of *social competence* merits definition. Given that the original goal of the *University of Waterloo Early Childhood Education Center* was to help develop preschoolers’ social competence, and given that researchers had consistently suggested that peer acceptance resulted from the demonstration of socially competent behavior (Dodge et al., 1986; see Hartup, 1983 for a review), Linda Rose‐Krasnor and I thought it wise to attempt a definition of the construct that we were studying extensively in our observational work (Krasnor & Rubin, 1983; Rubin & Krasnor, 1986). Our model of social competence took into account children’s social goals (e.g., joining others in play; obtaining a desirable object currently in the position of another); the means by which strategies are accessed and chosen to achieve these goals; the choice of, and production of strategic behaviors; the outcome of the initial social attempt; and the sequencing of goals and strategies following failure. In short, we noted that social competence involved the careful examination of the functional properties of social behavior ... a *goal* orientation, the employment of appropriate and acceptable *strategies* to achieve these goals, and the successful and effective *outcomes* of these strategies. Thus, our definition of social competence became: The ability to achieve personal goals in social interaction while simultaneously maintaining positive relationships with others over time and across situations. (Rubin & Krasnor, 1986; Rubin & Rose‐Krasnor, 1992).

Returning to the WLP, in late childhood (fourth grade) and early adolescence (fifth grade), we used the *Revised Class Play* (RCP) to identify extremely withdrawn individuals. Our data indicated clearly that our RCP index of anxious withdrawal, in both grades 4 and 5, were associated contemporaneously with (1) sociometric rejection; (2) negative self‐perceptions of social competence; and (3) self‐reported indices of both loneliness and

depression (e.g., Hymel et al., 1990; Rubin et al., 1993). In addition, teachers rated withdrawn young adoles- cents as being less competently assertive and more anxious and withdrawn.

But why did we discover these specific correlates of social withdrawal? The answer appeared to derive, in part, from the examinations of videos of dyadic free play interactions between extremely withdrawn kinder- garten, second, and fourth graders and *familiar*, non‐withdrawn, same‐age, same sex peers (Stewart & Rubin, 1995). In a nutshell, we found that the social initiations of withdrawn children became decreasingly assertive (the *strategies*), and noncompliance to their requests increased (the *outcomes* of social problem‐solving bids) from early to middle childhood. In short, with development, socially withdrawn children were becoming, by our definition, less socially competent.

Given these findings, we concluded that socially withdrawn children may (1) incur peer rejection on a con- tinual basis; (2) such negative experiences may produce unpleasant cognitions and emotions; and (3) as a result of frequent interpersonal rejection by peers, withdrawn children come to increasingly attribute their social failures to internal causes. In other words, they may come to believe that there is something wrong with them- selves rather than attributing their social failures to other people or situations. The combination of peer rejec- tion and internal (dispositional) attributions for peer noncompliance could be construed as creating a feedback loop whereby an initially fearful, withdrawn child begins to believe that his/her social failures are personality‐ based, and then these beliefs are reinforced by increasing failure of social initiatives or interactions. Ultimately, we concluded that the consequence of such cognitions may place the withdrawn child at greater risk for the development of increasingly negative internalized outcomes (Rubin & Stewart, 1996).

*The stability of social withdrawal.* It is one thing to describe the correlates of social withdrawal throughout the years of childhood; but, it is quite something else to examine whether the construct of interest is stable and to identify the associated characteristics and consequences of extreme solitude as expressed among age‐mates. I have already described how we selected extremely withdrawn preschoolers and kindergarten‐age children (see Rubin 1983, 1985 for details). Briefly, the percentage of our *observed* sample that could be identified as extremely withdrawn in preschool and kindergarten approximated 15%. In grade 2, using the same criteria as those for the preschool and kindergarten children, we found that 66.7% of those children previously observed and identified in kindergarten as extremely withdrawn, were likewise identified in the second grade (see Rubin, Hymel et al., 1991 for details).

A similar extreme‐groups targeting procedure was employed with the *Revised Class Play* (Rubin et al., 1991). Anxiously withdrawn youth were those whose CPISOW scores (socially isolated *from* the peer group) were one standard deviation above the age group *mean* and whose CPSOC (peer‐nominated sociability) scores were below the *mean*. These criteria resulted in the identification of 18%, 22%, and 23% of grades 2, 4, and 5 chil- dren, respectively as anxiously withdrawn. Of the extremely anxiously withdrawn children in grade 4 for whom data were available in grade 2, 69.23% of the children were identified as having stable anxious withdrawn sta- tus. And of the extremely anxiously withdrawn children in grade 5 for whom data were available in grade 2, the index of stability was 54.54%. Finally, of the grade 5 extremely anxious/withdrawn children for whom data were available in at least one of the previous years, stability was 66.67%. We also examined the stability of social withdrawal in a second way, by running a series of grade‐by‐grade correlational analyses. Grade‐by‐ grade correlations for peer assessed anxious withdrawal (CPISOW) were all significant at *p* < 0.001.

In summary, it appears as if social withdrawal in childhood is a relatively stable phenomenon. When *extreme‐group targeting procedures* were used, most children identified as extremely withdrawn in any given year appeared to have been similarly identified in earlier years. As it happens, this finding was in keeping with a 1980s study being conducted by Kagan on the topic of *behavioral inhibition* (Garcia‐Coll et al., 1984; Kagan et al., 1984; Kagan et al., 1988). Behavioral inhibition (BI) has been defined variously as (1) an inborn bias to respond to *unfamiliar* events by showing anxiety (Kagan, 1989); (2) a specific vulnerability to the uncertainty all children feel when encountering *unfamiliar* events that cannot be assimilated easily (Reznick et al., 1989); and (3) one end of a continuum of possible initial behavioral reactions to *unfamiliar* objects or challenging social situations (Kochanska, 1991; Stevenson‐Hinde, 1989). These definitions highlight some

common elements: BI is (1) a pattern of responding or behaving, (2) biologically determined, such that (3) when *unfamiliar* and/or challenging situations are encountered, (4) the child shows signs of anxiety, distress or disorganization. In plain language, behaviorally inhibited children are fearful and they withdraw when confronted by unfamiliar objects and people. Kagan and colleagues had argued that the developmental con- tinuity of inhibition, a phenomenon that will be discussed in more detail below, is strongest when the longi- tudinal sample comprises children who represent behavioral extremes. Year‐to‐year *Waterloo Longitudinal Project* (WLP) observational and peer assessments of withdrawal were consistently stable. Taken together, the relative stability reported in the WLP bolstered growing evidence documenting the longitudinal conti- nuity of social withdrawal and related constructs such as behavioral inhibition and shyness (Bronson, 1966; Kagan & Moss, 1962; Moskowitz et al., 1985).

*Risk factors associated with social withdrawal.* It is one thing to suggest that a phenomenon is stable; it is altogether different to argue that a given phenomenon is reflective of psychological risk. From the time that we were awarded grants from Canadian government sources to study the development of social withdrawal, the decision had been made to explore whether negative psychological outcomes could be predicted for withdrawn children and young adolescents. More specifically, we argued, from a theoretical/conceptual framework that social withdrawal suggested a prognosis of problems associated with social competence, peer acceptance, self‐ regard, and feelings of anxiety, loneliness, and depression.

To examine the veracity of this hypothesis, we used our earlier observations and peer assessments of nonso- cial play as continuous variables to predict later outcomes. These outcomes were derived from our develop- mental model in which it was suggested that internalizing problems should be the consequence of early insecurity/anxiety and social withdrawal; consequently, measures of depression, anxiety, loneliness and nega- tive self‐worth were chosen as logical outcomes. We began by examining the predictive relations between social withdrawal, as assessed in the second grade and indices of loneliness, anxiety, and depression in the fourth and fifth grades (Hymel et al., 1990; Rubin, Hymel, & Mills, 1989; Rubin & Mills, 1988). We found that children who had been observed to engage in solitary behavior subsequently reported negative feelings of self‐ worth, negative evaluations of their own social competence, and a high degree of loneliness in the fourth grade. Second‐grade solitude also predicted feelings of low self‐worth and depression in grade *5*.

