

HANDBOOK OF **EMOTION** REGULATION

THIRD EDITION

edited by

JAMES J. GROSS
BRETT Q. FORD



GUILFORD PRESS
— e-book —

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THE GUILFORD PRESS
New York London

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A Division of Guilford Publications, Inc.
370 Seventh Avenue, Suite 1200, New York, NY 10001
www.guilford.com

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Printed in the United States of America

This book is printed on acid-free paper.

Last digit is print number: 9 8 7 6 5 4 3 2 1

Library of Congress Cataloging-in-Publication data is available from the publisher.

ISBN 978-1-4625-4941-2 (paperback)
ISBN 978-1-4625-5303-7 (cloth)

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To Mary and Maureen

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Preface

The field of emotion regulation is thriving. Discussions of emotion regulation seem to be everywhere—they appear in popular and academic books, articles, conferences, journalism, and social media. This high (and growing) level of interest in emotion regulation is reflected in scholarly citation trends. Until the early 1990s, there were just a few citations each year containing the phrase “emotion regulation.” By 2007—the year in which the first edition of this handbook was published—there were more than 3,000 Google Scholar citations for that year alone. By 2014—the year in which the second edition of this handbook was published—there were more than 15,000 Google Scholar citations for that year alone. In 2022, the citation count surpassed 30,000 for that year alone. Total citations for emotion regulation currently stand at over 750,000, and the growth of this area shows no sign of slowing—hence, this third edition of the *Handbook of Emotion Regulation*.

The rapid growth of this field is a cause for celebration. It is also a cause for consternation, as it is all but impossible for any one person to see the field in its totality. The goal of this edition of the *Handbook* is to provide an authoritative and up-to-date account of findings in this field that will (1) encourage cumulative science by drawing together the latest findings from the myriad literatures relevant to emotion regulation; (2) help educators, managers, and health care professionals who regularly face emotion regulation challenges in school, work, and therapeutic contexts; and (3) facilitate cross-disciplinary dialogue about one of the most fascinating puzzles regarding the human condition—namely, that we are at once governed by, and governors of, our emotions. All 71 chapters in the *Handbook* are brand new for this edition, and all chapters now have a brief format that we think may be ideal both for affective scientists active in this field and for students encountering the field for the first time.

Although this handbook is divided into 14 sections, one of its main goals is breaking down barriers to cross-area communication. For this reason, there are considerably more cross-chapter links and citations than is typical in a handbook of this kind. There are

also many points at which an author in one section presents material that makes contact with ideas, methods, and evidence from another section (e.g., social psychology in the cognitive section, neuroscience in the developmental section, clinical psychology in the individual differences section, cultural psychology in a number of the sections). Our hope is that these carefully assembled chapters—which are written by leading scholars in the field, who have worked hard to make findings accessible—will bring the field of emotion regulation together in a way that is productive and new.

The *Handbook* begins with conceptual and methodological foundations. Section I opens with Gross's conceptual overview of the field. This is followed by Stanoi and Ochsner's overview of experimental methods, and Willroth and John's chapter on individual difference methods. Highlighting the dynamic and iterative nature of emotion regulation, we next feature a chapter from Koval and Kalokerinos reviewing the use of daily diaries and ecological momentary assessment, and a chapter from Butler reviewing time-series and dynamical systems.

Section II describes the biological bases of emotion regulation. Its first chapter, by Urry, details the somatic and autonomic effects of emotion regulation. Bo and Wager review core functional magnetic resonance imaging findings, and then Weinberg and Park review core electroencephalogram findings. In this section's final chapter, Levenson reviews neuropsychological findings, providing insights from patients with brain damage.

Section III considers cognitive approaches to emotion regulation. It begins with Evans and Crum's chapter on mindsets and Sheppes's chapter on emotion regulation choice. These chapters are followed by Suri's chapter on affordances, and Guevarra, Kross, and Moser's chapter on placebo effects.

Section IV is focused on developmental considerations. It opens with Tottenham's chapter on the neurobiology tied to emotion regulation during early development. This is followed by Spinrad and Eisenberg's chapter on the socialization of emotion regulation within the family. The next two chapters focus on key life periods: Riediger considers emotion regulation in adolescence, and Charles and Carstensen consider emotion regulation in older age.

Section V takes up interpersonal aspects of emotion regulation. Its first chapter, by Niven, provides an overview of interpersonal emotion regulation. Mikulincer and Shaver then consider attachment, followed by Meier, Stephens, and Haase's chapter on romantic relationships. This section concludes with Mikolajczak and Roskam's chapter on emotion regulation and parenting.

Section VI examines emotion regulation in groups and collectives. Goldenberg opens this section with a chapter on group-based emotion regulation. Green, Duker, and Richeson then examine emotion regulation and discrimination. This is followed by Trujillo's chapter on coping with stigma, Halperin and Avichail's chapter on conflict resolution, and Destin and Haase's chapter on socioeconomic status. The section concludes with Mesquita and Schouten's chapter on culture and emotion regulation.

Section VII explores individual differences in emotion regulation. The first chapter in this section, by Brackett and Divecha, considers emotional intelligence. The next, by Preece and Sikka, considers alexithymia, followed by a chapter on valence bias by Neta. Duckworth and Gross then offer a perspective on self-control. This is followed by Tamir and Hu's consideration of emotion goals. In the last two chapters, Kalokerinos and Koval consider variability and flexibility in emotion regulation, and Mauss and Troy offer an emotion regulation perspective on resilience.

Section VIII takes up general considerations regarding psychopathology. First, Cludius and Ehring consider emotion regulation's status as a transdiagnostic risk factor.

Then Millgram examines the role of emotion goals in mental health, followed by Tan, Wachsmuth, and Tugade, who review the role of positive emotion in mental health, and Rottenberg, Goodman, and Kashdan, who examine well-being after psychopathology. Ford then considers the costs of striving to feel good. In the last chapter, Chentsova Dutton, Tuna, and Tamir provide an overview of culture and mental health.

Section IX is concerned with emotion regulation in the context of specific mental disorders. Aldao's chapter on anxiety disorders opens this section. This is followed by Rutherford and Joormann's chapter on depressive disorders, and Villanueva, Swerdlow, and Gruber's chapter on bipolar disorder. Roos and Kober provide a chapter on emotion regulation and substance use disorders, Cai and Samson consider autism spectrum disorder, and Kimhy and Ospina review the role of emotion regulation in schizophrenia. In the last chapter, Fitzpatrick and Dixon-Gordon consider emotion regulation in personality disorders, with particular attention to borderline personality disorder.

Section X focuses on interventions in clinical settings. The section opens with Mennin and Fresco's chapter on emotion regulation therapy, followed by Berking and Musa's chapter on affect regulation training. There is then a chapter by Kuo on dialectical behavior therapy and a chapter by Shallcross and Hill on mindfulness interventions.

Section XI concerns interventions outside the clinic. The first two chapters consider different intervention targets: Grafton and MacLeod discuss attention modification and Moskowitz considers positive emotion regulation. The next two chapters explore treatment modalities: Schleider provides a discussion of single-session interventions, followed by Niles's chapter on digital mental health interventions. The last two chapters consider specific intervention recipients: England-Mason considers parenting interventions and Hoffmann and De France provide an overview of teaching emotion regulation in schools.

Section XII assesses links between emotion regulation and physical health. The opening chapter, by Trudel-Fitzgerald, Guimond, and Kubzansky, focuses on cardiovascular disease. The next chapter, by Alfano, Myers, and Rech, takes up the issue of sleep. The last chapter, by Miyamoto and Coe, examines culture and health.

Section XIII examines specific emotion regulation processes that have each garnered substantial empirical literatures. First, Uusberg and Uusberg examine reappraisal. Then, English focuses on expressive suppression. Kross and Ayduk focus on distancing, followed by Watkins, who discusses rumination. Finally, Rimé reviews social sharing.

Section XIV considers emotion regulation across disciplines. The first chapter, by Maroney, discusses emotion regulation and the law. The second, by Harley and Pekrun, reviews the role of emotion regulation in education. The third, by Tamminen and Kim, considers emotion regulation in sport. The fourth, by Seligman, assesses the role of emotion regulation in anthropology, then the fifth, by Lively, turns to sociology. The last chapter, by McRae and Goldstein, examines emotion regulation in the arts.

Taken together, these chapters represent a comprehensive overview of some of the most exciting contemporary work in the ever-expanding field of emotion regulation. While we have done our best to provide broad coverage of this field, we acknowledge that a truly exhaustive account is not possible given the dizzying growth of the field.

A large number of wonderful people helped to bring this handbook into being. We are particularly grateful to Seymour Weingarten, Editor-at-Large at The Guilford Press, for enthusiastically supporting this effort. We are also grateful to our many friends, colleagues, and students who have helped shape our thinking about emotion regulation.

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SECTION I

FOUNDATIONS

CHAPTER 1

Conceptual Foundations of Emotion Regulation

JAMES J. GROSS

The idea that emotions are sometimes helpful and sometimes unhelpful is a very old one (Solomon, 1976). So too is the idea that when emotions are unhelpful, we can take steps to alter them (Epictetus, 2004). Until the early 1990s, however, there was relatively little empirical work on emotion regulation. Now there are tens of thousands of new publications each year. In this chapter, I review the conceptual foundations of the field of emotion regulation, beginning with one of the toughest questions in affective science—namely: What *is* an emotion?

Emotion and Related Processes

The term *emotion* refers to a diverse array of phenomena (Suri & Gross, 2022). Some are subtle (a twinge of guilt), others are intense (a pee-in-your-pants bout of amusement). Some are brief (a flicker of anxiety), others are extended (a spell of sadness). Some are relatively simple (disgust upon discovering an unidentified decomposing object in the back of the fridge), others are complex (the multivalent wash of emotions one sometimes gets during important life transitions). Some are private (a pang of regret at a missed opportunity), others are public (embarrassment at a highly visible faux pas). What—if anything—unites these diverse instances of emotion?

Core Features of Emotion

Emotions arise during person–situation transactions that have particular meaning to the individual in light of currently active goals (Moors, 2017). They involve coordinated yet flexible multisystem responses that often change the ongoing person–situation transaction. Drawing upon cybernetic theory, emotions may be viewed as arising through a series of iterative cycles comprising four elements (Gross, 2015). These include (1) a *situation*

that can be experienced or imagined; (2) *attention* that determines which aspects of the situation are perceived; (3) *evaluation* or *appraisal* of the situation in light of currently active goals; and (4) a *response* to the situation, including changes in experience, physiology, and/or facial or whole-body behavior (see Figure 1.1).

To make this more concrete, consider how anxiety may arise when a person goes for a job interview (situation); pays attention to the frowning interviewer (attention); appraises the situation as threatening (evaluation); and feels anxious, sweats, and wants to flee (response). Emotional responses generated during one iteration of this cycle may become part of the situation that gives rise to a subsequent iteration. Thus, the person being interviewed may feel their heart racing (situation), focus on how anxious they feel (attention), appraise the situation as even more threatening (evaluation), and experience even stronger anxiety (response). Successive iterations of the emotion-generation loop may produce successively more powerful shifts in attention, evaluation, and response.

Emotions and Other Affective Processes

Many terms are used to refer to emotion-related processes, including *affect*, *emotion*, *stress*, *mood*, and *impulse* (Gross & Thompson, 2007). Unfortunately, the wildly divergent meanings attached to these terms have created “conceptual and definitional chaos” (Buck, 1990, p. 330). To organize this chaotic landscape, it’s useful to view *affect* as the umbrella term for states that involve relatively quick good-for-me/bad-for-me discriminations. These affective states include (1) *emotions*, such as anger and happiness; (2) *stress responses* in situations that exceed an individual’s ability to cope; (3) *moods*, such as depression and euphoria; and (4) *impulses* that can be broadly categorized as either appetitive or defensive (see Figure 1.2).

How are these various affective processes distinguished? While both stress and emotion involve whole-body responses to meaningful events, stress generally refers to stereotyped responses to negative situations, whereas emotion refers to more specific responses to negative and positive situations. Emotions also may be distinguished from moods. Moods often last longer than emotions, and compared to moods, emotions are typically elicited by specific objects and give rise to response tendencies related to these objects. By

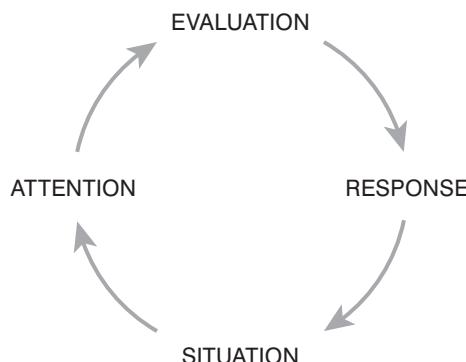


FIGURE 1.1. Emotions involve (1) a *situation* that can be experienced or imagined; (2) *attention* that influences which aspects of a situation are perceived; (3) an *evaluation* or *appraisal* of the situation in light of currently active goals; and (4) a *response* to the situation that can entail changes in subjective experience, physiology, and/or facial or whole-body behavior. Frequently, emotional responses alter the person–situation transaction that initially gave rise to emotion.

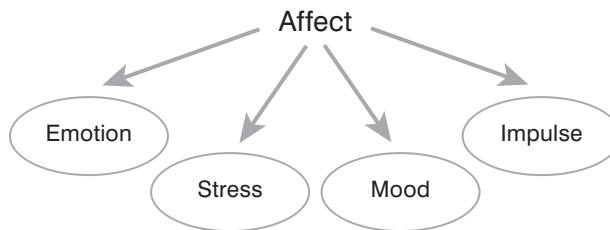


FIGURE 1.2. *Affect* is an umbrella term for states that involve relatively quick good-for-me/bad-for-me discriminations. These include (1) *emotions*, such as anger and sadness; (2) *stress responses* in situations that exceed an individual's ability to cope; (3) *moods*, such as depression and euphoria; and (4) *impulses* that can be broadly categorized as either appetitive or defensive.

contrast, moods are more diffuse, and although they may give rise to broad action tendencies such as approach or withdrawal, they typically bias cognition more than they bias action. Impulses are perhaps the least well-defined of these affective terms, but they can be differentiated in terms of their antecedents and consequences (Uusberg et al., 2019). Clarity regarding how each of these constructs is being used in a given research context is a prerequisite for an analysis of how these various processes are regulated (Gross, 2010).

Emotion Regulation and Related Processes

One of the fundamental insights in affective science is that affective responses are (to some degree) amenable to regulation. My focus here is one type of affect regulation—namely, *emotion regulation*—which refers to efforts to influence which emotions one has, when one has them, and how one experiences or expresses these emotions (Gross, 1998). Examples include leaving work early when you're too upset to function, calling your mother when you're sad, meditating after a hectic week, going to a movie to have a laugh with a friend, and thinking about all the ways a tough situation could be worse. Because there seems to be no limit to the activities that might qualify as emotion regulatory, what is needed—as with emotion—is a description of what unites these diverse instances.

Core Features of Emotion Regulation

There are many different views as to how (and whether) emotion reactivity and emotion regulation should be distinguished (Gross & Barrett, 2011). From my perspective, emotion regulation occurs when (1) an emotion is evaluated as good or bad, and (2) this evaluation activates a goal to change the emotion (Gross et al., 2011). One way of conceptualizing emotion regulation is in terms of a functional coupling of two *valuation systems*. On this view, a first-level valuation system that is instantiating emotion (see Figure 1.1) becomes the object of a second-level valuation system that takes the emotion as its object (Gross, 2015; see Figure 1.3).

Importantly, the first-level valuation system that one is targeting for regulation may be either in oneself (*self-focused emotion regulation*: Anne regulates Anne's emotions; see Figure 1.4) or in someone else (*other-focused emotion regulation*: Anne regulates Paul's emotions; see Figure 1.5). It is worth noting that the distinction between self-focused and other-focused regulation has sometimes been referred to as the distinction between *intrinsic* and *extrinsic* regulation (e.g., Gross, 2015; Zaki & Williams, 2013)—however,

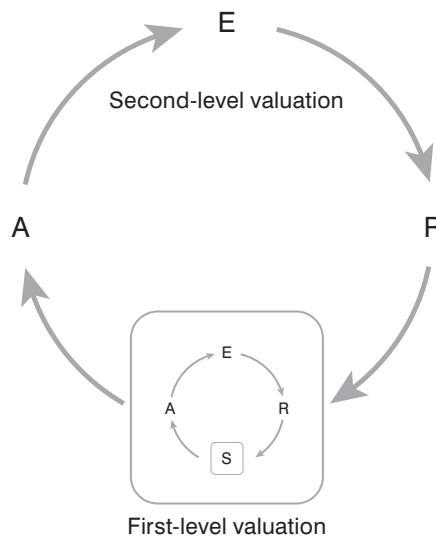


FIGURE 1.3. Emotion regulation involves the functional coupling of two *valuation systems*, in which a first-level valuation system that is instantiating emotion (see Figure 1.1) becomes the object of a second-level valuation system that takes the emotion as its object (Gross, 2015). S, situation; A, attention; E, evaluation; R, response.

the self-focused and other-focused terminology has the advantage that it helps avoid potential confusion with motivational meanings of the terms *intrinsic* and *extrinsic* (Petrova & Gross, in press).

Both self-focused and other-focused emotion regulation goals can be attained through either *nonsocial* or *social* means. Nonsocial means refer to using only one's own resources, whereas social means refer to using at least one other person's resources (Petrova & Gross, in press). If we jointly consider self-focused and other-focused goals, as well as nonsocial and social means, we get four possible pairings of goals and means.

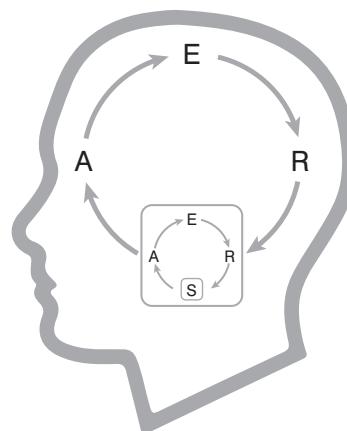


FIGURE 1.4. *Self-focused emotion regulation*, in which both of the valuation systems that define emotion regulation are active within a single person.

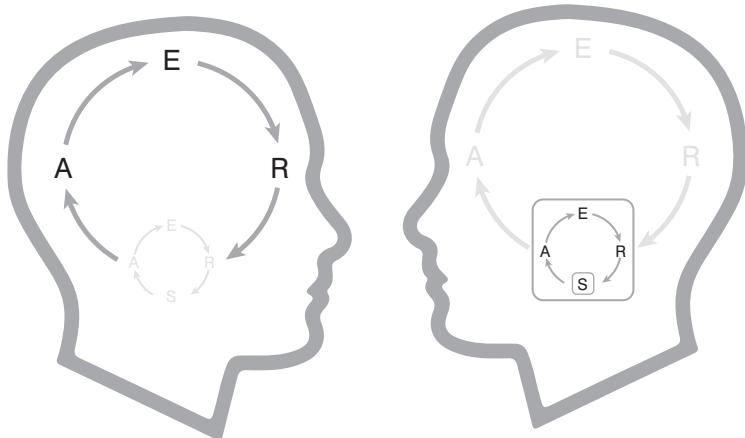


FIGURE 1.5. *Other-focused emotion regulation*, in which one of the two valuation systems that define emotion regulation is active in one person (left figure, in which the second-level valuation system is active) and the other valuation system is active in another person (right figure, in which the first-level valuation system is active). In this dyad, the left figure activates the goal to modify the right figure's emotion.

Thus, (1) Anne may regulate Anne's emotions using just her own resources (self-focused nonsocial), (2) Anne may regulate Paul's emotions using just her own resources (other-focused nonsocial), (3) Anne may regulate Anne's emotions using Paul's help (self-focused social), and (4) Anne may regulate Paul's emotions by helping Paul use his own regulatory resources or by recruiting Mark's help (other-focused social). In what follows, my primary focus is self-focused nonsocial emotion regulation, although much of what I say also applies to the other three cells described here.

One widely used framework for studying emotion regulation is the *process model of emotion regulation* (Gross, 1998, 2015). This framework describes four stages that undergird emotion regulation: identification, selection, implementation, and monitoring (see Figure 1.6). Each stage is linked to a decision that the person makes, consciously or not (Braunstein et al., 2017; Koole et al., 2015; Gross et al., 2019).

In the *identification* stage, a person decides whether a given emotional state should be changed to better approximate a desired emotional state (the emotion goal). Desired emotional states are often ones that feel pleasant, but they can also be ones that are useful in some other way (Tamir, 2016). For instance, a person might wish to be angrier than they currently are because they believe this will help them to negotiate a better deal for themselves, or to fight more vigorously for a cause they believe in.

A decision to change an emotional state triggers the *selection* stage, when the person decides where to intervene in the emotion-generative process. Five families of emotion regulation strategies may be distinguished based on where they have their primary impact on emotion generation (see Figure 1.7). *Situational strategies* seek to alter emotion by selecting which situations are encountered (*situation selection*) or modifying what is going on in them (*situation modification*). *Attentional strategies* seek to alter emotion by changing what aspects of the situation are attended to. *Cognitive strategies* seek to alter emotion by modifying how the situation or one's goals are cognitively represented. Finally, *response modulation strategies* seek to alter emotions by directly modifying emotion-related experiential, behavioral, or physiological responses. Because each strategy has different costs and benefits that vary by context, strategy selection involves

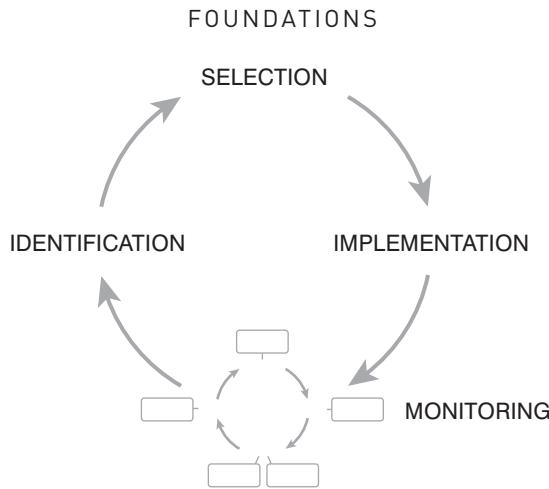


FIGURE 1.6. According to the process model of emotion regulation, four stages define emotion regulation. The first three of these correspond to the second-level valuation steps of attention, evaluation, and response. The fourth is the monitoring stage. For details of the first-level valuation system depicted here, see Figure 1.7.

a matching process. For example, where an upsetting situation can be improved, it may be best to change the situation rather than to use cognitive strategies. By contrast, in a context where little can be done to improve the situation, it may be best to use cognitive rather than situational strategies (Troy et al., 2013).

Strategy selection triggers the *implementation* stage, during which the person decides which specific actions to take. This stage is needed because the broad strategies that aim

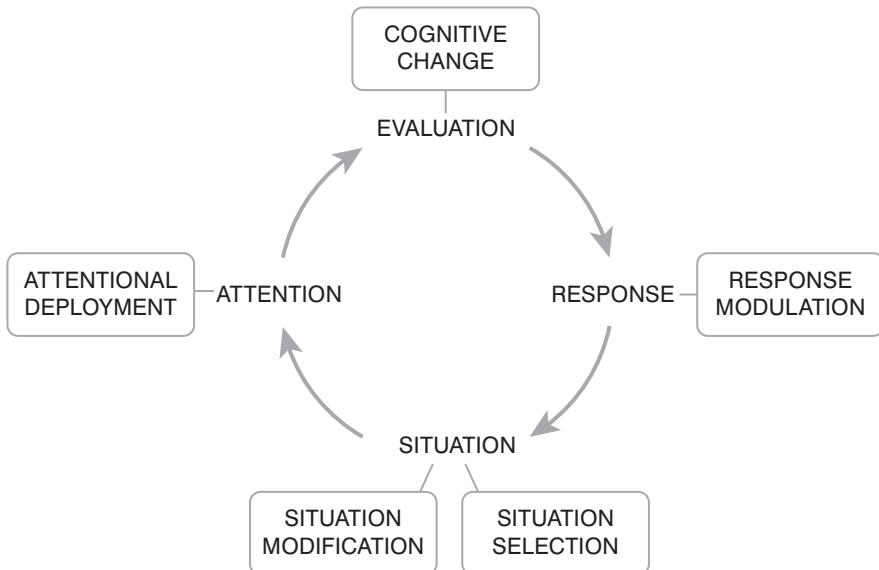


FIGURE 1.7. Five families of emotion regulation strategies may be distinguished based on where they have their primary impact on emotion generation. These strategies are given placeholders in Figure 1.6, and drawn out here.

to alter one or more of the steps in the emotion-generative process that were outlined above can be enacted in different ways. These are referred to as *regulation tactics*. The implementation stage is where the regulation process impacts the emotion by translating a general regulation strategy (e.g., cognitive change) into specific mental or physical actions (e.g., thinking that someone who bumped into me wasn't trying to hurt me, but instead had tripped).

The identification, selection, and implementation decisions form an iterative cycle. As the situation evolves over time, each of these decisions may need updating. This updating process can be viewed as a separate *monitoring* stage, involving a decision to maintain, switch, or stop the regulation attempt. As long as the regulation attempt continues to produce the desired results, the person can *Maintain* regulation by relying on the existing identification, selection, and implementation decisions—however, if emotion doesn't change, or changes in undesirable ways, the chosen selection and/or implementation decisions can be *switched*, or the regulation attempt can be *stopped* altogether. Switching or stopping may also be necessitated by a change in context, which provides a new set of affordances or barriers to regulation. In practice, people frequently engage in multiple forms of emotion regulation, either concurrently or in quick succession, which is referred to as *Polyregulation* (Ford et al., 2019).

Emotion Regulation and Related Constructs

Paralleling the distinctions made in the emotion section above, emotion regulation can be seen as a special case of the broader category of *affect regulation*. All sorts of efforts to influence our valenced responses fall under this broad heading, including (1) *emotion regulation*, (2) *coping*, (3) *mood regulation*, and (4) *impulse regulation* (Gross & Thompson, 2007). Because so much goal-directed behavior can be construed as maximizing pleasure or minimizing pain—and thus as affect regulatory in a broad sense—it can be useful to sharpen the focus by examining one or more of these specific processes (see Figure 1.8).

Coping can be distinguished from emotion regulation both by its principal focus on decreasing negative affect, and by its emphasis on longer time periods (e.g., coping with a spouse with a debilitating chronic illness). As noted above, moods are typically of longer duration than emotions, and are less likely to involve responses to specific “objects.” In part due to their less well-defined behavioral response tendencies, compared to emotion regulation, mood regulation is typically more concerned with altering emotion experience than emotion behavior. Impulse regulation refers broadly to the regulation of

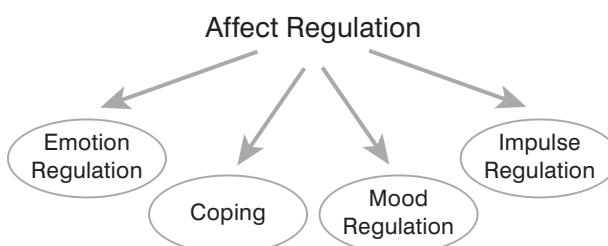


FIGURE 1.8. *Affect regulation* is an umbrella term for processes that regulate affect, including the four affective processes shown in Figure 1.2. As shown here, affect regulation includes (1) emotion regulation, (2) coping, (3) mood regulation, and (4) impulse regulation.

appetitive and defensive impulses, and one form of impulse regulation that has attracted particular attention is self-control (Duckworth et al., 2016). While the distinctions I have drawn here can be helpful in orienting to relevant literatures, there is growing evidence that affect regulation processes may share a number of features despite the differences in their regulatory targets (see Gross et al., 2019, for an integrative affective regulation perspective).

Emotion Regulation and Mental Health

A major focus in the emotion regulation field has been using our understanding of basic emotion-regulatory processes to improve mental health. Mental health is defined by (1) the absence of mental illness (including mental disorders and subclinical levels of negative affect; American Psychiatric Association, 2013) and (2) the presence of well-being (including emotional, cognitive, and social well-being; Keyes, 2005). Distinctions among emotion-generative and emotion-regulatory processes—and related distinctions among other forms of affect and affect regulation—are useful for understanding ill-being and well-being and developing interventions to improve mental health.

Emotion, Emotion Regulation, and Mental Health

It is frequently said that mental health requires adaptive emotion regulation (Fernandez et al., 2016); however, there are many sources of ill-being and well-being, and this oft-repeated claim needs unpacking. In particular, much remains to be done to specify exactly how ill-being and (lack of) well-being relate to problematic patterns of emotion intensity, duration, frequency, or type (Gross & Jazaieri, 2014). It's also important to note that emotion problems (and other affective problems) may be due to problems with emotion generation (e.g., temperamental differences in the activation of emotion), as well as problems with emotion regulation.

Emotion dysregulation is an umbrella term that includes three ways in which emotion regulation may go awry: *emotion regulation failure* (i.e., failing to regulate when it would be helpful to do so), *emotion misregulation* (i.e., regulating in a way that isn't well matched to the situation), and *emotion regulation misexecution* (i.e., using an appropriate strategy but failing to execute effectively). Using the process model of emotion regulation, it is possible to analyze each of these types of emotion dysregulation, drawing on work that specifies the costs and benefits of different forms of emotion regulation (Gross, 2013; Sheppes et al., 2015).