In our final manuscript derived from the WLP (Rubin et al., 1995), we created an aggregate measure of social withdrawal in the second grade: *Social withdrawal* was determined by the summed standardized scores for peer‐assessed anxious withdrawal (Revised Class Play), teacher‐rated fearfulness and withdrawal, and observed solitude (from the POS, as described above for the second grade). We discovered that this aggregate of anxious withdrawal predicted ninth‐grade assessments of negative self‐perceptions of social and athletic competence and personal appearance; and feeling a *lack* of integration and involvement in their family and peer group. This latter finding was interpreted as reflecting a lack of felt security within the family and peer group in the teen years. Finally, composites of social withdrawal were calculated from *fifth‐grade* peer and teacher assessments of anxious withdrawal. The withdrawal composite was found to predict *ninth*‐grade self‐ reports of loneliness; felt insecurity in the peer group; and negative self‐perceptions of academic, social, and athletic competence.

*A caveat.* It is extremely important to note that the WLP comprised a sample of typical children. The findings described above supported a predictive relation between social withdrawal and *nonclinically* assessed outcomes. This left open the question of whether it would also prove possible to predict clinically assessed internalizing difficulties in early adolescence from earlier assessments of social withdrawal and negative social self‐ perceptions. As a start toward addressing this issue, the corpus of fifth‐grade data was reexamined (Rubin, 1993). All young adolescents with a *Child Depression Inventory* score (Kovacs, 1980/81) one standard deviation or more above the mean for their age group were identified. The fifth‐grade children so identified constituted the top 8% of the sample. These children were then compared with their nondepressed schoolmates on indices of social and emotional well‐being that had been assessed when they were in the *second* grade. Follow‐back

discriminant function analyses indicated that these children could *not* be distinguished from their typical counterparts on the basis of their popularity among peers in the second grade. Furthermore, they were neither observed to be more aggressive in their free play, nor rated by their teachers as more hostile and aggressive when in grade 2. The analyses revealed, however, that the depressed children could be distinguished from their typical counterparts on the basis of observed social withdrawal, peer assessments of social withdrawal, and self‐reported negative self‐perceptions of social competence. These analyses served to clarify and extend the previously reported correlational results concerning the predictive correlates of depression in early adolescence. Extremely depressed fifth graders were those who expressed less‐positive perceptions of their own social competence three years earlier, were observed to play alone, and tended to be viewed by their second grade peers as more socially withdrawn (Rubin, 1993).

*The WLP: A summary.* In summary, we began the WLP in an effort to make some sense of the controversies and discrepancies extant concerning the phenomenon of childhood social withdrawal. On the one hand, when we began the WLP, clinicians had typically noted that social withdrawal did not represent a risk factor for abnormal development (e.g., Ensminger et al., 1983; Kohlberg et al., 1972; Robins, 1966). And yet, there was a smattering of clinical intervention programs designed to prevent or ameliorate the supposed negative consequences of social withdrawal or to prevent or ameliorate the supposed negative problems supposedly reflected by the consistent display of nonsocial, solitary activity (see Conger & Keane, 1981 for an early review). Still yet, there existed developmental theories and data that extolled the significance of peer interaction for normal child development (Hartup, 1983). In our longitudinal study of typical, school attending children we demonstrated that *social withdrawal*: (1) is stable; (2) is associated concurrently, from early through late childhood, with measures conceptually reflective of peer rejection, observed social failures, felt insecurity, negative self‐ appraisals of social relationships and competence, dependency, and social deference; and (3) in concert with indices of negative self‐appraisal, significantly predicts internalizing difficulties in late childhood and early adolescence.

It is extremely important to note, however, that we had left several significant questions unanswered. These questions included such significant matters as: (1) Where did this phenomenon of social withdrawal come from? Was it a consequence of dispositional characteristics (e.g., temperament) already present prior to the preschool years? Could it have resulted experiences incurred with parents and with the quality of the parent– child relationship? (2) Do socially withdrawn children have friends? If they do, what is the nature of these friendships? What are the developmental consequences for those withdrawn children who lack friends (or who lack supportive, fun friendships? And (3) if social withdrawal represents a significant risk factor, what can we do (and when) to help these children?

##### The Magical Years: 1978–1987

*Stanford and its consequences.* During the years of WLP data collection, recognition of our work began to filter out. In the academic year 1978–1979, I was invited to spend a year at Stanford University where I had regular opportunities to meet with John Flavell and Eleanor Maccoby. And during that same academic year, I met two visiting scholars who played a significant role in my career from that time forward – Willard Hartup and Mavis Hetherington. In the company of these luminaries (e.g., each became President of the Society for Research in Child Development), I was able to share my ideas about children who refrained from social interaction and the developmental costs that they may endure, not only for their relationships with peers, but also for their own psychological well‐being. For example, I suggested to Flavell that children who could be described as socially withdrawn might demonstrate lags in social‐cognitive prowess. And to Hartup, I suggested that a lack of social and social cognitive skills when it was accompanied by peer’s perceptions of withdrawal as an anomalous behavior would likely result in peer rejection. My interactions with Maccoby and Hetherington resulted in *their* drawing attention to a missing dynamic in my planned research program – the influence of parents and families. As the reader will note in a section of this chapter that follows, their message was taken seriously.

After returning from Stanford, Hetherington endeavored to invite me to write the chapter on *play* for the new edition of the *Handbook of Child Psychology* (Rubin et al., 1983). Shortly thereafter, she invited me to become associate editor of *Child Development* beginning in 1981. I learned there and then that traveling to academic venues far distant from “home” could result in substantial benefits (see paragraphs that follow)! Insofar as *Child Development* was concerned, I was responsible for the areas of social and social‐cognitive development and all things peer‐related. Needless to say, this brought me into contact with a good many people invested in the study of peer relationships and social competence/incompetence. And when my stint at *Child Development* was close to ending, I was ready to enjoy periods of relief.

*SRCD 1983, Robert Hinde, and Washington 1984.* In 1984, I accepted an offer to visit the University of Washington. The invitation came from Mark Greenberg, who, at the time, was developing a social skills training program for young children. In this regard, the invitation made a good deal of sense. Not only was I interested in the “translation” of extant research on social competence, but Greenberg had been a student of Robert Marvin; Marvin had been a student of Mary Ainsworth who, herself, had been a student of John Bowlby. And over the years, I had developed a strong interest in the topic of relationships and had been carefully reading the writings of Robert Hinde. Hinde’s own human research program with nonhuman primates was, in many ways, kickstarted by Bowlby. And Bowlby’s introduction to the principles of ethology derived, in large part, from his meetings with Hinde beginning in 1954 (van der Horst et al., 2007).

Moving backward in time, when I was an undergraduate student at McGill University, I had decided to take a junior‐level course entitled “Motivation.” For reasons still unknown to me, the text for the course was Robert Hinde’s (1966) opus, *Animal Behavior*. The text introduced me to ethological theory and research and left me wondering how I might use observations “in the wild” in studies of children. Thus, from that time (1967) for- ward, I became a fan of Hinde and began to follow his writings on the topics of social interactions, relation- ships, and groups (e.g., Hinde, 1976a, 1976b, 1979; Roper & Hinde, 1978). Indeed, it is Hinde’s conceptual model in which he described the dialectical relations between levels of social complexity that has served as the primary influence on my program of research since the early 1970s. The levels described by Hinde comprise *individual characteristics* (e.g., temperament; race, sex), *interactions* (moving toward; moving against; *moving away from others*), and *relationships* (parent–child attachment; friendships), all occurring within *groups*. Significantly, Hinde also introduced me to the notion that each of these dynamic relations between successive levels of all things social operated within cultural, socioeconomic, and political contexts (see Hinde, 1987 for a thorough description).

And so, at a cocktail party (at the biennial meetings of the Society for Research in Child Development) hosted by the publishers of the 1983 edition of the *Handbook of Child Psychology*, I met Hinde. Throughout my professorial career, I had lacked a mentor; from that moment forward, Hinde became the major influence in all of my work to follow. Consequently, when Greenberg, via Marvin, via Ainsworth, via Bowlby (a mentor of Hinde’s) came calling, I accepted the invitation to visit the University of Washington.

The visit to Seattle brought me into contact, not only with Greenberg, but also with a research group that was part of a consortium being funded by the MacArthur Foundation. The cross‐national project was devel- oped to examine the effects of infant care on infant and toddler development‐at‐large. The Seattle site hosted the study of the causes and correlates of early attachment relationships! Shortly after settling in, I was invited to a meeting of the Seattle group at a time when the topic of group conversation was “Where do we go with attachment research after the age of two years?” When I was asked the question by the group, I suggested that a good place to start would be to examine the predictive relations between security of attachment and the future development of children’s peer relations and social skills. And I happened to mention that in my research- ing of the literature for my *Handbook* chapter on play, I had discovered that Singer (1973) had indirectly pro- posed a *possible* relation between infant security of attachment and later play dispositions. For example, he wrote that the responsive, “non‐smothering” mother would be more likely that the “smothering” mother to have a child who practiced independent exploration and play.