A more comprehensive analysis requires a number of further distinctions (and associated advances in measurement), including those among *emotion regulation goals* (what emotion a person values), *emotion beliefs* (beliefs about the value and properties of emotion), *emotion regulation beliefs* (beliefs about emotion regulation strategies and tactics), *emotion regulation capability* (how well a person can regulate emotions when they want to), *emotion regulation frequency* (how a person typically regulates emotions), *emotion regulation self-efficacy* (how well a person believes they can regulate emotions when they want to), *emotion regulation flexibility* (the degree to which a person tailors their emotion regulation strategies and tactics to varying contexts), *emotion regulation effectiveness* (the degree to which an emotion regulation strategy or tactic has the intended impact), and *emotion regulation adaptiveness* (whether an emotion regulation strategy or tactic is beneficial, all things considered).

Emotion Regulation Interventions

To illustrate just how important it is to get the target of emotion regulation interventions right, consider the reasonable-sounding proposition that one crucial source of emotion dysregulation is a lack of emotion regulation capability. This idea has guided hundreds of intervention studies, which have sought to define deficits in emotion regulation ability in populations with mental health challenges, and to show that effective emotion regulation interventions ameliorate these deficits in emotion regulation ability. Interestingly, however, there is mounting evidence that across a wide range of populations—even those with significant mental health challenges—emotion regulation capability (how effectively a person can regulate an emotion when they are cued to do so) is largely indistinguishable from the general population when assessed under controlled laboratory conditions (Yoon & Rottenberg, 2020). This is not what most of us in the field expected, and it appears that other targets for emotion regulation interventions are needed (Gruber et al., 2023). For example, in one study, it was reappraisal self-efficacy that mediated the salutary effects of cognitive-behavioral therapy in the context of social anxiety disorder (Goldin et al., 2012).

Despite early missteps such as these, the growing emotion regulation literature now offers a wealth of information to guide emotion regulation interventions, which differ in their targets (see the distinctions drawn immediately above among beliefs, flexibility, etc.), goals (prevention vs. treatment), levels of analysis (individual vs. group/community), modalities (self-guided apps vs. in-person interactions), duration (single session vs. repeated), and scope (symptom or disorder specific vs. global and transdiagnostic). The sheer diversity of emotion regulation interventions that are now available or under development is breathtaking, and there seems every reason for optimism that (1) (some of) these interventions will improve mental health, and (2) by trying out different types of interventions in different populations, we will gain new insights into the mechanisms underlying emotion generation and regulation, as well as those underlying affect generation and regulation more generally.

ACKNOWLEDGMENTS

I would like to thank members of the Stanford Psychophysiology Laboratory for comments on a prior version of this chapter.

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CHAPTER 2

Research Methods in Emotion Regulation

EVOLVING QUESTIONS AND NEW APPROACHES

OVIDIA A. STANOI
KEVIN N. OCHSNER

How we cope with difficult emotions has long been of scientific interest, but it wasn't until the early 1990s that emotion regulation truly took flight as a specific research area. Since then, the field has grown exponentially. Initially, researchers studied the efficacy of specific regulation strategies in laboratory settings, but over time it became clear that emotion regulation is a multifaceted process that involves complex interactions between numerous personal, situational, and strategic factors. Today, the field has moved away from the goal of identifying adaptive versus maladaptive strategies and toward investigating regulation as a dynamic open-ended process (Bonanno & Burton, 2013; Doré et al., 2017). Critically, as the questions posed in experiments have evolved, so too have the methodological approaches used to address them.

With this in mind, our chapter has three parts. First, we highlight the broadening scope of questions asked in the field of emotion regulation, coming ever closer to finding the "holy grail" of emotion regulation work: the elusive ability to specify what strategy is most effective for a specific person in a specific situation. Second, we survey methodological developments that have helped address these evolving questions, with a special emphasis on the social context in which regulation takes place. Third and last, we highlight potential future directions for the methods used to study emotion regulation.

Evolving Questions: Person × Situation × Strategy Interactions Matter

The questions driving emotion regulation research have gradually evolved amid growing recognition that heterogeneity in data is the norm rather than the exception in both laboratory and naturalistic studies. Although not all humans respond the same way to an

external event, historically, researchers treated such heterogeneity as noise masking true effects that need to be uncovered (Bolger & Zee, 2019). This focus on main effects above interactions has created confusion, contributed to the replicability crisis, and diminished confidence in the field's potential to inform public policy in a meaningful way (Pashler & Wagenmakers, 2012).

Reacting to these limitations, the last decade has seen a “heterogeneity revolution” (Bryan et al., 2021) that challenges researchers to begin with the assumption that most effects *should* depend on the characteristics of the people and contexts in which they are studied. *If* we accept this premise, then our focus can change to understanding *how* effects vary across people and contexts instead of attempting to discover universal principles.

The question of heterogeneity is particularly important to the field of emotion regulation, where theoretical models have long acknowledged “the fallacy of uniform efficacy,” emphasizing that the outcomes of regulation are likely to depend on the individual and situation in which regulation takes place (Bonanno & Burton, 2013; Troy et al., 2017). A regulation strategy that works in one context might not in another. In the spirit of the “heterogeneity revolution,” our lab proposed a model framing emotion regulation as a person \times situation \times strategy interaction (Doré et al., 2016). We think of the ability to specify “for whom, and under what circumstances, will different strategies be most beneficial and why” as the “holy grail” of emotion regulation research.

New Approaches to Studying Person \times Situation \times Strategy Interactions

Evolving questions require evolving methods to address them. This section highlights studies incorporating new measures and methods to study emotion regulation as a person \times situation \times strategy interaction. While it is beyond the scope of this chapter to survey all person, situation, and strategy variables that are—or could be—investigated, Table 2.1 summarizes some common examples that can be measured and/or manipulated in a given study.

Studying the Self-Regulation of Emotion

The lion’s share of studies has focused on how individuals exert self-control over their own emotions, typically in lab-based behavioral studies, although field and functional imaging studies are becoming increasingly common. We consider each in turn.

Lab-Based Behavioral Studies

Lab paradigms have begun to pose new questions about the interaction of person, situation, and strategy variables. Critical to this evolution was the realization that by instructing participants when and with what strategy to regulate, lab studies had been missing a common and essential regulatory dilemma: the question of what strategy to choose given our current situation. Spurred by this insight, Sheppes et al. (2011) gave participants the choice to use reappraisal or distraction when responding to aversive stimuli of varying intensity. They found that reappraisal was preferred for low-intensity stimuli and distraction for high-intensity stimuli. This finding pushed the field to consider how the usefulness of any regulation strategy varies by the situation (Troy et al., 2013), and

TABLE 2.1. Examples of Person, Situation, and Strategy Variables Studied in Emotion Regulation Research

Person	× Situation	× Strategy
Cellular/molecular-level variables, including genetics, receptors, neurotransmitters, hormones	Kinds of emotion-eliciting stimuli	Manipulate or measure regulatory goals
Differences in life events, socialization, and learning histories, trauma, or stress exposure	Frequency of occurrence (e.g., isolated vs. recurrent)	Manipulate or measure strategies chosen
Structural/functional measure of the maturation and integrity of brain systems	Self versus social (e.g., alone vs. being in the presence of, touching, and/or interacting with one or more individuals)	Manipulate or measure timing of strategy implementation
Structural/functional measures of relevant physiological systems (e.g., hypothalamus–pituitary–adrenal axis; sympathetic/parasympathetic function)	If social, the relationship between self and others (e.g., close vs. distant)	Manipulate or measure frequency of strategy implementation, including practice and training
Whole-person descriptors, including age, personality traits, chronic behavioral/emotional tendencies, clinical diagnoses	If social, the behavioral context (e.g., support conversation, group interaction)	Measure downstream effects of strategy implementation on emotion, behavior, relationships, etc.

Note. This table lists examples of person, situation, and strategy variables that are being studied in current emotion regulation research. After an initial wave of studies primarily focusing on one variable type at a time (e.g., comparing the effects of using different types of strategies, how well clinical vs. control groups can use a specific strategy), more recent work has moved toward studying interactions among these variables (e.g., asking how different strategies are most appropriate for different situations). From a methods perspective, a key question is how to design studies that capture these interactions in a tractable and reliable way.

provided a means of defining new personal-level variables, such as regulatory flexibility, which indexes a person's tendency to switch between strategies (e.g., distraction vs. reappraisal) across situations. Armed with such new approaches, scientists can ask new questions and reexamine issues of long-standing interest. For example, Levy-Gigi et al. (2016) took a “person × situation” approach to studying resilience and showed that in firefighters, symptoms of posttraumatic stress disorder (PTSD) were more likely to emerge after trauma exposure for individuals low in regulatory flexibility. Beyond this work, various other person-level variables—and their interactions with situational and/or strategic variables—can and are being investigated. Some variables can also be derived from task performance, such as responsiveness to internal feedback (Birk & Bonanno, 2016), or studies might focus on demographics known to influence affective and cognitive development, such as age (Silvers et al., 2012) and socioeconomic status (Troy et al., 2017).

Field Research

Another heterogeneity-focused trend involves testing concepts and relationships established in laboratory experiments in ecologically valid field settings, where participants can freely choose strategies in response to different everyday situations. This allows researchers to ask *who* selects *what* strategies in *which* situations, and furthermore, to track the

impact these strategies have on the ebb and flow of emotions in everyday life (Blanke et al., 2022). The canonical paradigm for such studies is experience sampling or ecological momentary assessment (EMA), which typically uses smartphone-based queries to probe emotional experiences in the moment, thereby avoiding biases associated with memory recall (Barrett & Barrett, 2001). Surveys can be sent to participants' phones at fixed or varying intervals over very short (minutes) or longer periods of time (days), depending on the question of interest.

The detailed information on regulation choices provided by EMA can help build individualized regulation profiles. For example, Gromisch et al. (2020) used multilevel latent profile analysis of EMA data to identify five individual difference profiles varying in the tendency to deploy 10 different emotion regulation strategies. Although these researchers did not assess the situational dependency of strategy deployment, or the role of other person-level variables, it sets the stage for future work to address these interactions.

Functional Imaging

Over the past 20 years functional magnetic resonance imaging (fMRI) has begun to elucidate the neural underpinnings of emotion regulation. In a typical study, participants use one or more strategies to modulate emotional responses to stimuli on a trial-by-trial basis (Ochsner et al., 2012). While early studies aimed to understand how prefrontal regions modulate activity in regions associated with affective responding (e.g., amygdala), more recent studies have focused on interactions between distributed neural networks (Seeley et al., 2015).

Most germane to the present chapter, fMRI studies are also starting to examine how situation (e.g., mild vs. intense International Affective Picture System photos) or person (e.g., healthy vs. clinical participants) variables interact with strategy (e.g., reappraisal vs. distancing) choices to predict regulatory success at both the behavioral and neural levels (Kanske et al., 2015).

Another exciting development is the use of alternative imaging technologies, such as functional near-infrared spectroscopy (fNIRS). Although fNIRS provides lower-depth penetration than fMRI, it has better time resolution, is portable, and is relatively easy to use (Dieffenbach et al., 2021). Because it doesn't involve lying in a narrow tube and tolerating the sudden and loud noises made by an fMRI scanner, it may be better tolerated by vulnerable populations, including children and those with anxiety or trauma exposure. For example, Balters et al. (2021) used fNIRS responses to fearful and neutral faces to identify a neural biomarker of PTSD symptom severity in trauma-exposed youth. More generally, the portability and relative simplicity of fNIRS may prove especially useful for studying groups that, for geographic, socioeconomic, or clinical reasons, can't or won't come to a centralized fMRI facility.

Studying the Social Context of Emotion Regulation

In the past decade, researchers have also begun to pay more attention to the social aspects of emotion regulation, including (1) how the presence of others impacts the way we self-regulate our emotions, and (2) how we regulate the emotions of our interaction partners. In a person × situation × strategy interaction framework, we can think of other people as the situational variables with which our own individual differences and strategy choices interact.

Self-Regulation in Social Contexts

Both lab and EMA methods have been used to investigate how—and to what effect—people implement self-regulation strategies in the presence of other people.

LAB-BASED BEHAVIORAL STUDIES

Most behavioral studies, conducted in lab settings, seek to understand the personal and social impacts of using a specific strategy (e.g., reappraisal, suppression) while one has a conversation about a neutral versus upsetting versus happy topic with another person (e.g., stranger vs. relationship partner). Outcomes of interest for regulators and their partners include self-reported emotions and feelings of closeness, expressive behavior and physiology, and intimacy as exemplified by touch (Butler et al., 2003; Peters & Jamieson, 2016).

FIELD RESEARCH

While laboratory studies help identify key social consequences of different strategies, they tell us little about when, how, and why people choose to regulate in social settings. Initial studies have used EMA to document how often adults use particular self-regulation strategies when interacting with close versus distant others (Benson et al., 2019), as a function of the amount of social support received from others (Pauw et al., 2022), and how effective self-regulation is at diminishing negative affect when one is alone versus in a particular social setting (Stone et al., 2019). Future work could build on these findings by asking, for example, what situations/interactions motivate the use of specific regulatory social-regulatory strategies.

FUNCTIONAL IMAGING

For years, imaging studies have investigated the neural systems underlying affective responses to social interactions involving trust, cooperation, and inclusion/exclusion. Only recently, however, has imaging work begun to study how individuals are motivated to self-regulate their emotions in these situations. Perhaps the simplest approach focuses on one variable—for example, person-level differences in the use of a strategy like mindfulness—and relates it to the engagement of brain systems for generating and regulating social emotions like rejection (Martelli et al., 2018). More complex approaches explore person/situation/strategy interactions in the scanner by instructing different participant groups (e.g., healthy vs. depressed individuals) to deploy prespecified strategies (e.g., reappraisal, acceptance) to regulate the responses (e.g., exclusion vs. inclusion) elicited by different social situations (e.g., Cyberball, social judgment, chatroom; Platt et al., 2015). This area of research is in its relative infancy, but holds great promise for clarifying how we engage neural networks for emotion and control in response to the presence and actions of others.

Social Regulation

In addition to recognizing that we often regulate our own emotions in social contexts (English et al., 2017), attention is turning to studying the ways our emotions can be regulated by other people in social interactions (Zaki & Williams, 2013). While *self-regulation*

refers to an individual's efforts to modify their own emotions, *social regulation* refers to one person's (the regulator) deliberate attempts to change the emotional response of another person (the target; Reeck et al., 2016).

LAB-BASED BEHAVIORAL STUDIES

The majority of social regulation studies have focused on the target, asking how different types of social regulation impact their emotions. Perhaps the simplest examples come from a hand-holding paradigm that offers myriad options for studying how one's physical proximity—and relationship—to another person impacts responses to an aversive stimulus (Coan & Sbarra, 2015). Methods for studying self-regulation strategies are also being adapted for studying social regulation. For example, Sahi et al. (2021) adapted a commonly used reappraisal task to ask whether self-generated reappraisals, versus listening to a friend reading reappraisals generated by the researchers, were more helpful in reducing negative affect.