I also noted that Singer’s suggestion had received recent empirical support from the longitudinal, Minnesota‐ based research of Sroufe and colleagues (Arend et al., 1979; Matas et al., 1978; Sroufe & Waters, 1977; Waters et al., 1979). For example, the Minnesota group had found that securely attached infants at 18 months were more likely to explore their physical environments when in unfamiliar settings with their mothers than their insecurely attached counterparts (Matas et al., 1978). It was also the case that the Minnesota group had sug- gested that toddlers who were classified as having an insecure “C”‐type anxious‐resistant attachment history were guided, in their social interactions, by a fear of rejection. The upshot was that when C babies were placed in group settings with peers, they should attempt to avoid rejection through the demonstration of passive, adult‐dependent behavior and withdrawal from social interaction (Sroufe & Waters, 1977). At the time, the Minnesota group had already reported that an anxious‐resistant (C) attachment relationship predicted whinier, easily frustrated, and *socially inhibited behavior* at two years of age than a secure attachment relationship (Matas et al., 1978). It had also been discovered that anxious‐resistant C babies tended to be less skilled in peer interac- tion as toddlers and were rated by their teachers as more dependent, helpless, tense, and fearful than their secure counterparts (Pastor, 1981).

And so, at this meeting with the Seattle group, I suggested that these findings could be related to my ongoing research program on the development of social competence and social withdrawal. That first meeting in Seattle led to an introduction to Cathryn Booth‐LaForce, a lead researcher at the “attachment” site. We realized, almost immediately, that we shared common research interests and by 1986, along with Linda Rose‐Krasnor, we received funding from the NIH to examine, longitudinally (until 1994), the effects of attachment relation- ships and parenting on the development of children’s social competence.

Among the relevant products of the Seattle study were the following: We found that “setting conditions” (e.g., Bronfenbrenner & Crouter, 1983; Hinde, 1987) such as being economically disadvantaged, unemployed, or poorly housed produced sufficient stress in the family so as to interfere with the ability of a parent to be sensitive and responsive to the needs of a child (Booth et al., 1991). For example, we found that the frequent display of adult‐centered *intrusiveness* during interactions with their children, was significantly predicted by mothers’ experiences of negative life events and the lack of perceived social support. Furthermore, we found that insecure attachment relationships in infancy, especially under conditions of stress or risk, predicted coer- cive maternal behavior, which, in turn, predicted maladaptive peer interactions (Booth et al., 1991; Rose‐ Krasnor et al., 1996). On the other hand, security of attachment in infancy predicted displays of social competence with peers at age four years (Booth et al., 1991). And, similarly, we demonstrated that attachment security at age four years was related to the child’s concurrent social competence, as well as to social compe- tence and social‐emotional adaptation at age eight years (Booth et al., 1994).

Perhaps more relevant to the substance of this chapter, the taxonomies and paradigms that we developed to examine maternal behavior, as well as child behavior in the peer group, have stood the test of time; these tax- onomies have been implicated in research pertaining to the study of *behavioral inhibition* and *social withdrawal* for the past quarter century. For example, we developed the *Maternal Warmth and Control Rating Scale* – a fre- quently used observational measure in our studies of social withdrawal, aggression, and behavioral inhibition (e.g., Booth et al., 1998; Chronis‐Tuscano et al., 2015; Hane et al., 2008; Rubin et al., 2001). The measure com- prises assessments of parental proximity, positive affect, responsivity, positive control/guidance, hostile affect, negative affect, and negative control during interaction in both free play and structured maternal teaching situations.

Perhaps most surprisingly to readers familiar with the extant research on behavioral inhibition (BI), the pro- totypical “peers paradigm” in studies of the origins, correlates, and consequences of BI and socially reticent behavior was developed *in the Seattle study* (e.g., Rubin et al., 1994). At age eight years, participants were brought together in same‐sex, same‐age (+/– three months) *quartets*; the quartet members were unfamiliar to each other prior to the play session. The observational paradigm comprised several segments including a free play session involving the four children (20 minutes); a session during which each child was required to sort tickets cooperatively (10 minutes); and a session during which a single remote control vehicle was introduced to the playroom (20 minutes). This is precisely the paradigm that has been used in a multitude of studies of

behavioral inhibition, social reticence, and various forms of solitary behavior (e.g., Asendorpf, 1991; Fox et al., 2001; Henderson et al., 2004; Nelson et al., 2005; Rubin et al., 2002).

In summary, the Seattle study and the introduction of Hinde’s conceptual model of the dialectical relations between the constructs of setting conditions, individual characteristics, interpersonal interactions (or the lack thereof ), dyadic and group relationships and experiences, set the stage for all that was to follow in my program of research on the topic of social withdrawal.

*Munich, 1985.* In late 1984, I received a letter from a young researcher who was about to begin a postdoctoral career by studying the extent to which the construct of shyness was associated with the developmental course of children’s social relationships. In this letter, the young man introduced himself as someone who was schooled in personality theory and whose previous research experience involved the study of shyness in college‐age adults. He wrote that he was in a remarkable position to spend full time on a funded longitudinal research project; all he had to do was formulate an acceptable research prospectus. Unfortunately, the sample for the project comprised children, not adults, and he expressed openly a lack of knowledge in developmental psychology.

This young researcher outlined several notions he had about factors contributing to the development of shy- ness and its putative relation with the quality of children’s peer relationships. He requested that the reader of the letter provide some helpful commentary on the direction his thoughts were taking. As one of the several recipients of the letter (apparently, the author had posted his correspondence to a multitude of researchers studying children’s peer relationships), I recognized that the program of research proposed had the potential for producing numerous contributions to the rapidly emerging field of social withdrawal. My response was to applaud the proposal, while, at the same time, offering a number of conceptually and empirically based cri- tiques. My hard copy letter was met with an almost immediate response. I was invited to visit the Max Planck Institute (MPI) in Munich (Franz Weinert, Director) to consult with this young scholar, and his colleagues, about his proposed research. The young man with whom I consulted was Jens Asendorpf.

It is beyond the scope of this chapter to describe the full substance of Asendorpf’s significant contributions to the study of social withdrawal (and shyness). But a precis is necessary, simply because, for a decade, begin- ning in 1985, Asendorpf’s work (often coauthored with his post‐doc, Marcel van Aken), revealed data support- ive of the findings of the WLP. In the longitudinal Munich LOGIC study, for example, Asendorpf found that the abnormally frequent display of solitary activity in the company of familiar others, was: (1) relatively stable over time; (2) associated with observations of peer rebuff (Asendorpf, 1993); and (3) predictive of negative self‐regard vis‐a‐vis the child’s social skills and relationships (Asendorpf & van Aken, 1994). These findings were completely in concert with those generated in the WLP (e.g., Rubin, 1993; Rubin et al., 1995; Rubin et al., 1989; Rubin & Mills, 1988). Taken together, the results of these two longitudinal projects, drawing from data collected independently in two different countries and cultures, provided ample evidence that spending an abnormal amount of time alone, and not in the company of peers, carried with it both contemporaneous and predictive negative psychological baggage.

It does bear mentioning that Asendorpf’s multi‐factor models of shyness have been a significant source for those researchers currently probing the motivations that may underlie the display of socially withdrawn and/or inhibited behavior in familiar and unfamiliar settings (see Asendorpf, 2010; Asendorpf et al., 2009). The first type of shyness is basically akin to Kagan’s original biologically based construct, behavioral inhibition (Kagan et al., 1984). The second form of shyness is a product of self‐conscious processes that endeavors, in the individual, anticipations of rejection if one encounters age‐mates (see Hassan, MacGowan, Poole, & Schmidt, Chapter 2). The third form of shyness derives from cultural expectations pertaining to the demonstration of modesty and compliance (see Chen & Liu, Chapter 6).

Finally, Asendorpf (1993) suggested that some children might be motivated to withdraw from the social environment because they are, at the same time, both desirous of social company and yet fearful in the face of such company; these children are suggested to have high approach and high avoidance motivations. Others withdraw from social interaction because they prefer solitude; that is, these children have low approach and

low avoidance motivations. And yet others withdraw from social company because they have high social avoid- ance and low social approach motivations (for a description of these motivational hypotheses, see Rubin & Asendorpf, 1993a).