Recent studies have also begun studying how regulators select and/or implement strategies to regulate others' emotions. In such studies, participants are provided with short descriptions of negative events provided either by friends (Marigold et al., 2014), online samples (Shu et al., 2021), or confederates (Sahi et al., 2022) and are then asked to offer written support. This design allows researchers to manipulate features of targets (e.g., self-esteem), the eliciting event/emotion (e.g., anxiety vs. sadness), or the strategy used (e.g., validation vs. reappraisal) to investigate how each of these factors influences the effectiveness of social regulation.

FIELD STUDIES

Daily diary and EMA methods have been used to investigate how romantic couples, parents and children, friends, and even families influence one another's emotions in daily life. Advancements in multilevel modeling for dyads, such as actor–partner interdependence, dynamic structural equation modeling, and multilevel vector autoregressive network modeling, have allowed researchers to use intensive repeated measures from two or more actors to understand how people causally influence one another's emotions in daily life. Additionally, field studies can be supplemented with sensing technology, such as miniaturized microphones, video cameras, or electrocardiographic sensors, to richly characterize emotion-eliciting situations and responses (Smith et al., 2022).

Social regulation is also being studied by adapting/adopting internet-based platforms that facilitate repeated interactions among multiple individuals in larger groups. For instance, Doré et al. (2017) used an online platform where users could share negative experiences, as well as write supportive responses using acceptance or reappraisal. This design allowed situations and resulting emotions to vary freely, but constrained the strategies participants could use for social regulation.

FUNCTIONAL IMAGING

Functional imaging work on social regulation is just beginning. To date, a few fMRI studies have adapted behavioral paradigms for studying social proximity effects (Beckes et al., 2021), but no studies have examined social regulation in a conversational or interactive context. Hyperscanning, which simultaneously collects fMRI or electroencephalogram (EEG) data from two or more people in social interactions, hold promise for

future work. Although the interpretation of brain-to-brain patterns of coherence remains a topic of debate, recent advancements in engineering and analytical tools are encouraging. Hirata et al. (2014), for instance, developed a promising magnetoencephalography (MEG) hyperscanning system for studying brain-to-brain mother–child interactions.

Conclusions and Future Directions

In this chapter, we tried to illustrate what we think is a fundamental, yet sometimes overlooked aspect of research methods—namely, that depending on the question you ask, different methods must be used to obtain the answer. In the last decade, the science of emotion regulation has moved away from studying the main effects of strategy implementation and toward exploring the interdependence of individual, situational, and strategic factors. As a consequence, new paradigms have been needed to add nuance to our understanding of when, for whom, and how specific emotion regulation strategies influence individual and social well-being. But the day is still young for the systematic study of emotion regulation, and new areas of discovery are always on the horizon. Over the next decade, we expect advances on many fronts, ranging from novel ways to study how regulatory processes shape the temporal ebb and flow of emotional states in daily life to leveraging the growing use of mobile sensing equipment to chart previously unknown situation and strategy-dependent changes in these states. We can't wait to see what's next.

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CHAPTER 3

Assessing Individual Differences in Emotion Regulation

HABITUAL STRATEGY USE AND BEYOND

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Individuals differ from one another in the ways they regulate their emotion (see John & Eng, 2014), and these individual differences are key vulnerability and protective factors for health and well-being (see Cludius & Ehring, this volume; Mauss & Troy, this volume). The majority of individual differences research has focused on how people differ in their *habitual* tendencies to use particular emotion regulation strategies—however, people also differ in several other aspects of emotion regulation, such as how many strategies they use in their attempts to regulate, how flexibly and appropriately they switch between strategies, and the self-perceived and actual effectiveness of their emotion regulation attempts. In this chapter, we first review the literature on habitual emotion regulation. Then, we provide an overview of the burgeoning literature on individual differences in other aspects of emotion regulation. We conclude by identifying key open questions and outlining an agenda for future research.

Habitual Emotion Regulation

Individual differences in habitual emotion regulation refer to systematic and reliable differences in people's tendencies to use specific processes to regulate their emotions (John & Eng, 2014). Research on these individual differences has focused on processes derived from the process model of emotion regulation (Gross, 1998, 2015), including situational, attentional, cognitive change, and response modulation strategies. In Table 3.1, we list commonly studied strategies and individual differences measures for each of these emotion regulation processes.

TABLE 3.1. Emotion Regulation Processes, Strategies, and Habitual Measures Derived from the Process Model of Emotion Regulation

Processes	Situational strategies	Attentional deployment	Cognitive change	Response modulation
Strategies	Situation selection Situation modification Active coping	Rumination Distraction	Reappraisal/reframing Emotional acceptance	ERQ Suppression scale (Gross & John, 2003; e.g., "I control my emotions by changing the way I think about the situation I'm in") Temporal Distancing Questionnaire (Bruehlman-Senecal et al., 2016; e.g., "I tell myself that my feelings about the event are temporary") FFMQ Nonjudgment subscale (Baer et al., 2006; e.g., "I tell myself I shouldn't be feeling the way I'm feeling") (reverse-scored) Emotional Acceptance Measure (John & English, 2009, unpublished; see Appendix 3.1; e.g., "I simply accept my emotions as a natural response to the particular circumstances I am in")
Habitual measure(s)	Situation Selection Measure (Gross & John, 2003a, unpublished; see Appendix 3.1; e.g., "I control my emotions by carefully choosing the situations I get myself into") Single-Item Situation Modification Measure (Gross & John, 2003b, unpublished; see Appendix 3.1; e.g., "I control my emotions by changing the particular situation I happen to be in") COPE active coping scale (Carver et al., 1989; e.g., "I've been taking action to try to make the situation better")	RRQ Rumination (Trapnell & Campbell, 1999; e.g., "I tend to 'ruminate' or dwell over things that happen to me for a really long time afterward") Response Styles Questionnaire Ruminating (Nolen-Hoeksema & Morrow, 1993; e.g., "How often do you think 'Why do I always react this way?'") Distraction Measure (Mauss et al., unpublished; see Appendix 3.1; e.g., "When I want to feel less negative emotion [such as sadness or anger], I distract myself from the things that are making me feel bad") COPE Self-Distraction scale (Carver et al., 1989; e.g., "I've been turning to work or other activities to take my mind off things")	ERQ Reappraisal scale (Gross & John, 2003; e.g., "I control my emotions by not expressing them") Temporal Distancing Questionnaire (Bruehlman-Senecal et al., 2016; e.g., "I tell myself that my feelings about the event are temporary") FFMQ Nonjudgment subscale (Baer et al., 2006; e.g., "I tell myself I shouldn't be feeling the way I'm feeling") (reverse-scored) Emotional Acceptance Measure (John & English, 2009, unpublished; see Appendix 3.1; e.g., "I simply accept my emotions as a natural response to the particular circumstances I am in")	

Note. RRQ, Reflection and Rumination Questionnaire; ERQ, Emotion Regulation Questionnaire; COPE, Coping Orientation to Problems Experienced; FFMQ, Five Facet Mindfulness Questionnaire.

Major Emotion Regulation Strategies and Relevant Measures

Of the various emotion regulation processes in Table 3.1, habitual cognitive change and response modulation strategies have received the most empirical attention. This focus is due in large part to the popularity of the Emotion Regulation Questionnaire (ERQ), a widely used self-report measure of habitual cognitive reappraisal (a cognitive change strategy) and habitual expressive suppression (a response modulation strategy; Gross & John, 2003). Research using the ERQ has found that (1) individuals reliably differ in their habitual use of reappraisal and suppression, (2) use of the two strategies are relatively uncorrelated, and (3) these individual differences reflect key protective and vulnerability factors for psychological health outcomes (John & Gross, 2004). Reappraisal involves reframing an emotional event to change its emotional impact, and greater habitual reappraisal has generally been associated with *better* emotional, social, and well-being outcomes (see John & Eng, 2014). By contrast, expressive suppression involves suppressing the outward expression of one's emotions, and greater habitual suppression has generally been associated with *worse* emotional, social, cognitive, and well-being outcomes (see John & Eng, 2014). For more discussion of cognitive reappraisal and expressive suppression, see Uusberg and Uusberg (this volume) and English (this volume).

Another important but relatively less studied cognitive change strategy is emotional acceptance. We view emotional acceptance as a cognitive change strategy that involves shifting one's appraisals of one's emotions (e.g., instead of being upset about being angry, one accepts the anger). The Nonjudgment scale from the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) has been used to assess habitual emotional acceptance—however, this measure is much broader than emotional acceptance: It was developed to assess a facet of mindfulness that focuses on the absence of *negative* and *self-critical judgments* of *both* one's emotions and cognitions. Moreover, the FFMQ Nonjudgment scale entirely comprises reverse-keyed “self-judging” items and includes no items asking about acceptance. Using this broader measure, greater habitual acceptance has generally been associated with better psychological health outcomes (Ford et al., 2018). For more discussion of emotional acceptance, see Shallcross and Hill (this volume).

A sizable literature has also identified systematic individual differences in rumination, an attentional deployment strategy that involves a repetitive focus on one's negative emotions (e.g., Nolen-Hoeksema et al., 2008; Nolen-Hoeksema & Morrow, 1993; Trapnell & Campbell, 1999). Greater habitual rumination has been associated with negative outcomes, including increased risk for psychopathology, especially depression (Aldao et al., 2010). The Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) is a useful measure because it distinguishes between habitual rumination (i.e., repetitive focus on one's *negative internal experiences* without a processing goal) and habitual reflection (i.e., intentional processing of one's *internal experiences in general* with the goal of learning more about them), with only rumination associated with negative outcomes. For more discussion on rumination, see Watkins (this volume).

In addition to habitual emotion regulation, individual differences in affect regulation have also been addressed in stress-and-coping frameworks (Lazarus & Folkman, 1984; Carver et al., 1989). The most common measure of habitual coping tendencies is the Coping Orientation to Problems Experienced (COPE) Inventory (Carver et al., 1989), with 14 coping style scales that can be administered in either dispositional or situational formats (i.e., Self-Distraction, Active Coping, Denial, Substance Use, Emotional Support, Instrumental Support, Behavioral Disengagement, Venting, Positive Reframing, Planning, Humor, Acceptance of the Situation, Religion, and Self-Blame); see John and

Eng (2014) for a comparison of the COPE scales with the emotion regulation process model.

What Does Habitual Emotion Regulation Capture?

Compared to laboratory experiments, a major strength of individual differences research is that individual difference measures can be used to understand the antecedents and consequences of emotion regulation *in everyday life*—that is, *outside of the lab* and *across time*. Given this, to what extent should we expect individual differences in habitual emotion regulation to map onto individual differences in emotion regulation assessed in specific situations people encounter in their everyday lives? Two theories are relevant to this question: *whole-trait theory* (Fleeson & Jayawickreme, 2015) and the *accessibility model* of emotional self-report (Robinson & Clore, 2002). Whole-trait theory describes the extent to which measures of broad personality traits should correspond with relevant states or experiences in specific situations. Applied to emotion regulation, traits capture density distributions of states (i.e., general trends over time). Thus, traits (in this case, habitual emotion regulation measures) should be moderately to highly correlated with the *mean* of repeatedly and comprehensively sampled states (in this case, emotion regulation use in specific situations, like in diary or experience sampling studies).

By contrast, the accessibility model of emotional self-report (Robinson & Clore, 2002) suggests that people draw on different sources of knowledge when reporting how they feel in general (global) versus how they feel right now (momentary). Applied to emotion regulation, this model suggests that people may draw on semantic knowledge when reporting their habitual emotion regulation but episodic knowledge when reporting their emotion regulation in a specific, recent situation (i.e., as in diary or experience sampling studies). The extent to which these two theories capture the relationship between habitual emotion regulation and mean emotion regulation in everyday life is not yet known.

Initial empirical work using experience sampling and daily diary designs has begun to answer this question. In general, moderate correlations (i.e., $r_s < .40$) have been observed between habitual emotion regulation and mean levels of daily emotion regulation use (e.g., Benkley et al., 2023; Ford et al., 2017; Koval et al., 2023; McMahon & Naragon-Gainey, 2020). The strength of the correlation differed across strategies, with the strongest correlation observed for rumination ($r = .40$) and the weakest correlation observed for reappraisal ($r = .14$; Koval et al., 2023). These moderate correlations are consistent with correlations between personality traits and repeatedly sampled states (average $r = .26$; Rauthmann et al., 2019).

Although these correlations may seem low at first glance, several factors may reduce the observed size of correlations between habitual and daily measures. First, considering whole-trait theory, broad traits should map onto the mean of repeatedly sampled states *only if* trait and state measures are selected appropriately and *only if* enough situations are representatively sampled within individuals' lives. Regarding the first criterion, daily life studies typically assess emotion regulation strategy use with a single item or with few items to avoid participant fatigue by repeatedly assessing a large number of items—thus, measurement reliability may be an issue for daily measures, reducing their correlation with habitual measures. Regarding the second criterion, daily life studies typically span a few days or weeks and thus cannot capture the full range of situations that people can draw upon when reporting on their habitual emotion regulation—thus, incomplete or unrepresentative sampling of situations may further reduce the size of the correlation between habitual and daily measures. Second, drawing upon the accessibility model

of emotional self-report, habitual and daily measures of emotion regulation may assess at least partially distinct constructs, as people rely on different sources of knowledge about their emotion regulation when completing the two types of measures. More work is needed to understand the factors that contribute to habitual and daily emotion regulation self-reports, as well as the factors that serve to increase or decrease the correlation between the two.

Recent empirical work has also begun to examine which stages of the emotion regulation process are captured by habitual measures of emotion regulation. The extended process model of emotion regulation (Gross, 2015) specifies three stages of emotion regulation in a specific situation: identification of the need to regulate, selection of a particular strategy to employ, and implementation of that strategy. A recent analysis of nine daily life studies (Koval et al., 2023) suggests that habitual measures of emotion regulation correlate most strongly with the selection stage in everyday life (i.e., average use of a given emotion regulation strategy) but also correlate, to a lesser extent, with the identification stage (i.e., the degree to which preceding emotion predicts emotion regulation strategy use) and the implementation stage (i.e., the degree to which emotion regulation strategy use predicts subsequent emotional changes). Habitual reappraisal in particular seems to correlate equally strongly with reappraisal selection and reappraisal implementation in daily life (Ford et al., 2017; Koval et al., 2023).

Beyond Habitual Emotion Regulation: Regulatory Repertoire, Flexibility, and Effectiveness

Although the majority of individual differences research has focused on habitual emotion regulation, people also differ in several other aspects of emotion regulation. Here, we provide a brief description of each type of individual difference concept and direct readers to relevant reviews.

First, people differ in their overall regulatory *repertoire*—that is, the number of emotion regulation strategies they use across regulatory instances (e.g., Grommisch et al., 2020) and in their tendency to use more than one emotion regulation strategy within a single regulatory instance (*polyregulation*; Ford et al., 2019). The antecedents and consequences of individual differences in repertoire and polyregulation warrant further study, given that (1) people commonly use multiple emotion regulation strategies, and (2) the number and combination of strategies used likely have important consequences for the outcomes of emotion regulation.

Second, people differ in how often (*variability*) and how appropriately (*flexibility*) they switch between strategies, both within and across regulatory instances (Bonanno & Burton, 2013; Cheng et al., 2014; see Kalokerinos & Koval, this volume). Greater flexibility is theorized to be particularly important for the effectiveness of emotion regulation, as well as for psychological health, given that no one emotion regulation strategy can be universally beneficial across all contexts (Aldao, 2013). For example, although cognitive reappraisal is beneficial on average, theory and empirical evidence suggest that it may be inert, or even harmful, in more controllable situations when negative emotion can motivate useful action to change the situation (see Ford & Troy, 2019).

Third, beyond the emotion regulation strategies that people choose to use and when they choose to use them, people also differ in emotion regulation *implementation*. At the dispositional level, emotion regulation self-efficacy beliefs capture subjective perceptions of implementation ability (Goldin et al., 2012). At the situational level, people can also

report on their subjective implementation success within a given situation (Ford et al., 2017). These subjective measures of implementation success can be distinguished from “objective” implementation success or emotion regulation effectiveness (McRae et al., 2012; Troy et al., 2010). Objective implementation success can be measured as changes in subjective experience and physiology when attempting to regulate (McRae et al., 2012; Troy et al., 2010).

Finally, a burgeoning literature has begun to consider how people differ in the strategies they use to regulate *other people’s* emotions (i.e., interpersonal emotion regulation; see Niven, this volume).

Limitations and Future Directions

Research on individual differences in emotion regulation has begun to expand beyond its initial focus on the habitual use of a few select emotion-regulatory strategies and general coping styles. This growth includes extension to less well-studied strategies; greater attention to how habitual emotion regulation maps onto emotion regulation in specific situations; and an examination of other kinds of individual differences, such as in regulatory repertoire, polyregulation, flexibility, implementation, and interpersonal emotion regulation. In this final section, we outline key open questions and directions for future research.

First, relatively little research has examined the use of *situational* strategies, like situation selection and situation modification, from an emotion regulation framework. For these strategies, the field could benefit from well-validated and widely disseminated measures that are derived from the process model of emotion regulation. In addition, the field lacks established and generally accepted measures of habitual *distraction*, and the most commonly used measure of *emotional acceptance* includes both emotions and cognitions but fails to include any true-keyed acceptance items. To encourage further research in these areas, we have provided unpublished measures of habitual situation selection, situation modification, distraction, and emotional acceptance in Appendix 3.1 at the end of this chapter.

Second, recent research has begun to examine the relationship between emotion regulation measured habitually and emotion regulation measured in specific situations. This research raises new questions about factors that contribute to correspondence, as well as discordance, between the two types of measures. Relatedly, the field will benefit from continuing to advance research on individual difference measures beyond habitual emotion regulation. For example, little research has examined individual differences in the identification stage of the extended process model. Similarly, research on emotion regulation repertoire, polyregulation, variability, flexibility, implementation, and interpersonal emotion regulation is still in its infancy.

Finally, while research on individual differences in emotion regulation has begun to consider features of the contexts in which regulation is occurring, it would also benefit from considering features of the emotion being regulated (e.g., valence, arousal, discrete emotions; see John & Eng, 2014, for a discussion). Research on emotion regulation use in everyday life suggests that people most commonly regulate their emotions in response to anger, sadness, and anxiety, but also in response to positive emotions (e.g., pride, happiness) and nonvalenced or ambiguously valenced states (e.g., surprise, apathy; Gross et al., 2006), and the effects of emotion regulation are likely to differ across different discrete emotions and affective categories (Benkley et al., 2023).

ACKNOWLEDGMENTS

Oliver John gratefully acknowledges research support from the Instituto Ayrton Senna, São Paulo, Brazil.

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APPENDIX 3.1. Unpublished Measures of Habitual Emotion Regulation

Unpublished Habitual Situation Selection Measure (General) (Gross & John, 2003a)

1. I control my emotions by carefully *choosing the situations* I get myself into.
2. When I choose friends or activities, I don't think much about how they will make me feel. (R)
3. How a situation will make me feel is of little concern to me. (R)
4. I'm careful to seek out people or situations that make me have *positive* feelings.
5. I'm careful to avoid people or situations that make me have *negative* feelings.

Unpublished Single-Item Habitual Situation Modification Measure (Gross & John, 2003b)

1. I control my emotions by *changing the particular situation* I happen to be in.

Unpublished Habitual Distraction Measure (Mauss et al.)

1. When I'm faced with a stressful situation, I distract myself from it in order to stay calm.
2. I control my emotions by directing my attention away from the situation I'm in.
3. When I want to feel more positive emotion, I direct my attention away from the situation.
4. When I want to feel more positive emotion (such as joy or amusement), I distract myself from the situation I'm in.
5. When I want to feel less negative emotion, I direct my attention away from the situation.
6. When I want to control my emotions, I'm not likely to distract myself from the situation.
7. When I want to feel less negative emotion (such as sadness or anger), I distract myself from the things that are making me feel bad.

Unpublished Habitual Emotional Acceptance Measure (John & English, 2009)

1. I simply accept my emotions as a natural response to the particular circumstances I am in.
2. When negative emotions come up, I allow myself to feel them and then I let them go.
3. I embrace my emotions, whatever they may be.
4. I find it hard to come to terms with my emotions. (R)
5. I understand I am going to have certain emotions at certain times and that is just fine.
6. As far as regulating emotions goes, I pretty much accept my emotions as they are.
7. I accept that I am going to have negative emotions sometimes.
8. I manage my emotions by allowing myself to feel and then release them.
9. Accepting my emotions is not easy for me. (R)
10. I am comfortable with my emotions—most of the time, they simply come and go.

R, reverse-scored item.

CHAPTER 4

Daily Diaries and Ecological Momentary Assessment

PETER KOVAL
ELISE K. KALOKERINOS

Emotion regulation is inherently dynamic, unfolding iteratively over time and in reciprocal relation with other psychological processes (Gross, 2015; see also Gross, this volume). This makes emotion regulation a prime candidate for study using *daily life methods*, also known as *ambulatory assessment* (Trull & Ebner-Priemer, 2014) or *intensive longitudinal* (Bolger & Laurenceau, 2013) methods. These methods involve frequent active (e.g., via self-report) and/or passive (e.g., via sensors) sampling of experience, context, behavior, and/or physiology over time in naturalistic settings (Mehl & Conner, 2012). In this chapter, we focus on the application of active self-report methods—that is, ecological momentary assessment (EMA), the experience sampling method (ESM), and daily diaries—to the study of emotion regulation processes in daily life.

In the short time since daily life methods were first used to study emotion regulation (Kashdan & Steger, 2006; Nezlek & Kuppens, 2008), the popularity of these methods has grown rapidly, facilitated by the increasing ubiquity of smartphones (Hamaker & Wichers, 2017; Kuppens et al., 2022). In this chapter, we hope to help readers navigate this burgeoning literature. We start with a brief overview of the “nuts and bolts” of using daily life methods to study emotion regulation. Next, we turn to motivating why researchers should bother using these methods by highlighting their key strengths. We then provide an overview of three key research questions that have been addressed using these methods, including empirical examples. Next, we propose a unified approach to jointly addressing these research questions using daily life data. Finally, we end with a brief discussion of some challenges facing researchers investigating emotion regulation in daily life.

The Nuts and Bolts of Studying Emotion Regulation in Daily Life

Daily life methods involve momentary or short-term retrospective assessment of psychological experience, behavior, and context. For instance, emotion regulation researchers

often use daily life methods to assess people's recent use of regulation strategies alongside other relevant variables (e.g., affective experience, goals, context). Daily diaries typically involve retrospection over an entire day (e.g., "Today, I controlled my emotions by not expressing them"), whereas EMA can involve retrospection over shorter periods (e.g., "In the last hour, I controlled my emotions by not expressing them") and/or momentary assessments (e.g., "Right now, I am controlling my emotions by not expressing them"). We refer readers interested in learning more about the nuts and bolts of daily life methods to more in-depth sources (e.g., Bolger & Laurenceau, 2013; Mehl & Conner, 2012).

Why Bother with Daily Life Methods?

Collecting self-reports once or more daily for multiple days is costly, burdensome for participants, and entails logistical and data-analytic challenges. So why bother? We discuss three primary benefits that daily life methods offer emotion regulation researchers. The first is enhanced ecological validity. Daily life methods allow us to study emotion regulation in the context of personally meaningful, real-life events, ranging from quotidian stressors and uplifts (e.g., Newman & Nezlek, 2022) to more momentous events, such as high-stakes exams (e.g., Kalokerinos et al., 2019). This contrasts with studying emotion regulation in the lab, where emotions are typically elicited by images or films (e.g., Sheppes et al., 2014), which may limit generalizability to everyday life.

Second, by assessing emotion regulation efforts and other relevant variables in (close to) real time, daily life methods capture distinct information from traditional self-reports, which may be crucial to understanding emotion regulation. Momentary self-reports (e.g., EMA) capture experiential knowledge, such as feelings and thoughts as they unfold, whereas short-term retrospective reports (e.g., daily diaries) capture episodic knowledge (i.e., memories of recent experiences and events). In contrast, traditional self-report measures require participants to aggregate information across much longer periods (e.g., weeks, months, or an entire lifetime; Willroth & John, this volume) and are thus likely to tap into abstract, semantic knowledge (Conner & Barrett, 2012; Robinson & Clore, 2002). While traditional self-reports of emotion regulation undoubtedly capture important information (e.g., people's beliefs, self-perceptions), daily life methods offer a more direct assessment of emotion regulation efforts when and where they occur in everyday life.

Finally, daily life methods provide a unique window into the dynamics of psychological processes (Hamaker & Wichers, 2017). Given that emotion regulation is fundamentally dynamic, following the trajectories of our constantly fluctuating emotions, this presents a particularly compelling rationale for emotion regulation researchers to use daily life methods. As we discuss further in the next section, daily life methods offer an opportunity to investigate the antecedents and consequences of emotion regulation by repeatedly assessing regulation efforts along with their potential causes and outcomes across time (e.g., Brans et al., 2013; Pavani et al., 2017).

Key Research Questions

Research using daily life methods to study emotion regulation has grown exponentially over the past two decades (see, e.g., Boemo et al., 2022). Here, we highlight three broad

sets of research questions that have been addressed using daily life methods, emphasizing the unique perspectives these methods offer over lab and traditional self-report methods. Figure 4.1 provides an overview of how these research questions have been tested using daily life data. Specifically, in Figure 4.1, we depict measures of emotion regulation (e.g., strategy use, degree of effort) as gray-shaded rectangles, and measures of possible antecedents and/or consequences of emotion regulation (e.g., affective experience, goals, contextual variables) as unshaded rectangles, both assessed at three successive time points (i.e., $t - 1$, t , and $t + 1$).

Emotion Regulation Tendencies

Researchers have used daily life methods to investigate a number of different emotion regulation tendencies, such as the frequency of different emotion regulation goals or motives (e.g., English et al., 2017), or the breadth and content of people's daily emotion regulation strategy repertoire (Grommisch et al., 2020; see also Kalokerinos & Koval, this volume). However, most of the diary/EMA research on tendencies has sought to quantify how much (or how often) people tend to use specific emotion regulation strategies in daily life (e.g., Brans et al., 2013; Heiy & Cheavens, 2014; Wylie et al., 2023). As shown in Figure 4.1, the tendency to use emotion regulation strategies is typically operationalized as a person's (observed or latent) mean endorsement of each regulation strategy across all measurement occasions. Recent studies show that diary/EMA measures of emotion regulation tendencies do not correspond strongly with global self-reports of the same (Koval et al., 2023; McMahon & Naragon-Gainey, 2020). Although both methods may be valid, this divergence suggests that researchers should consider using daily life methods if their focus is on assessing emotion regulation attempts as they occur, rather than people's beliefs about regulation tendencies.

Antecedents and Consequences of Emotion Regulation

Emotion regulation researchers have also sought to leverage the dynamic, repeated assessments afforded by daily life methods to investigate the antecedents and consequences of everyday emotion regulation. As shown in Figure 4.1 (see black arrows), such research questions are typically tested using lagged analyses, in which emotion regulation measured at one occasion (t) is regressed onto possible *antecedents* measured at the previous occasion ($t - 1$), or is used to predict possible *consequences* measured at the next occasion ($t + 1$). These analyses typically control for persistence in the theorized outcome(s) by modeling their autoregressive effects (see gray arrows in Figure 4.1). Under certain assumptions, this allows researchers to make inferences about causality (Zyphur et al., 2020). Although nonlagged (i.e., contemporaneous) analyses are sometimes used to investigate antecedents and consequences of emotion regulation, this limits the ability to infer the direction of causality. Given that emotion regulation processes have been theorized (e.g., Gross, 2015) and empirically shown (e.g., Pavani et al., 2017) to be bidirectionally related with other processes, such as affective experience (see also Figure 4.1), correctly specifying the directionality of effects is important—thus, for researchers interested in modeling antecedents and/or consequences of emotion regulation in daily life, we recommend collecting data with multiple measurement occasions per day (e.g., EMA) and testing lagged models.

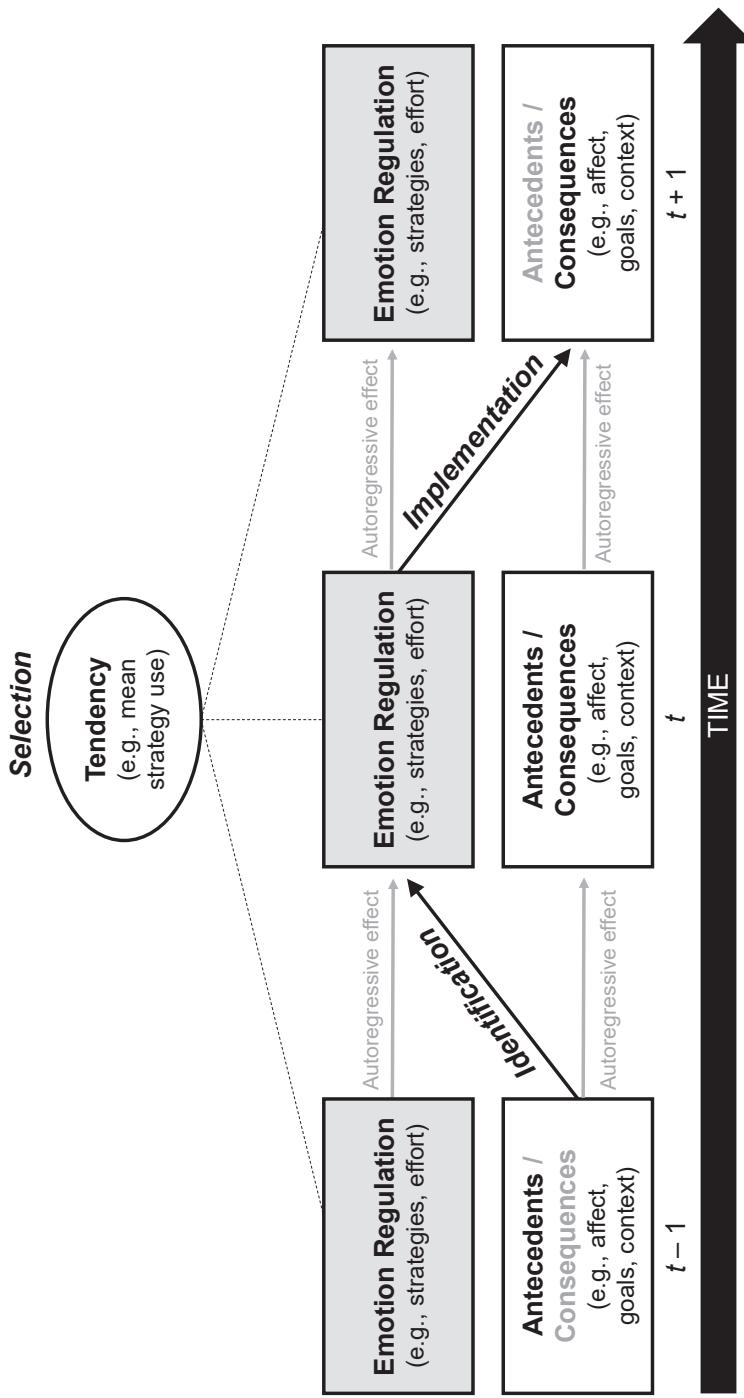


FIGURE 4.1. Illustration of key research questions regarding emotion regulation processes that can be tested using daily life (e.g., EMA) data.