The invitation to spend time helping Asendorpf develop a longitudinal program of research on shyness and withdrawal not only resulted in one of the few childhood‐to‐adulthood studies of the consequences of these phenomena, but also to the very first edited volume specifically directed to ongoing research programs on social withdrawal and shyness (Rubin & Asendorpf, 1993b). The book resulted from a conference (in 1990) funded by the MacArthur Foundation. Contributors to the volume, in addition to Asendorpf and myself, included Jerome Kagan, Richard Davidson, Nathan Fox, Joan Stevenson‐Hinde, Shelley Hymel, and Dan Olweus among others. One of the “others” was Mary Ann Evans who contributed a chapter on communicative competence as a dimension of shyness. Evans had been one of my Waterloo graduate students who did not work, at all, on the WLP; instead, her research was focused on the development of communicative competence in childhood (e.g., Evans & Rubin, 1983). However, when she joined the faculty at Guelph University, Evans began a highly productive program of research on the topic of speech reticence, or the manifestation of the reluctance to speak up or talk in the context of the classroom (e.g., Evans, 1987). In some ways, Evans’ research picked up where the above described research on the types of requests and the frequency of social initiations of socially withdrawn children in the WLP left off (Rubin & Borwick, 1984; Rubin & Krasnor, 1986).

In sum, *Social Withdrawal, Inhibition, and Shyness in Childhood* (Rubin & Asendorpf, 1993b) was a landmark publication in which biology, temperament, attachment, parenting, peer interactions and relationships, social‐ cognition, communication, and culture were considered insofar as the development of social withdrawal and shyness were concerned. As the reader will note, from other chapters in this volume, the influence of the research described in the text simply cannot be ignored.

*Beijing, Colorado, and Killam 1987.* As the WLP was progressing, I was fortunate to have been elected to the Executive Committee of the International Society for the Study of Behavioral Development (ISSBD). The biennial meeting was held in Tokyo; however, a special workshop, organized by the ISSBD President, Harold Stevenson, took place in Beijing, China immediately thereafter. Most members of the Executive Committee were invited to the workshop in China, but so too were such luminaries as Jack Block (who also served as a mentor to Asendorpf during the course of the LOGIC Project), Norm Garmezy (one of the founding “fathers’ of the field of Developmental Psychopathology), Paul Baltes, Rainer Silbereisen, Dan Olweus, and Sandra Scarr, among others. It was good company to keep. The goal of the workshop was to introduce “Western research” in the area of Human Development to senior faculty members of major universities in the People’s Republic of China, many of whom had been separated from their families and incarcerated during Chairman Mao’s Cultural Revolution.

Each invitee was asked to make a five‐minute presentation about her/his ongoing research to the group‐at‐ large. I described the WLP and work on the development of social competence. As it happens, after each pres- entation by a Chinese scholar, one of two young men provided translation for the ISSBD troop. One of these young men proved to be a magnet for me; during his translations, he provided personal, oft‐times critical, perspectives on the quality of the research that had been described by the elder Chinese scholars. In my gut, I felt that, after the meeting, this young person would be sent off to some isolated part of the country, never to be found! But personally, I felt a kinship with him; he was smart, absolutely well versed in the English lan- guage . . . all he needed was a mentor and an opportunity to develop an independent program of research.

Eventually, the entire group was placed on multiple buses to visit the Great Wall of China. As soon as I left the bus, I decided to track down the young, outspoken man. In a way, I wanted to make certain that he was still alive! When I finally caught up with him on the Wall, I introduced myself, asked him what he was doing (he had recently earned a master’s degree, the highest graduate degree available at the time in China), and what his own research interests were (at the time, it was moral development). And I asked his name. After engaging in conversation for no longer than 10–15 minutes, I asked if he would be interested in obtaining his doctorate with me in Canada (and I promised him that I would find funding for his studies). The following year, I picked up

this young Chinese researcher at the Toronto Airport. And so began a life‐long personal and professional rela- tionship with Xinyin Chen (see Chen & Liu, Chapter 6)!

It bears noting that the University of Waterloo did not accept Chen’s original master’s thesis. He had to complete a thesis under my direction before he would be allowed to pursue doctoral studies in Canada. And so, Chen completed a cross‐cultural study in which he compared the relations between social problem‐solving skills (SPS) and sociometric status in Shanghai and Waterloo (Chen & Rubin, 1992). However, it was the next study that set the stage for the cross‐cultural study of shyness and social withdrawal for the next three decades. In that second study, Chen and I found that shyness‐sensitivity was significantly and negatively correlated with peer acceptance in the Canadian sample (as noted in the WLP findings described above). However, shyness‐sen- sitivity was positively associated with sociability‐leadership and peer acceptance in the Chinese sample (Chen et al., 1992). It would not be too much of a “stretch” to suggest that this study, and several others completed while Chen was a graduate student and post‐doc at the University of Waterloo (Chen & Rubin, 1994; Chen et al., 1995) were responsible for almost all current research pertaining to the study of both social withdrawal and behavioral inhibition in the People’s Republic of China.

Upon return to Canada after the 1987 ISSBD meetings, I spent three days catching up on some well‐needed sleep and then flew to Colorado where I had been invited by Cathryn Booth LaForce and others to keynote a meeting of those involved in the large, multi‐modal MacArthur Foundation study of the transition from infancy and toddlerhood to early childhood (Rubin, 1987). My presentation was focused on a newly devel- oped, Hinde‐relevant, conceptual and developmental, time‐sequenced model that linked environmental (SES, culture) and personal (e.g., parenting beliefs) setting conditions to such constructs as behavioral inhibition, attachment security, parenting, social withdrawal, peer rejection/acceptance, and a variety of outcomes across the period from infancy‐to‐adolescence (Rubin & Lollis, 1988). This conceptual model, in its original and revised forms, has guided my research on social withdrawal for over 40 years; it appears, in this chapter, in the final section.

Significantly, the MacArthur keynote brought me into the company of Jerome Kagan, who introduced him- self to me immediately after my presentation and asked if we could have a chat. Kagan had organized a study group to meet semi‐annually, at Harvard, to discuss what he referred to as “personality.” And during the meet- ings, Kagan invited me to join his study group and introduced me to Nathan Fox and Richard Davidson, both members of the Kagan “family.”

And so, within one month’s time, I had initiated a relationship that propelled my research on social with- drawal into the domain of cultural influence, and I had become a member of a group that would meet regu- larly to discuss the constructs of behavioral inhibition, emotion regulation, and respiratory sinus arrhythmia (RSA) – constructs that are associated conceptually and statistically with the expression of forms of social withdrawal in unfamiliar settings.

As if this was not enough good fortune, I also learned, in 1987, that I had become a recipient of a Killam Research Fellowship, one of Canada’s most precious academic awards; as it happens, I was the first Developmental Scientist to have received this award – a superbly gratifying experience. More importantly, this award provided me with the opportunity to spend the next two years solely on my research program and to use the funds as I saw fit. Almost immediately, I sought a post‐doc to help me work my way through the developmental model that I had presented at the MacArthur conference. The post‐doc was Rosemary Mills and the direction that we took was to examine the associations between parental beliefs and behavior, social withdrawal, and the self‐system.

### Parental Beliefs, Parenting, and Social Withdrawal: The Child in the 7amily Stndy

From 1986 to 1990, I was fortunate to receive funding to support a new direction in the study of social with- drawal – a project centered on: (1) understanding parents’ beliefs and cognitions about the origins and develop- ment of social withdrawal; and (2) examining the parental behaviors associated with children’s demonstration of socially withdrawn behavior among familiar others.

We began with the development of an information‐processing model in which we suggested that parenting behaviors are likely the product of a highly complex mix of factors (Rubin, Mills et al., 1989). For one, we posited that it is likely that *parental beliefs* influence parenting behaviors. We noted that parents’ beliefs concerning devel- opmental timetables and causes of development, the importance that parents attach to certain aspects of devel- opment, and parental cognitions about how children should best be socialized are all likely to be intimately associated with their choice of child‐rearing strategies. And we argued that these strategies play an important role in determining whether the child achieves social competence or develops problematic behaviors such as social withdrawal.