Antecedents

Studies have investigated several possible antecedents of daily emotion regulation, including affective experience (e.g., Brans et al., 2013; Pavani et al., 2017), motives/goals (e.g., English et al., 2017), daily events (e.g., Newman & Nezlek, 2022), the presence of (close) others (English et al., 2017), perceived social support (e.g., Pauw et al., 2022), perceived situational control (e.g., Medland et al., 2020), and emotion beliefs (Wittkamp et al., 2022), among others.

Some studies have sought to replicate lab findings, yielding divergent results. For example, in the lab, participants show a consistent preference for regulating with distraction in response to more intense emotional stimuli, but reappraisal in the context of less emotionally intense stimuli (Sheppes et al., 2014)—however, support for these findings is mixed in daily life. Consistent with the lab, some daily life studies have reported decreases in reappraisal in the context of more intense emotions/stressors (e.g., Blanke et al., 2022), whereas others have reported the opposite (Hiekkaranta et al., 2022). Hiekkaranta et al. also found that distraction increased in the context of more intense negative events in daily life, replicating the lab, whereas other studies have reported no association between intensity and distraction (e.g., Blanke et al., 2022). These mixed findings highlight the importance of testing the generalizability of lab research to everyday contexts, where the antecedents of emotion regulation may be more complex.

Consequences

Given that a primary goal of emotion regulation is to influence emotion, it is not surprising that many EMA and daily diary studies have investigated the affective consequences of regulation in daily life. A recent meta-analysis by Boemo et al. (2022) identified 76 such studies (37 EMA and 39 daily diary), although only a subset of these used lagged analyses to test prospective relations between emotion regulation strategies and subsequent affect. There were significant positive associations between both rumination and suppression and future negative affect, and significant positive associations between both distraction and reappraisal and future positive affect—however, after controlling for lagged affect, only the affective consequences of rumination and reappraisal remained. These meta-analytic findings suggest that the affective consequences of using rumination and reappraisal in daily life may be valence specific, in contrast to evidence from lab experiments (e.g., Kalokerinos et al., 2015) and global self-reports (e.g., Gross & John, 2003).

Finally, although emotion regulation frequently targets emotional experience, not all regulation efforts are directed at changing how we feel. Thus, it is important for daily life research to investigate other consequences beyond affective change. For example, a small number of studies have investigated perceived regulation success, which may capture emotional as well as nonemotional (e.g., instrumental) outcomes of daily emotion regulation efforts (Pauw et al., 2022; Wylie et al., 2023).

Putting It All Together: A Unified Approach to Studying Everyday Emotion Regulation

Our review highlights how diary/EMA methods allow researchers to capture different aspects of the emotion regulation process. We have recently argued (see Koval et al., 2023) that these aspects of daily emotion regulation can be mapped onto the three main

stages of emotion regulation—*identification*, *selection*, and *implementation*—proposed in Gross's (2015) extended process model. We illustrate this mapping in Figure 4.1 (see italicized text): the degree to which emotion regulation strategies/effort are predicted by antecedents (e.g., previous affect) maps onto the *identification* stage; the influence of regulation strategies/effort on consequences (e.g., subsequent affect) represents *implementation* success; and average tendencies to use particular strategies (vs. others) can be regarded as representing *selection*.

While we hope this mapping serves as a useful heuristic, we also acknowledge that reality is more complex. First, the same variables (e.g., affect) are often proposed to be both antecedents and consequences of emotion regulation in daily life (e.g., Brans et al., 2013; Pavani et al., 2017). This implies a kind of reciprocal causality, which is poorly captured using standard linear models, such as those typically used to analyze daily diary and EMA data. Moving forward, emotion regulation researchers may profit from adopting analytic tools developed by ecologists (and others) to understand dynamics in complex systems, which can incorporate phenomena such as reciprocal causality (cf. van Berkel et al., 2021).

Second, the theorized stages of emotion regulation may be difficult to clearly demarcate in daily life data. For instance, changes in affect may trigger general emotion regulation effort during the identification stage, but affect may also influence the selection of specific strategies (e.g., Hiekkaranta et al., 2022), making it challenging to pinpoint which precise stage of regulation is implicated. Furthermore, the influence of affect on strategy selection may vary over time within a single emotional episode (Kalokerinos et al., 2017). As a final example, affect intensity may moderate the implementation of emotion regulation strategies (e.g., Blanke et al., 2022; Wylie et al., 2023). Put otherwise, antecedents may moderate consequences. Modern theoretical accounts, such as Gross's (2015) extended process model and theories of emotion regulation flexibility (see Kalokerinos & Koval, this volume), acknowledge such complex dynamic interplay between stages of emotion regulation—however, this suggests that researchers should be cautious in drawing inferences from daily life data about which stage of emotion regulation is driving observed effects.

Where to from Here? Addressing Key Challenges

We believe research using daily life methods has a bright future—however, we want to end by highlighting three key challenges that we hope will be addressed (see also Kuppens et al., 2022). First, developing psychometrically sound daily life measures has often been neglected in favor of addressing substantive research questions. Given the shortcomings of simply transplanting items from validated global self-report measures into daily life research, it is important to develop new scales specifically designed for daily administration (e.g., Medland et al., 2020) and to thoroughly explore the psychometrics of daily emotion regulation measures (e.g., McMahon & Naragon-Gainey, 2019).

Second, the true timescale of emotion regulation processes in daily life remains largely unknown. This is problematic, given that the sampling frequency of EMA/diary studies should be guided primarily by theory (Hopwood et al., 2022)—thus, there is a need for research investigating how emotion regulation processes play out at different timescales. As self-reports become increasingly burdensome at higher sampling frequencies, researchers may also need to consider incorporating passive sensing methods into their study of daily emotion regulation.

Finally, although measurement reactivity has been investigated in daily life research more broadly (e.g., De Vuyst et al., 2019), we are not aware of research investigating how EMA/diary assessment of emotion regulation may influence regulatory behavior in particular. Understanding how frequent self-monitoring of emotion regulation processes (via EMA/diaries) impacts regulatory processes has implications not only for measurement but also for digital emotion regulation interventions (see Niles, this volume).

Conclusion

EMA and daily diary methods offer a means of capturing how emotion regulation unfolds dynamically in the rich and varied contexts people navigate in their everyday lives. In this chapter, we have highlighted the unique benefits of daily life methods: capturing regulation processes in (close to) real time, enhancing ecological validity, and enabling the study of dynamic processes. These methods have allowed researchers to learn about emotion regulation tendencies, antecedents, and consequences in daily life, and in some cases have produced meaningfully different results to those obtained in lab experiments and traditional self-reports—thus, although daily life methods also present unique challenges, some of which we have discussed here, they will no doubt continue to be important tools for emotion regulation researchers moving forward.

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CHAPTER 5

Studying the Dynamics of Emotion Regulation with Time-Series Data

EMILY A. BUTLER

The production of high-quality scientific knowledge requires a tight integration of theory and method. The theory provides the map, while the method provides the compass. You need to use them together to chart new territory and communicate what you find. This chapter introduces a theory (dynamic system [DS]) and a method (building and testing mathematical models with time-series data: “time-series modeling”) that have been used together to advance knowledge in a wide range of scientific domains, including social psychology (Wiese et al., 2010) and cognitive neuroscience (Haykin & Fuster, 2014), but that have been underused in the study of emotion regulation.

Why Bother?

The basic motivations for DS theory and time-series modeling are quite straightforward. Everything in our known universe happens over time. So, if we are going to use the scientific method to understand and intervene in anything, we need to think about how things change over time (DS theory) and use empirical measurements taken repeatedly (time-series modeling) to evaluate our ideas. Any snapshot in time (e.g., cross-sectional data) provides very weak evidence, since the variables could have come together in that momentary configuration through numerous ways.

Figures 5.1A, B, and C demonstrate the limitations of cross-sectional data with an example of two individuals. Figure 5.1A shows that, if measured at time 3, Person 1 is higher on both depression and anger than Person 2, implying a positive correlation. But if the measures were taken instead at time 5, Person 1 is higher on depression, but lower on anger, implying a negative correlation. Which is correct? We can’t know without considering the pattern over time, as shown in Figure 5.1C. Here it can be seen that depression and anger are negatively correlated over time. Whenever either person’s depression

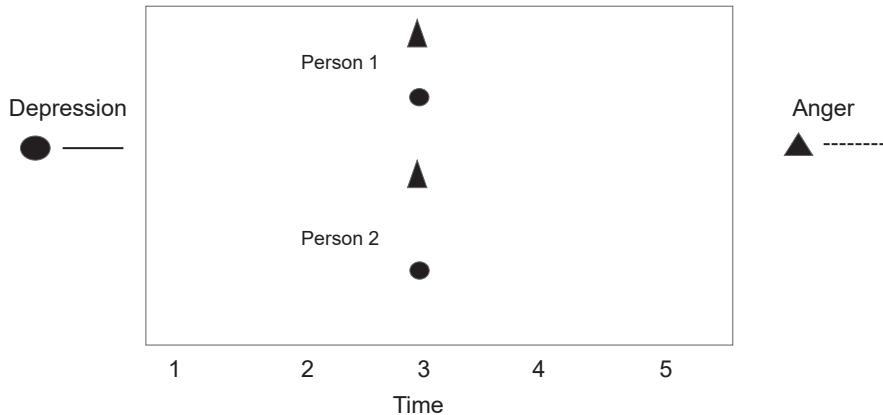


FIGURE 5.1A. Cross-sectional data for two individuals at time 3.

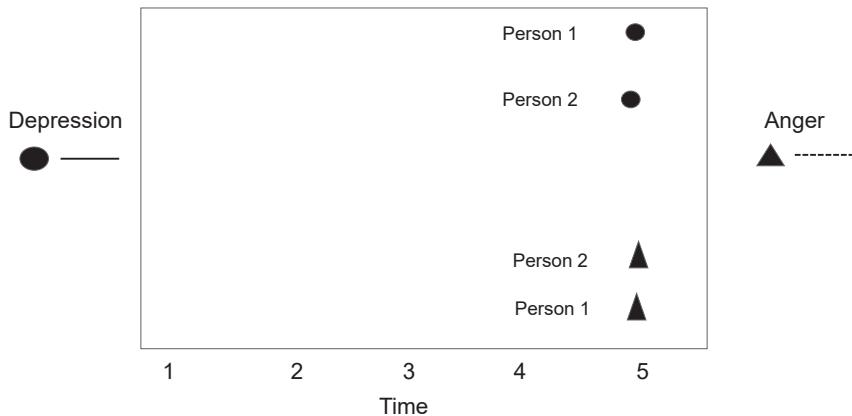


FIGURE 5.1B. Cross-sectional data for two individuals at time 5.

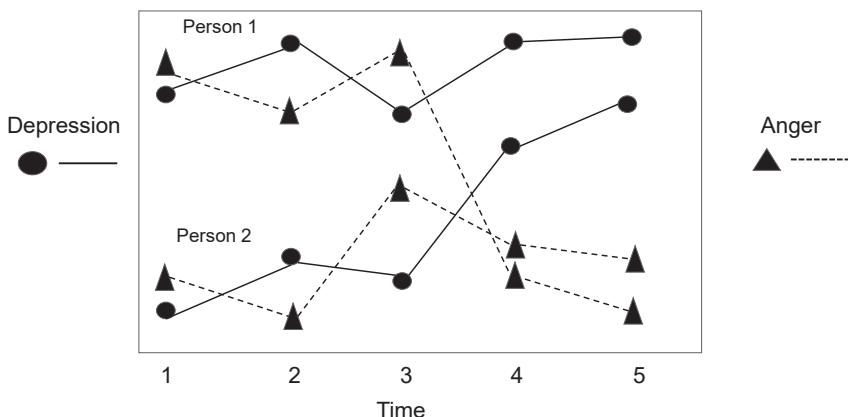


FIGURE 5.1C. Time-series data for five points and two individuals.

increases, their anger decreases and vice versa. This process intensifies at time 3, resulting in an overall negative correlation at time 5.

As another example, consider the potential roles of poor emotion regulation and helplessness as risk factors for depression (Ebrahimi et al., 2021). Assume that we measure those three variables in a large sample of people and find that they are correlated. What can we conclude? I would argue, very little. The variables may all be indicators of high stress, or some other unmeasured variable. Even if they are directly related, the pattern of influence could be in any order. It's possible that depression is driving the assumed risk factors, rather than the other way around. In contrast, by taking a DS perspective and using time-series modeling with daily measures for 40 consecutive days, Ebrahimi and colleagues (2021) were able to demonstrate that higher levels of helplessness on one day predicted increases in poor emotion regulation and depression over subsequent days, setting in motion a vicious cycle involving the amplification of all three variables. These results suggest that an intervention would be most efficient if it targeted helplessness, rather than the other two variables.

A related problem with taking a snapshot in time is referred to as Simpson's paradox (Kievit et al., 2013). Associations at the aggregate level (e.g., a person's average scores over time) can be completely different from associations at the temporal level (e.g., a person's time-varying scores over time). A classic example is that people who get more exercise are less likely to suffer a heart attack (between-person association), but someone is at a higher risk of having a heart attack when they are exercising than when resting (within-person association). To illustrate this, Figure 5.2 shows the chance of heart failure for three people (triangle, oval, and star) at three time points for each person. If we don't take into account the temporal nature of the data, we would get the total correlation in the first panel, which would be approximately zero. If we focus instead on each person's average scores, we would get the between-person correlation shown in the second panel, which would be strongly negative. Star does the most exercise on average and has the lowest overall chance of heart failure. But if we focus on within-person variability, we see that each person's risk of heart failure is higher at a time when they are exercising more, producing a strong negative within-person correlation.

It is impossible to tease these different processes apart without time-series modeling. An example in the domain of emotion regulation comes from the same study of depression described above (Ebrahimi et al., 2021). On days when people experienced

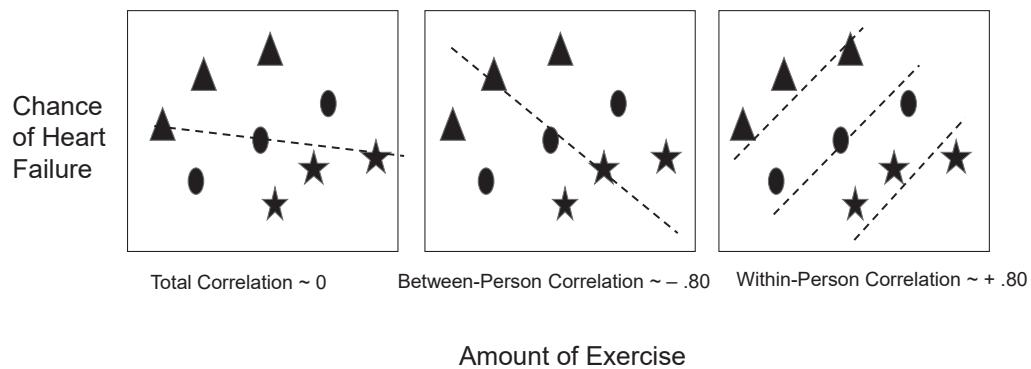


FIGURE 5.2. An example of Simpson's paradox.

greater emotion regulation difficulties than their own average, they also experienced increased feelings of worthlessness (within-person association)—however, people who had greater emotion regulation difficulties compared to others were not the ones who felt more worthlessness on average (between-person association). Thus, any intervention would have to focus on day-to-day within-person variations in emotion regulation, not between-person differences.

DS Theory

DS theory describes how things change (or don't) over time. Formally, a DS is defined in mathematical terms, but that is beyond the scope of this chapter. In descriptive terms, a DS refers to a set of variables that interact with one another over time, such that the overall behavior of the system is driven by the interactions among the variables, not purely by external forces (Wiese et al., 2010). In addition, the interactions among the elements of the system give rise to higher-order emergent states, which cannot be reduced to the states of the individual elements (Wiese et al., 2010). For example, a person can be seen as a DS, made up of interacting biological and psychological processes (within-person associations) that produce the person's overall relatively steady states compared to other people (between-person associations), such as their general well-being.

One strength of DS theory is that it is very general, with many different formulations possible depending on the explanatory goal. In the case of emotion regulation, there are at least two ways to think about it from a DS perspective: (1) as a component of a larger system, where emotion regulation interacts with other variables to give rise to overall states such as mental health; and (2) as a temporal sequence of lower-level processes, as outlined by the process model of emotion regulation (Gross, 2015), which suggests that emotion regulation occurs in temporal stages. In this view, emotion regulation itself is a DS that includes the components of evaluating an emotion as “good for me” or “bad for me,” choosing a strategy (if the first step concludes it is warranted) and implementing it. Neither of these applications of DS theory are better or worse, they just emphasize different levels of the system (e.g., the role of emotion regulation within a larger system vs. the component steps of emotion regulation).

Characteristics of Change

One way of looking at change is with summary statistics that describe its characteristics, such as how highly correlated its states are from one time to the next (inertia). High inertia has been considered to be an indicator of poor emotional resilience, since it suggests that once a person is upset, they stay that way and have difficulty moving back into a calm state (Kuranova et al., 2020). As an example of this, one study of at-risk adolescents collected momentary self-reports 10 times a day for 6 days at baseline and then followed up a year later. Adolescents whose emotional responses to minor daily events had higher inertia at baseline (e.g., tended to stay in the same state for longer periods of time) developed more psychopathological symptoms over the following year, providing some evidence that high inertia in response to daily life may provide an early-warning signal of a deteriorating emotional system (Kuranova et al., 2020).

In other work, a meta-analysis assessed associations between well-being and several characteristics of change for emotional experience (Houben et al., 2015). It found evidence that greater emotional variability (the total range of a person's emotions), more

instability (the tendency for a person's emotions to bounce back and forth), and higher inertia were all associated with lower well-being, especially for negative emotions. These results suggest that optimal emotional dynamics are characterized by moderate fluctuations over time, with emotions that neither bounce erratically nor become stuck in steady states.

Trajectories of Change

Another way of looking at change is with models that represent the trajectories over time that the elements of the system go through. For example, emotions can oscillate with different frequencies and those oscillations may amplify (e.g., become larger) or damp (e.g., stabilize; Chow et al., 2005). One example in this domain comes from a study of women's adaptation to widowhood, where the women reported daily for almost 100 days following the loss of a spouse (Bisconti & Bergeman, 2007). Women who engaged in more emotion-focused social coping had a steeper recovery slope for well-being. In addition, their oscillations in mental well-being damped more (i.e., their recovery was more stable). Another example involves psychiatric outpatients at high risk of committing violence who were assessed weekly for 26 weeks (Odgers et al., 2009). Patients whose psychiatric symptoms entered a pattern of high-frequency oscillation with amplification were more likely to commit a serious violent act (e.g., resulting in injury to another person) during the time of the study.

Coupling

The strength of influence between the variables in a system is called coupling. It is the source of feedback loops, both positive (more of variable A produces more of B, which produces more of A, etc., thereby generating amplification) and negative (more of variable A produces less of B, which produces less of A, etc., thereby generating damping). Understanding feedback is critical for developing effective interventions, since if the coupling between mutually reinforcing undesirable variables can be weakened, it is likely to reduce the levels of all the undesirable variables at once. One 56-day diary study of older adults, for example, found that higher levels of self-reported resilience (a combination of agency, persistence, and challenge orientation) was associated with decreased coupling between stress and negative affect, which was accompanied by faster damping of both (Montpetit et al., 2010).

Attractors

The state of a system is defined by the set of values for all the variables involved at a given point in time (Hollenstein, 2015). States that occur frequently and persist for longer durations are called attractors (Hollenstein, 2015). They represent the homeostatic set points for the system that it tends to return to when not being influenced by external forces. Interventions can be thought of as attempts to change a person's attractors, away from undesirable ones and toward more constructive ways of being. In the context of emotion regulation, a study of adolescents found that better ability to inhibit behavior predicted a reduced tendency to get into an attractor state characterized by high anger. Specifically, adolescents with higher behavioral inhibition showed anger responses in daily life (hourly reports for 3–4 days) that rose less quickly and leveled off faster, resulting in them spending less time in anger states (Hoeksma et al., 2007).

Time-Series Modeling

The number of temporal observations one needs to make use of time-series modeling depends on the complexity of the model. As few as five time points may be enough for simple approaches, such as multilevel models. In general, however, 15–20 repeated measurements are the minimum needed for robust time-series modeling. These kinds of data are becoming fairly common, due to the increasing popularity of daily diaries and experience sampling (see Koval & Kalokerinos, this volume). Although using DS models and time-series data can be daunting—and the details of implementation are beyond the scope of this chapter—a number of well-documented software packages and empirical articles that include methodological guidance are making the task easier (see citations below). There are many DS models to choose from, depending on what aspects of change one wants to focus on. In this section, I briefly discuss some that can be used for assessing the DS aspects described above (e.g., characteristics and trajectories of change, coupling, and attractors).

The simplest approach is to use summary statistics to represent characteristics of change. Those can then be used as predictors or outcomes in between-person analyses of other variables. Koval et al. (2013) provide an excellent introduction to this approach. As an example, one study considered variability of emotion regulation strategies, both in terms of between strategy (e.g., how much variability there is in the types of strategies a person uses over time) and within strategy (e.g., how much variability there is for a given strategy used by a person over time; Wang et al., 2021). They found that both forms of variability were associated with lower depressive symptoms and less inertia for negative emotion.

Coupled linear oscillator (CLO) models have been used fairly extensively to investigate trajectories of emotion change. Explanations of the models and methodological guidelines can be found in many places (e.g., Chow et al., 2005; Hessler et al., 2013), as well as the documentation for the *rties* and *dynr* R packages (Butler & Barnard, 2019; Ou et al., 2019). The main strength of CLO models is their ability to represent complex trajectories, including varying frequencies of oscillation, along with damping or amplification. They can also be used to assess coupling or attractors. Many of the empirical results presented in the previous section were produced using CLO models.

Dynamic network models focus on the connections between “nodes” (e.g., variables) in a system and are excellent for assessing coupling and feedback loops. Bringmann and colleagues (2022) provide a thoughtful overview of methodological issues to consider when using network models that also apply to most other time-series approaches. One version of the model explicitly includes “resilience factors,” such as emotion regulation, as separate network nodes in addition to nodes representing maladaptive factors, such as psychopathological symptoms (Kalisch et al., 2019). The resilience nodes estimate whether something like emotion regulation can weaken symptom–symptom interconnections or symptom inertia, thereby preventing maladaptive emergent system states.

Finally, a number of methods exist for assessing attractors. One intuitive approach uses “state-space grids,” which are visual representations of the states a system goes through (Hollenstein, 2013). Free software provides the visualizations, along with summary statistics that can be used as predictors or outcomes of other variables (Lamey et al., 2004). Many more complex approaches also exist. A recent example focuses on children’s anger expressions during a frustrating waiting task, in combination with two forms of emotion regulation (bidding for the mother’s attention and distraction; Yang et al., 2021). The authors show how the networks can be built, interpreted, and manipulated to predict

which strategies are most likely to move a given child into an attractor state (e.g., a steady state) where “anger” is “off.” Empirical results indicated that different children showed quite different emotion regulation dynamics, including which strategy to try to enhance or reduce in order to regulate anger.

Future Directions

Despite the success of DS theory and time-series modeling over the last century in achieving things like landing spacecraft on their intended target, they have only recently been seriously applied in social science. The domain of emotion regulation appears to be even further behind. In writing this short chapter, very few decisions needed to be made about what to cite, since there was so little to choose from that explicitly addressed emotion regulation. So, there is plenty of work left to be done. Given the lack of a research base, initial steps need to be at least partly exploratory, since basic questions such as “What is the time course for implementing an emotion regulation strategy?” or “What variables need to be considered as part of the system when modeling emotion regulation?” have yet to be answered.

Such explorations could be theory guided, however, since Gross’s (2015) influential process model of emotion regulation is inherently dynamic and suggests hypotheses about temporal sequences, feedback loops, and attractor states that should characterize emotion regulation processes. For example, the theory posits a sequence whereby the need to regulate emotion is identified, followed by selecting a strategy, followed by implementing it (Gross, 2015). At that point, the world has been changed, due to the regulation effort, and the sequence can begin again with a decision about whether further regulation is necessary, and so on. A repeating sequence like this could be modeled with a network, where the paths are constrained to follow the specified order, to test the basic idea that emotion regulation typically occurs in this sequence. Feedback loops could be identified (e.g., some people may get stuck looping between deciding to regulate and deciding which strategy, thus not making it effectively to the implementation step) and external variables, such as psychopathology, could be introduced to test whether it interferes with particular steps in the sequence, or contributes to undesirable feedback loops, or generates other emergent behavior in the system.

Possibly the main barrier to this sort of work has been the mathematical and computational skills needed to develop and test DS theories, but methodologists have been making a concerted effort to help social science move past this barrier. If the reader is willing to invest in learning to use the R software platform for statistical modeling, the resources cited in this chapter provide an approachable basis for building and testing DS models with time-series data. Hopefully, by the time the next edition of this book comes out, it will be hard to choose what work to cite in a chapter like this.

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SECTION II

BIOLOGICAL BASES

CHAPTER 6

Autonomic and Somatic Aspects of Emotion Regulation

HEATHER L. URRY

Sixty years ago, Lazarus and colleagues (1962) demonstrated that, compared to watching a film about corn farming, watching a film showing a surgical procedure made hands sweat and hearts race; overall, there was “substantial evidence of a disturbed state” among participants (p. 27). Sounds awful. Had I been in this situation, I would have wanted to find a way to be less disturbed, to quell my bodily reactions. Would I have succeeded? The unsatisfying but intriguing answer is maybe.

In this chapter, I briefly describe how emotions are generated and regulated and offer a primer on the autonomic and somatic aspects of emotion. Focusing on lab-based experiments with unselected adults, I then review literature suggesting that implementing emotion regulation strategies has inconsistent bodily effects. I end with potential reasons for the inconsistency and suggest concrete directions for future research.

Emotion Generation and Regulation

Emotions are generated when something in the world or in our mind signals noteworthy happenings that may require action. More specifically, based on an integrative account across basic, appraisal, and constructionist perspectives, emotions arise from an appraisal system that mounts “a subjective analysis and evaluation of the eliciting stimulus/event/situation in terms of its consequences, implications, and action requirements” (Scherer, 2022, p. 164). The appraisal system “produces a synchronized effect on action tendencies and autonomic and somatic responses (including expressions)” (Scherer, 2022, pp. 164–165). Ultimately, changes in these components collectively produce feelings that can be categorized and labeled. Thus, in conjunction with action tendencies, autonomic and somatic responses are central components of emotion (see Figure 6.1).

The account of emotion generation described above has three noteworthy features. First, in part, motor expression is a consequence of physiological responses, and

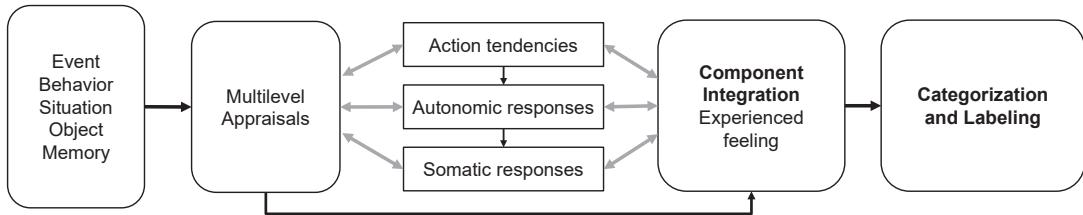


FIGURE 6.1. A process account of emotion generation (Scherer, 2022). Figure by Urry (2022); available at <https://doi.org/10.17605/OSF.IO/6N329> under a CC-BY4.0 license.

physiological responses are consequences of action tendencies. Thus, an urge to act potentiates autonomic and somatic responses. Second, the emotion-generation process has recursive elements (double-headed arrows in Figure 6.1); action tendencies and autonomic and somatic responses affect and are affected by appraisals and feelings. Third, this account is broadly consistent with the extended process model (EPM; Gross, 2015; see also Gross, this volume). In the EPM, emotions are generated by valuation systems in which events in the world (including within oneself) are perceived and evaluated in ways that produce emotion-related mental and/or physical actions; actions affect the world, thus fueling subsequent valuation cycles (see Figure 6.2a). The world–perception–valuation–action cycles afford opportunities for emotion regulation.