Toward these ends, we studied a sample of mothers and fathers, each of whom had a four‐year‐old child (Mills & Rubin, 1990). We re‐contacted as many of the mothers as we could two years later, when their child had reached the age of six (Mills & Rubin, 1992). In both phases of the study, mothers responded to hypotheti- cal scenarios involving their own children behaving consistently in an anxious‐withdrawn manner. For exam- ple, mothers were asked: (1) how they would react *affectively* if they had witnessed their preschooler consistently displaying socially withdrawn behavior among familiar peers over a month’s period of time; (2) to what causes they would attribute these solitary behaviors; and (3) what strategies, if any, they thought they would use to modify their child’s behavior. We also gathered information about socioeconomic status (indexed by the occu- pational status of the mother or father, whichever was higher), their recent experience of negative life events, and their supportive social contacts.

In the initial study (Mills & Rubin, 1990), we found that for hypothetical scenarios involving social with- drawal, mothers’ predominant emotional reaction to their child’s consistent display of social withdrawal was concern and puzzlement. Solitary behaviors were attributed, for the most part, to transient emotional states such as mood or fatigue. And mothers were more likely to explain withdrawal on the basis of dispositional (e.g., temperament) or constitutional causes. Finally, mothers suggested that they would most likely react to their child’s withdrawal with low power assertive techniques (e.g., redirecting the child). Significantly, mothers and fathers were mostly similar in the emotions, causal attributions, and behavioral reactions they thought they would have in response to their children’s displays of social withdrawal in early childhood.

In another set of analyses, we found that the parental choice of *highly directive‐assertive* parenting strategies to the child’s display of withdrawal could be predicted by: (1) the expression of intense negative emotional responses (anger, disappointment, embarrassment); (2) the experience of stress brought on by negative life circumstances; and (3) the perception that little social support was available to them. The availability of a social support network appeared to buffer the choice of coercive reactive strategies (Mills & Rubin, 1990). We also found that mothers who indicated that they would not respond at all to their child’s display of social with- drawal was predicted by their attribution of withdrawal to a trait (“my child was born this way”) and mothers’ experience of many stressful and negative life events.

This initial study was followed by a comparison of socialization beliefs of mothers whose preschoolers were either *extremely* withdrawn or “typical” (Rubin & Mills, 1990). Compared to mothers of non‐withdrawn chil- dren, mothers of withdrawn children were more likely to suggest the use of high control strategies (e.g., direc- tives) and less likely to prefer low‐power strategies (e.g., redirecting the child) and indirect‐no response strategies (e.g., seeking information from others, arranging opportunities for peer interaction, not responding) in reac- tion to their children’s demonstration of socially withdrawn behavior. Also, these mothers were more likely to attribute the consistent display of social withdrawal to dispositional sources; and they expressed more disap- pointment, embarrassment, and guilt about their children’s displays of withdrawal.

The finding that these mothers placed greater importance on a directive approach to teaching social skills than did mothers of typical children, and that they were more likely to choose controlling strategies for dealing with unskilled social behaviors, suggested to us that children who are socially wary tend to have mothers who may be overinvolved and overcontrolling. The causal attributions and emotional reactions of these mothers were also indicative of overinvolvement and provided some tentative insights about why they may be overin- volved. This dynamic was reminiscent of the pattern of anxious, overprotective parenting, which had previ- ously been linked to internalizing difficulties in children (Parker, 1983). At the time, we speculated that mothers of socially withdrawn preschool‐age children transmit their own internalizing problems to their children

through overinvolved parenting, which creates a sense of felt insecurity. Indeed, in a study that we were doing concurrently with Zahn‐Waxler and colleagues, we found that preschool‐age children of depressed mothers exhibited significantly more anxiously withdrawn forms of play with playmates than did children of nonde- pressed mothers (Rubin, Both et al., 1991). Further, we speculated that it may be that mothers are highly sensi- tized to their children’s social and emotional characteristics, and such sensitivity may provoke well‐meaning overcontrol and overinvolvement.

Our prediction that parental overcontrol and overinvolvement was associated with, and predictive of anx- ious withdrawal (and behavioral inhibition) became part and parcel of our research program during the 1990s and the new millennium. These predictions pertaining to parental overcontrol and overinvolvement were examined in the *Child in the Family Project* by identifying three groups of elementary school‐aged children for whom we had collected both parent and peer ratings. In this study, we examined the cognitions, the socioeco- logical circumstances, the psychosocial resources, and the behaviors of mothers who had a five‐ or a nine‐year‐ old child who had been identified as withdrawn‐internalizing or average in social competence. Peer‐nominations and teacher ratings of children’s social behaviors were used to identify these groups of children (see Mills & Rubin, 1993 for details).

First, we found a difference between the target groups in the amount of *importance* mothers placed on their proactive socialization practices. The mothers of Withdrawn‐Internalizing children placed significantly more importance on *directive teaching* than did the mothers of the Typical group, for four social skills (getting acquainted with someone new, resolving peer conflicts, getting accepted into a new play group, persuading others to do what one wants).

Next, we compared the target groups with respect to the extent to which they suggested each of several types of strategies for dealing with a hypothetical situation in which their child was behaving, among peers, in a socially withdrawn manner. The analyses revealed that mothers of Withdrawn‐Internalizing children were significantly more likely to report high‐power strategies in response to their children’s behaviors in the hypothetical situation than the mothers of Typical children. Conversely, the mothers of Withdrawn‐ Internalizing children were less likely to report indirect‐no response strategies than were the mothers of the Typical children.

Our third set of data analyses revealed significant differences between the target groups with respect to two types of causal attributions: attributions to a trait in the child and to age‐related factors. Mothers of Withdrawn‐ Internalizing children were significantly more likely than mothers of Average children to attribute withdrawal to a dispositional *trait* in the child. Our fourth set of analyses indicated significant differences between the tar- get groups with respect to mothers’ reported *emotional reactions* to socially withdrawn behaviors. Not surpris- ingly, mothers of Typical children were significantly more puzzled about displays of withdrawal than the mothers of Withdrawn‐Internalizing children. Mothers of the Withdrawn‐Internalizing children reported a stronger *anger* reaction to these behaviors than did the mothers of Average children. Finally, mothers of Withdrawn‐Internalizing children reported stronger feelings of disappointment, embarrassment, and guilt about displays of withdrawal than the mothers.

Finally, Mills and I found that, relative to mothers of typical children, mothers of extremely withdrawn chil- dren (aged five to nine years) were *observed* to direct significantly more *behavior control* statements to their chil- dren (Mills & Rubin, 1998). Further, mothers of withdrawn children used more *psychological control* statements (defined by devaluation statements or nonresponsiveness to the child). In this regard, maternal overcontrol encompasses not only restrictions on child behavior, but also manifestations of anxiety and concern that con- vey a lack of confidence in the child (Mills & Rubin, 1998). Parental overcontrol was also thought to be accom- panied by expressions of criticism and disapproval that attack the child’s sense of self‐worth.

*Summary.* Our findings from the *Child in the Family Study* painted a remarkably consistent picture of mothers whose children are socially withdrawn. Our data revealed, for the first time, to our knowledge, that there was an empirical link between indices of parental overcontrol and anxious‐withdrawal. Our findings left us with two important questions. First, *when* do mothers begin to display overcontrol and what is it that provokes such behavior? Second, do mothers of socially withdrawn children continue to evidence overcontrol in their beliefs

and behaviors as their children move into the adolescent years? The first question was addressed in the Waterloo Toddler Study; the second as examined in the *Friendship Project* after I moved from the University of Waterloo to the University of Maryland (Booth‐LaForce et al., 2012).

### The Waterloo Toddler Project

I was introduced, intimately, to the construct of behavioral inhibition (BI) when I joined the MacArthur Research Group on Temperament in 1988. The Director of the group was Jerome Kagan; members included Richard Davidson, Nathan Fox, Grazyna Kochanska, Steve Reznick, and Nancy Snidman. On one memorable occasion, in the spring of 1989, dinner conversation turned to the topic of the sequelae of BI as children moved from toddlerhood to the preschool years. I remember describing the work that I had done with preschoolers at the outset of the WLP and in the Seattle study. The following afternoon, as an invited speaker was offering a presentation on brain functioning and BI, I jotted down a script for a paradigm that could be used to examine the preschool behavioral sequelae of toddler BI. I handed the script to Nathan Fox.

In the script, I basically described the paradigm that we had used to examine peer interaction in the Seattle Study. But this time, I suggested that the session should include a same‐sex quartet comprising a previously (as a toddler) identified inhibited child, an extremely uninhibited child, and two “average” children, none of whom had previously met. I described a first session of free play, followed by a clean‐up session, a collaborative ticket sorting task, a session during which each child would stand up and give a speech about her/his previous birth- day party, and then a final session of free play during which a single, attractive toy would be made available to the quartet. Most of these sessions were taken directly from the Seattle study.

Within a matter of months (1990), Nathan Fox and I received initial funding from the MacArthur Foundation to conduct pilot work on the relations between frontal brain asymmetry, BI, and social compe- tence in preschoolers. One year later (1991), we received a more substantial grant from NIH to conduct a more thorough examination of these aforementioned relations. And finally, in that same year, I received funding from the Social Sciences and Humanities Research Council of Canada to examine the development of BI in a Canadian sample. In this latter project, I proposed to examine BI in two settings: (1) the paradigm that Kagan, Fox, and others had used in their studies (none of which involved the examination of toddlers in the company of age‐mates; few of which focused on parental behavior; e.g., Fox et al., 1995; Fox et al., 2001); and (2) a paradigm that allowed the observation of extremely inhibited or uninhibited toddlers in a play session in the company of a “typical” same‐sex toddler. In this chapter, I will focus solely on the Waterloo‐based project.

To begin with, the purpose of the *Waterloo Toddler Project* was, explicitly, to examine the relative contribu- tions that dispositional or temperamental factors *and* socialization factors make to the development of anx- ious/social withdrawal in early childhood. Specifically, I proposed to examine whether BI, at two years, predicted social withdrawal, in one form or another, during the preschool period. I also suggested that BI, as assessed by Kagan, Fox, and others, was insufficient, in and of itself, to predict the *consistent* production (across settings and time) of extremely withdrawn and anxious behavior and its concomitants (negative self‐evalua- tion, loneliness, depression). Rather, I predicted that *over‐reactivity* to novel stimulation (as assessed behaviorally and *physiologically*) *in concert with* the experience of overcontrolled parental caregiving and an insecure parent– child attachment relationship at two years would predict social withdrawal and its concomitants at four years. And significantly, I suggested that the traditional BI paradigm in which a toddler and her or his mother are introduced to an unfamiliar room containing novel toys and is, thereafter, introduced to a sequence of situa- tions involving unfamiliar adults, a robot, and a clown may not be the most appropriate procedures in which to examine predictors of subsequent withdrawal from the *social world of peers*. Rather, I suggested that BI, as assessed in the company of an unfamiliar, same‐sex, same‐age unfamiliar peer may prove to be a stronger pre- dictor of subsequent social withdrawal than the standard paradigm. Indeed, I suggested that it was a com- pletely open question as to whether extremely inhibited toddlers, as identified in the traditional BI paradigm would be so identified in a play session with a peer.

To address these questions, while at the same time collaborating with Fox and his colleagues at the University of Maryland, I had to find the right mix of personnel to meet the primary goal of predicting socially withdrawn behavior from the toddler to preschool years. I began, almost immediately, by finding a Lab Manager, Shannon Stewart, who was a clinical psychology doctoral student at York University in Toronto when she arrived in Waterloo. In due time, I became her doctoral advisor (Stewart & Rubin, 1995) and eventually her post‐doctoral mentor. Stewart (1992–1995) was responsible for the recruitment of participants and the supervision of a tal- ented group of undergraduate interns who aided in the exercise of data collection. But prior to Stewart’s arrival, I was surrounded by a bevy of graduate students who became involved, not only in the Waterloo study, but also in the collaborative work with Nathan Fox. They merit mention prior to describing the results of the *Waterloo Toddler Project*.

To begin with, *Xinyin Chen* was the senior member in the lab when the BI studies began. Although he was primarily involved in the completion of his doctoral dissertation (Chen & Rubin, 1992), Chen was awarded a post‐doctoral fellowship (1992–1993) and spent the academic year contributing to the data gathering process of the new inhibition project. Perhaps more importantly, he studiously learned the methods, measures, and cod- ing schemes associated with the project. This allowed him to replicate the toddler study, in China, when he left Waterloo to assume an Assistant Professorship at the University of Western Ontario in 1993 (Chen et al., 1998). In 1990, as I was sitting in my office surrounded by posters of my favorite ice hockey team (the Montreal Canadiens), a new graduate student who had been assigned to study with another faculty member knocked on my door. Within moments, I learned that he was from Montreal, studied at McGill, grew up a few blocks from my parents’ home, and had a cousin who had been in my teen friendship network. After I described my ongo- ing programs of research, he expressed an interest in joining the lab. And so began my 30‐year relationship with *Rob Coplan*. Coplan did not join the *Waterloo Toddler Project* team; instead, he became a vital member of the BI project being conducted, with Nathan Fox, at the University of Maryland. Coplan completed his master’s thesis with the Maryland data, noting differences in the “meanings” of different forms of solitude. For example, he found that reticent behavior (unoccupied and onlooker activity whilst in the company of *unfamiliar* peers) was associated with indices of shyness and anxiety whilst the other forms of solitude (labelled “solitary‐passive” and “solitary‐active” behaviors) were not (Coplan et al., 1994). This marked the beginning of Coplan’s career‐long interest in the psychological meanings and underlying motivations of different forms of solitude (see Coplan,

Ooi, & Hipson, Chapter 8).

Another graduate student who joined the lab to participate in the toddler inhibition project was *Heather Henderson*. Henderson arrived in 1994 when the project had received a second round of funding. She partici- pated in the collection and coding of maternal behavior, emotion regulation, and RSA data for both the two‐ and four‐year studies. In 1996, Henderson entered the doctoral program at the University of Maryland and completed her dissertation with Nathan Fox (Henderson et al., 2004). In her dissertation, she found that reti- cence at four years could be predicted by contemporaneously assessed physiological markers of emotion dys- regulation as well as by observed toddler BI. Significantly, she also found that a subset of preschoolers whose nonsocial behavior could be best characterized as “solitary‐passive” (solitary constructive and exploratory play) were similarly dysregulated and displayed high levels of BI at 24 months, suggesting that some children may engage in solitary‐passive behaviors as a strategy for coping with feelings of unease. These findings bear signifi- cance to those who argue that some behavioral forms of solitude (e.g., solitary‐passive behavior) are seemingly harmless and merely reflect behavioral manifestations of introversion or a preference for solitude. Henderson’s findings suggest that to draw such conclusions, one must be aware of the physiological underpinnings of these behavioral displays (in this case, physiological indicators of emotion dysregulation). Some forms of withdrawal that have been suggested to represent a preference for solitude (or possibly, introversion), may actually reflect a coping mechanism to deal with social anxiety.

The post‐doc who led the four‐year follow‐up of the *Waterloo Toddler Project* was *Paul Hastings*. Hastings, like Rosemary Mills, was a graduate student of Joan Grusec at the University of Toronto. He is now internationally known for his research on biopsychosocial models of the links between socialization experiences, neurobio- logical regulation, and the development of social‐emotional well‐being and difficulties (e.g., Hastings et al., 2014). And finally, one of the undergraduate interns who worked on the four‐year follow‐up of the

inhibited toddlers was *Charissa Cheah*. Cheah’s major focus was on the observed maternal behavior of inhibited and reticent children. In 1995, she joined me as my first graduate student when I moved to the University of Maryland. Her dissertation replicated the Mills and Rubin (e.g., 1990) work on maternal beliefs about socially withdrawn behavior; however, her interests were in comparing maternal beliefs across cultures, and more recently, has extended this work to the context of immigration (see Xu, Cheah, Hart, & Seo, Chapter 21; Cheah & Rubin, 2004).

The *Waterloo Toddler Project* can be summarized in the following manner. To begin with, the primary goal of the project was to examine whether BI at two years predicted solitude among unfamiliar peers and inter- nalizing difficulties at age four years. As a significant aside, we wanted to examine whether BI, assessed in the traditional manner (Kagan et al., 1989) was associated, in any significant manner, with the expression of *BI in a peer context* (Rubin et al, 1997). Third, we sought to explore whether *BI*, as assessed in the company of an unfamiliar two‐year‐old peer predicted reticent behavior at four years and whether parenting behaviors were contemporaneously associated with toddler BI and predictively related to the demonstration of reticence at four years. Fourth, we were interested in identifying physiological, temperament, and attachment‐related characteristics that were contemporaneously related to the expression of BI at two years and predictive of reticence at four years.

The results were striking given the extant findings from the previous literature on BI (see Rubin et al., 1997). To begin with, when extreme groups of inhibited toddlers were identified (using procedures published in previ- ous work by Kagan, Fox, and others), no more than 30% of toddlers highly inhibited in either the traditional or peer‐social context showed such levels in the other context. Put succinctly, fear of an unfamiliar adult with novel toys is neither identical to, nor reliably associated with, fear or wariness of an unfamiliar peer.

From our results, we contended that those toddlers at greatest risk of future problems of social withdrawal and its concomitants (e.g., negative self‐perceptions of competence; see Rubin et al., 2009 for a review) would be those who demonstrated extremely inhibited behavior *across* contexts. Unlike toddlers who were inconsist- ent in their displays of BI, *consistently* inhibited toddlers expressed significantly more inhibited behavior in the peer context than did those identified as extremely inhibited in only the toddler‐peer paradigm. Further, tod- dlers who were inhibited in *both* contexts, compared to Average and/or Uninhibited toddlers, were more tem- peramentally fearful (as assessed by a questionnaire completed by mothers), showed greater distress to separations and reunions with their mothers, and had *oversolicitous* mothers who were warm but intrusive, controlling, and not responsive to their toddlers’ cues. Additionally, compared to both traditionally and peer *BI* children, *consistently* Inhibited toddlers had more oversolicitous mothers.

In our follow‐up study at four years (see Rubin et al., 2002), we found continuity from assessments of BI at two years to specific forms of solitary behavior at four years. For example, neither two‐year traditionally assessed nor peer BI predicted solitary‐passive or solitary‐active behavior (Coplan et al., 1994; Rubin, 1982a,b), during free play, a clean up the room session, and a cooperative construction task that involved unfamiliar, same‐sex peer quartets at four years. However, the preschoolers who stood aside and watched their peers from afar (social *reticence)* were those toddlers who refrained from interacting and approaching unfamiliar toddler *peers* as well as unfamiliar adults and objects.

Another finding of significance pertained to our observations of maternal behavior. Until we conducted our BI study, there had yet to be a published paper on the role that early parenting played in predicting reticent behavior in preschoolers. Studies of the association between parenting and preschoolers’ solitary behavior had all been contemporaneous in nature (e.g., Mills & Rubin, 1998). In *Waterloo Toddler Project*, constructs of *mater- nal overcontrol* comprising observed warmth and solicitousness along with inappropriate intrusiveness and con- trol, *and maternal derisiveness* comprising scolding and public derision of their children, were found to moderate the association between toddler inhibition and preschool reticence. If mothers behaved in either a psychologi- cally controlling or a derisive manner, then toddler peer inhibition predicted social reticence. For mothers who were neither psychologically controlling nor derisive, there was no significant relation between toddler peer inhibition and social reticence.

Intrusive psychological control and derisiveness are similar to the constructs that comprise the control and affective aspects of *authoritarian* parenting. In this regard, mothers undermine the development of competence

and independence in vulnerable children by not allowing them adequate opportunity to practice and improve their skills (*overcontrol*). Or mothers can implicitly or explicitly “tell” their young children that they are incom- petent or behaving poorly (*derision*). These maternal behaviors may work hand‐in‐hand to chip away at the child’s sense of self‐regard, as well as his/her belief that a secure base is available from which they can safely explore the world.

In many ways, our data were consistent with those described by Kagan and Moss (1962) in their ground- breaking monograph *Birth to Maturity*. In that volume, Kagan and Moss reported that *shyness* in female adults was associated with mothers’ *retrospective* reports of protection of the child between birth and age three years. Other clinical, *retrospective* reports had shown that shy adults viewed their parents as overprotective, intrusive, and more likely to use shame induction than their normal counterparts (e.g., Arrindell et al., 1983; Bruch & Heimberg, 1994). Taken together, our findings and these retrospective studies suggested to us that further pro- spective, longitudinal research was necessary to examine whether parental behavior can moderate the influ- ence of toddler inhibition in predicting later childhood, adolescent, and adult outcomes. To this end, our collaboration with Nathan Fox allowed us to “follow” inhibited toddlers until the mid‐childhood years. In this work, we found, indeed, that maternal oversolicitousness moderated the association between preschool‐ assessed reticence and maternally assessed child social wariness at age seven years. When mothers were observed to be highly solicitous during a free‐play situation, preschool children’s social reticence predicted shy, anxious behavior at age seven years. However, when mothers were observed to be low on solicitous behavior, children’s social wariness tended to dissipate (Degnan et al., 2008).

Similarly, in a related study, it was revealed that observed reticent behavior at four years predicted observed reticence at age seven years, but only for children whose mothers were observed to display negative affect and control during free play and clean‐up sessions *at age seven years* (Hane et al., 2008). And in a study in which chil- dren identified as having *stable* BI/reticence status from infancy to seven years, observed maternal overcontrol at seven years moderated the relations between BI and adolescent (14–17 years) self‐ and parent‐reports of social anxiety (Lewis‐Morrarty et al., 2012). Taken together, the path that we forged in the *Waterloo Toddler Study* resulted in a plethora of studies that have revealed, consistently, that parental behavior moderates the relation between dispositionally based BI in early childhood and displays of socially wary and anxious behavior in subsequent years (for a thorough review, refer to Hastings et al., 2019).

*Additional findings.* The *Waterloo Toddler Project* produced numerous rewarding findings in addition to those highlighted above. For one, we were interested in the questions of “who leads the dance – parents or their children?” Thus, in a cross‐lagged panel analysis in which we examined identical constructs at ages two and four years, we discovered that for *both* mothers and fathers, parental reports of shyness and parental lack of encouragement of independence were stable. Furthermore, *perceptions* of their toddlers’ social wariness and shyness predicted, at child age four years, parental preference for socialization strategies that could best be construed as limiting children’s opportunities for developing an independent self. Thus, parents who viewed their toddlers as shy and inhibited were *less likely* than those who did not perceive their children as shy, to endorse statements such as the following: “I let my child make decisions for himself/herself ”; “If my child gets into trouble, I expect her or him to handle the problem mostly by herself/himself ”. However, although shyness at age two years predicted parental lack of encouragement of independence at child age four years, *the reverse was not the case* (Rubin et al., 1999).

In a second study, we examined the longitudinal relations between cardiac vagal tone and childrearing practices over the two‐year toddler project (Kennedy et al., 2004). According to Porges (1991), cardiac vagal tone, because of its influences on parasympathetic functioning, is an assessment of the physiological regu- lation of arousal. Typically, cardiac vagal tone is assessed via the measurement of respiratory sinus arrhyth- mia (*RSA*) (Berntson et al., 1997). *Baseline* measures of *RSA* reflect the efferent vagal projections to the heart *at rest* – or an individual’s potential to engage the “vagal brake” and the ability to return the body to homeostasis after sympathetic arousal. Thus, resting RSA may reflect individual differences in the ability to regulate arousal. For example, in one of our studies, we reported that both observed BI and maternally

reported temperamental shyness loaded significantly on the same factor as baseline RSA (with a negative load- ing of the latter) at both two and four years of age with the same sample of children (Hastings et al., 2004).

We found that (1) RSA was stable from the toddler to preschool years; and (2) mothers’ parenting practices were consistent over time from the toddler to preschool years; (3) *lower* cardiac vagal tone, an index of emotion dysregulation and a correlate of social wariness and BI (Hastings et al., 2005; Rubin et al., 1997), predicted maternal engagement of harsh, restrictive parenting practices; conversely, *higher* cardiac vagal tone, an index of emotion regulation, predicted more supportive parenting by mothers; and (4) not only did cardiac vagal tone predict parental behavior, it also served to moderate the relation between parenting styles at child ages two and four years. Thus, restrictive parenting was stable in very early childhood, but only for those children who were highly or modestly emotionally dysregulated.

Our findings made sense to us given that parents may choose to be restrictive if they believe their emo- tionally fearful and dysregulated children are at psychological or physical risk should they be left to make decisions on their own. Thus, to the extent that the children with low vagal tone are actually behaviorally inhibited (Rubin et al., 1997), the constraints imposed by restrictive parents may deny these children the necessary challenging experiences to develop their self‐regulatory abilities. Parents’ child‐rearing orienta- tions may serve to maintain or exacerbate the nascent wariness and emotional dysregulation in their children.

In a related study (Root et al., 2016), we investigated *maternal* physiological regulation as a moderator of the relations between *mothers’* characteristics of shyness‐anxiety and their engagement in supportive parenting, restrictive parenting, and overprotective parenting. We found that shy‐anxious *mothers* were more overprotec- tive and tended to be less supportive of their preschool‐aged children. Importantly, the relation between social anxiety and overprotection was tempered by *maternal* baseline RSA; it was only when mothers had relatively weak parasympathetic regulation of arousal that maternal shyness‐anxiety predicted overprotective parenting. Conversely, maternal shyness‐anxiety was not related to overprotection when mothers had more robust para- sympathetic regulatory capacity; mothers with higher RSA displayed average levels of overprotection, regard- less of their shyness‐anxiety. Thus, those mothers who are shy‐anxious and emotionally dysregulated appear to be most likely to engage in intrusive parenting.

Finally, in a recently published paper based on the *Waterloo Toddler Project* data, we examined how and whether both behaviorally manifested and physiological indices of emotion regulation moderate the relation between toddler BI and preschoolers’ social reticence (Smith et al., 2019). The findings indicated that BI during the toddler period places children at heightened risk if they remain *both* physiologically dysregulated and are unable to *behaviorally* regulate initial responses to negative emotion; BI only positively predicted preschoolers’ social reticence with unfamiliar peers when baseline RSA was low and negative emotionality (as assessed by mothers) was high.

Significantly, this finding implies that one promising intervention strategy for preventing social reticence, social withdrawal, and their accompanying negative social and emotional consequences would involve pro- moting BI children’s ability to regulate emotion effectively. And this is precisely what we are now attempting to do in an ongoing intervention for preschool age children who have been identified, on the basis of being highly inhibited, as at risk for the development of anxiety disorders (e.g., Chronis‐Tuscano et al., 2015). Given that both low negative emotionality and physiological regulation buffer BI children against later reticence and withdrawal, improving children’s ability to regulate initial emotional responses may serve as a particularly efficient target for intervention.

*Summary.* The *Waterloo Toddler Project* began in the early 1990s and still continues to bear relevant fruit. Our findings pertaining to continuities of BI, and the roles played by biological and socialization factors in the development of anxiously withdrawn reticent behavior have set the stage for a transition from basic research to “translation.” Thus, we are now attempting to demonstrate that both social skills and emotion regulation training *in the peer group* plus parent–child interaction therapy (PCIT) can be used, together, to decrease BI, not only in the lab, but also as observed “in the wild.” Without our initial findings pertaining to the roles played by

maternal overcontrol and biological markers of emotion dysregulation in the development of socially anxious, shy/withdrawn behavior, we would not have had the “starting points” for the development of what is now known as the “Turtle Project” (see Chronis‐Tuscano et al., 2018 for a description).

### Snmmary and Conclnsions

The initial purpose of this chapter was to describe the theories and constructs that have guided the develop- ment of one of the first *programs* of research on the topic of social withdrawal. It is an undeniable truth that during the course of the research program described herein, several other researchers began to study the pre- dictors, concomitants, and consequences of social withdrawal and related constructs (e.g., Caspi et al., 1988; Gazelle & Rudolph, 2004; Ladd & Burgess, 1999; Moskowitz et al., 1985; Sanson et al., 1996). Indeed, many of these studies are described elsewhere in this *Handbook* (see chapters in this volume by Bowker, Cheah, Chen, Ladd, and Klein). However, unlike these other researchers and their studies, the *Waterloo Longitudinal Project* was guided by a theoretical framework and an existing data base that was *not* focused on children’s solitude shyness, or BI. Rather, the conceptual origins derived from theoretical writings and empirical work that stressed the significance of: (1) peer interaction; and (2) exploration of the social environment. Both peer interaction and exploration of the social environment were posited to bring about the development of social cognitive prowess, social competence and interpersonal problem‐solving, the self‐system, and the predilection to engage in play. Given established links between these original theoretical assumptions and the research that supported these conceptual leanings, the program of research described in this chapter derived plainly from a process that can best be described as “conceptual flipping.” That is, the *Waterloo Longitudinal Project* was a consequence of asking such questions as: “What might happen if children *failed* to interact, converse, negotiate, and resolve differences of opinion with peers?” What would happen if children *failed* to explore novelty in their social worlds? I would surmise that no other existing body of research *on the topic of social withdrawal* was evoked by the same theories and the “flipping” questions.

By asking questions that derived from theory and from the initial results of the *Waterloo Longitudinal Project*, my colleagues and I began to explore additional theories and constructs pertaining to the origins, concomi- tants, and consequences of social withdrawal. For example, we became aware that children lived with parents who have beliefs about how they could or should act in order to meet their parenting goals. And these parent- ing cognitions predicted their behaviors, *and*, those behaviors helped create qualitative differences in the ways that parents interacted with their children. We also became aware of the significance of dispositional traits and the biological concomitants of those traits.

Further, to address the questions raised in our ever evolving research program, we had to generate novel taxonomies to study the constructs of interest . . . taxonomies that are now used by researchers who share our excitement for pursuing interesting and important research questions about the construct of social withdrawal in its many forms. From a personal perspective, it was the writings and research of Hinde (e.g., 1987) that guided our emphasis on studying phenomena that we could *see* – throughout our research program, we have stressed the significance of *observing* our participants and in predicting that which can be observed from mean- ingful data that derive from self‐ and significant other‐reports as well as from biological assays.

It merits noting that our work on the topic of social withdrawal did not end in 1995, when I left the University of Waterloo. Beginning in 1999, I received 11 years of funding from the NIH to explore the roles played by parents, close friendships, and the peer group at large as children made transitions from elementary to middle school to high school and beyond. For readers who are interested in following socially withdrawn (as well as aggressive and typical) children as they move into adolescence, our work is described in a variety of sources (for reviews, see Rubin, Barstead et al., 2018; Rubin, Bowker et al., 2018).

The Waterloo findings, and those gleaned from our work at the University of Maryland eventually placed us in an enviable position to bring our work into the field of translational science. For the past nine years, we have been examining how the transactional, conceptual model that has directed our basic research on the development of social withdrawal can be used to develop an intervention research program that has focused on young children

who we believe are at considerable risk for the development of anxiety (and more specifically, social anxiety; Barstead et al., 2018; Chronis‐Tuscano et al., 2015; Danko et al., 2018). The conceptual model that has guided our program of research was first published in 1988 (Rubin & Lollis, 1988) and most recently in 2009 (Rubin et al., 2009); a description of the model can be found in Figure 29.1. In many ways, the “real‐life” significance of this model and our research program is illustrated in the following letter that I received after an interview I had given was published in a Toronto newspaper in the early 1990s (I have inserted the *italics*):

“Dear Dr. Rubin,

I am a former elementary school teacher and I am very aware of the importance of a child’s readiness in all areas – *social* as well as academic, physical, and *emotional*.

*My daughter and I have never been close*. She was one who as a baby would stop crying when I set her on the floor instead of cuddling her. I gave up my career to do special things with her and we oftentimes clash. *She prefers doing things alone* instead of playing cards with me or other game‐like involvement.

We had her repeat kindergarten *for social reasons only*. She would oftentimes say things like “*Susie isn’t nice to me*.” Last March on her own she told me she did not want to go to first grade. She is *very passive at school, does not want group attention*, *prefers to play alone but likes to watch others play (she looks like she wants to be a part of the group but doesn’t know how)*.

I feel that XXX was *born this way*. This is not because I don’t want to blame myself. *But this all started when she was a toddler*. She was very independent around both of us. My husband is a very close participating mem- ber of the family. I know this is hard for you to give any suggestions without knowing our family but we are very close knit and happy. We have real need to help our daughter XXX because *I feel it will get much worse for her* when she’s in school in the fall the whole day.

Thank you for your attention.”

In this one letter, one can identify key elements in our conceptual model and in the program of research described in this chapter. The mother describes issues pertaining to the child’s inborn traits, the quality of the parent–child relationship, the child’s reticence and wariness in school, the child’s lack of social compe- tence, and the mother’s anxiety about what the future may bring. I have received literally hundreds of let- ters from parents who describe similar concerns as well as from adults who retrospectively recall the pain of being a withdrawn, rejected, lonely child or adolescent. Indeed, I could have filled this chapter with such letters instead of having written this lengthy autobiographical description of a research program. The let- ter is a simple reminder of what you have just read; and it remains a personal reminder of why my career is ending with an attempt to prevent and intervene in the lives of children who are at high risk for the development of such negative outcomes as anxiety, loneliness, and difficulty in making and retaining affec- tively and behaviorally supportive relationships. I leave it to the next generation of researchers and practi- tioners to take the information given and do what you can to remove children and adolescents from the developmental pathway that I described in the text, the conceptual model, and in the letter that brought this chapter to an end.