Emotion regulation refers to processes that monitor, evaluate, and modify the intensity and timing of emotional reactions (Thompson, 1994). According to the EPM, emotion regulation unfolds in identification, selection, and implementation stages. A goal to regulate emotions may form when one's actual emotional state deviates from the desired

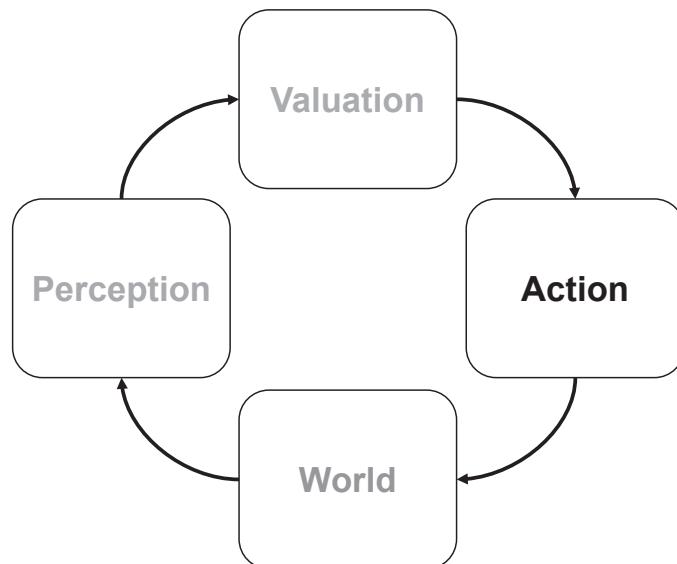


FIGURE 6.2A. First-level valuation system that generates emotion in the extended process model. From Urry (2022). Available at <https://doi.org/10.17605/OSF.IO/6N329> under a CC-BY4.0 license.

emotional state. In such situations, we can regulate our emotions by taking actions that alter the four elements of emotion generation. Specifically, after identifying a need to regulate, we can select and implement a plan to change the world, how we perceive and interpret it cognitively, and/or our emotion-related actions (see Figure 6.2b).

In Figure 6.3, I integrate Scherer's (2022) account of emotion generation with the EPM. Doing so makes clear that, if a plan to regulate emotions is implemented successfully, emotion-regulatory actions affecting one element of the emotion-generation process (e.g., looking away, a form of attentional deployment, or adopting an objective, third-person perspective, a form of cognitive change) should affect other elements (e.g., reduce the urge to withdraw and modulate physiology), including those mediated by the autonomic and somatic nervous systems.

Autonomic and Somatic Nervous Systems

Autonomic and somatic responses reflect the output of two divisions of the peripheral nervous system, both of which work in close coordination with the brain and spinal cord (see Kandel et al., 2021, for a comprehensive treatment). The autonomic nervous system (ANS) is responsible for sending signals to and receiving signals from body organs to

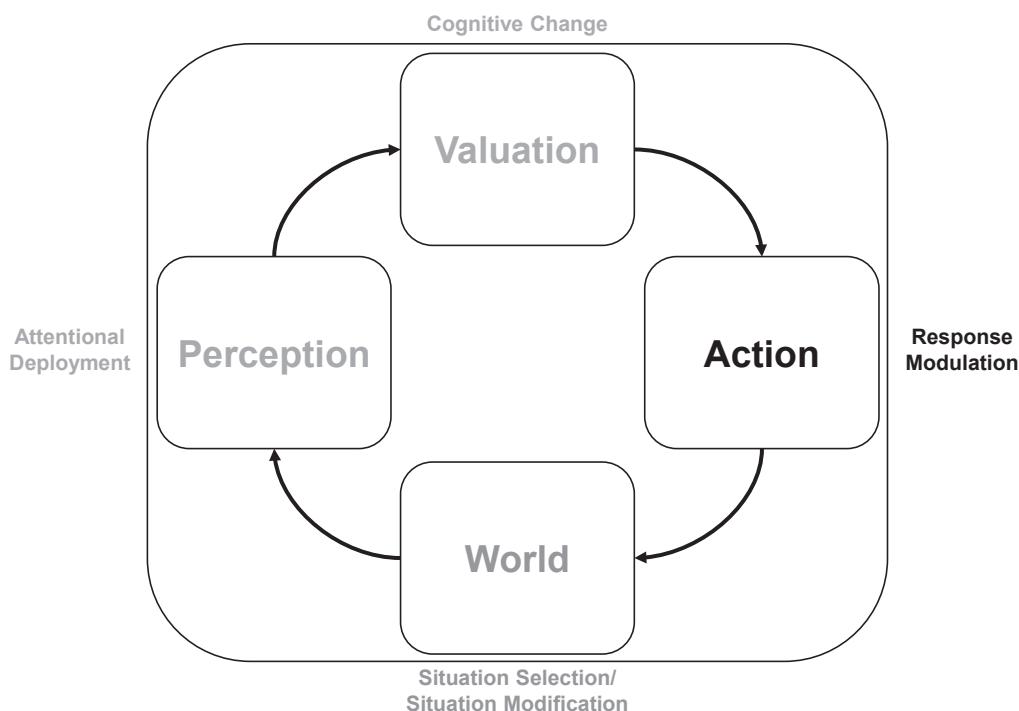


FIGURE 6.2B. Emotion-regulatory actions target elements of a first-level valuation system. Situation selection/modification alters the world, attentional deployment alters how we perceive the world, cognitive change alters how we interpret the world, and response modulation alters our emotion-related actions. Figure by Urry (2022); available at <https://doi.org/10.17605/OSF.IO/6N329> under a CC-BY4.0 license.

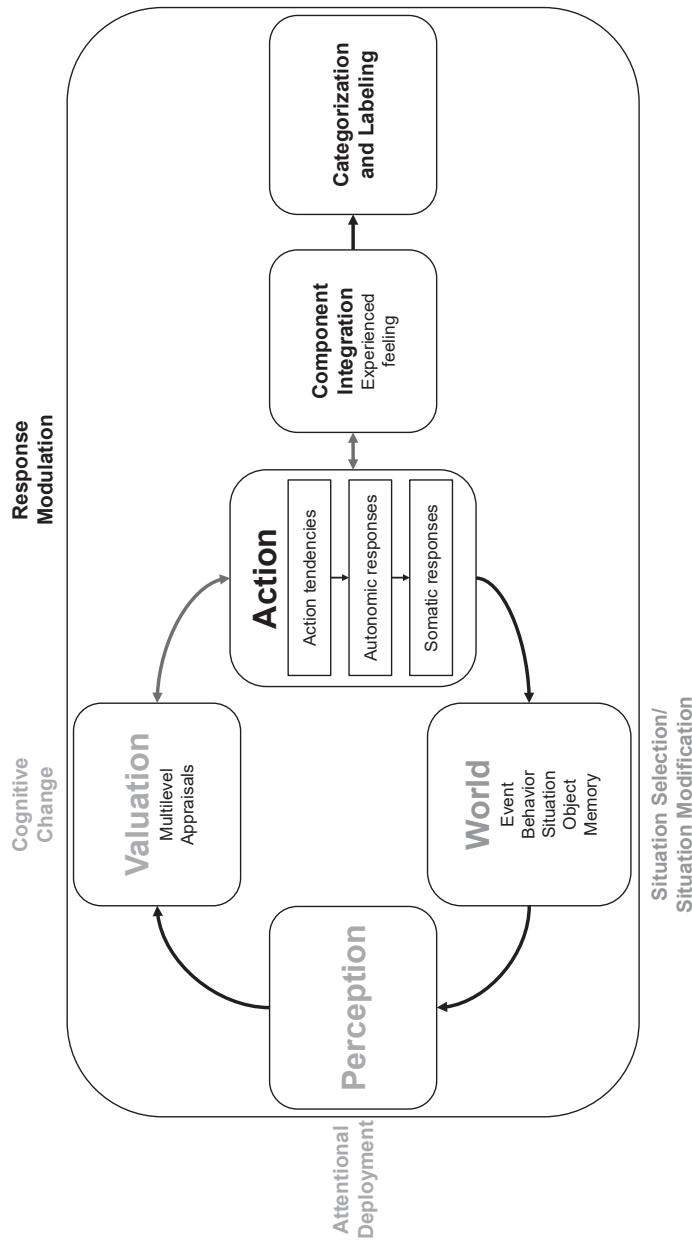


FIGURE 6.3. Integrating models. Based on Scherer's (2022) account, I have broken extended process model actions into three components, and separated those from experienced feelings, categorization, and verbal labeling. Figure by Urry (2022); available at <https://doi.org/10.17605/OSF.IO/6N329> under a CC-BY4.0 license.

help maintain homeostasis and make available the resources necessary for action. It has sympathetic and parasympathetic branches.

Sympathetic activation of the ANS can lead to alterations in target organs, such as an increase in heart rate to facilitate delivery of oxygen to the limbs, dilation of the pupils to facilitate vision, or relaxing the airways to increase oxygenation. Parasympathetic activation can lead to opposite alterations, such as a decrease in heart rate, and constriction of the pupils and airways. In psychophysiological studies of emotion regulation, common measures of ANS activity include heart rate, heart rate variability, blood pressure, skin conductance, pupillometry, and respiration (Zaehringer et al., 2020). These measures vary in the extent to which they reflect sympathetic and parasympathetic activation. For example, skin conductance is innervated by the sympathetic branch and heart rate is innervated by both.

The somatic nervous system controls voluntary and reflexive movements. It is responsible for receiving signals from the skin, muscles, and joints and sending signals to skeletal muscles. Activation of the somatic nervous system can lead to contraction of striated muscles and observable movements like laughing, running, bending, and frowning; it can also lead to muscle activation that is unobservable (Tassinary et al., 2016). In psychophysiological studies of emotion regulation, a common measure of somatic activity is facial electromyography (EMG) over the corrugator and zygomatic muscle regions (Zaehringer et al., 2020). Corrugator contraction draws the eyebrows down and together, and zygomatic contraction moves the cheeks up and back; facial EMG over these regions thus reveals valenced expressive actions, such as frowning and smiling, respectively.

Autonomic and Somatic Aspects of Emotion Regulation

All told, it appears that emotion-regulatory actions should be able to alter autonomic and somatic responses. And they sometimes do! Here I highlight my favorite empirical examples involving manipulation of two strategies, cognitive reappraisal and expressive suppression. Cognitive reappraisal means reinterpreting emotion-provoking situations to alter one's emotional responses (see Uusberg & Uusberg, this volume). Expressive suppression means masking outward display of emotion to alter one's emotional responses (see English, this volume). In the extended process model, reappraisal targets the way the world is interpreted; suppression targets emotion-related actions.

First, cognitive reappraisal. A couple of years after Lazarus and colleagues (1962) used a film depicting a surgical procedure to disturb participants, they paired that same film with varying narratives to manipulate how people thought about it (Speisman et al., 1964). The authors figured this might alter autonomic responses. Indeed, a narrative voice-over that downplayed threat and emphasized benefits of the surgical procedure or "presented a scientific attitude toward the ritual" (p. 368) reduced skin conductance responses at key points in the film. By contrast, a narrative that emphasized danger/harm increased skin conductance responses. Heart rate was unaffected. Thus, this study provided evidence that manipulating appraisals can alter autonomic, specifically sympathetic, physiology.

Other studies have documented physiological effects of cognitive reappraisal by cueing participants to generate and implement their own reappraisals. In a favorite example from my lab (Urry, 2010), we trained participants how to increase and decrease picture-induced negative emotions. They then viewed a set of negative and neutral pictures for several seconds apiece; each time a negative picture appeared, they viewed it freely for

a few seconds and then heard an instruction to increase, decrease, or continue viewing. (We also directed their gaze during picture presentation, but I'll skip discussion of that for brevity.) During the free-viewing period, negative pictures made heart rate decrease and corrugator activity increase compared to baseline. During the regulation period, increase reappraisals increased corrugator activity, skin conductance, and heart rate; decrease reappraisals decreased corrugator activity but affected neither of the autonomic measures. Thus, reappraisals can sometimes alter autonomic and somatic activity.

Now, expressive suppression. In my favorite studies of suppression (Gross & Levenson, 1993, 1997),¹ people watched a film clip (disgusting, amusing, sad) and followed the instruction to hide outward signs of emotion. In both reports, the authors compared several measures of autonomic and somatic responses during the instructional period to a baseline period. For the disgusting film, suppression led to smaller increases in facial expressive behavior, greater decreases in body movement and heart rate, greater increases in skin conductance, and greater decreases in finger pulse amplitude and finger pulse transit time (Gross & Levenson, 1993). For the amusing film, suppression led to decreased facial expressive behavior, smaller increases in somatic activity, decreased heart rate, and increased sympathetic activation of the cardiovascular system (Gross & Levenson, 1997). For the sad film, suppression led to decreased facial expressive behavior, smaller decreases in somatic activity, smaller decreases in skin conductance, larger increases in sympathetic activation of the cardiovascular system, and greater respiratory activation (Gross & Levenson, 1997). These studies suggest that hiding feelings can reduce expressive behavior and alter autonomic, especially sympathetic, physiology.

The cherry-picked studies above are just a few of many that have examined the autonomic and somatic effects of reappraisal and suppression. In fact, there have been enough studies now to permit meta-analysis. In one, Webb et al. (2012) meta-analyzed almost 200 studies to determine the effects of these (and other) strategies on the experiential, behavioral, and physiological aspects of emotional responding. Reappraisal had medium effects on experiential and behavioral outcomes and negligible effects on physiological outcomes. Expressive suppression had negligible effects on experiential outcomes, large effects on behavioral outcomes, and small effects on physiological outcomes. This meta-analysis was a tour de force, and a great service to the field. A downside of the approach, however, was the grouping of the physiological measures—including electromyographic measures of expressive behavior—into one bin.

In a second meta-analysis, Zaehringer and colleagues (2020) summarized the separable physiological effects of strategies to reduce negative emotions across 78 studies. Reappraisal had negligible effects on autonomic physiology, including finger pulse amplitude, finger pulse transit time, finger temperature, heart rate, heart rate variability, skin conductance level and responses, pupil diameter, and respiration amplitude. Moreover, just one effect was statistically significant; heart rate was slower for reappraisal compared to a control condition. On the somatic side, reappraisal reduced corrugator EMG a small amount. Suppression had small effects on a few measures of autonomic activity (finger temperature, mean arterial pressure, and respiration amplitude) but negligible or near-zero effects on many others (diastolic and systolic blood pressure, ear and finger pulse transit times, finger pulse amplitude, heart rate, heart rate variability, and skin

¹As a graduate student, I distinctly remember reading the 1997 study and rushing to my advisor, John Allen's, office with the hard-copy journal in hand. I waved it in his face through a crack in the door and declared with great excitement that this was what I wanted to study.

conductance level). There were insufficient studies to evaluate the effects of suppression on somatic responses.

Resolving the Inconsistency: Directions for Future Research

Emotion generation can prompt changes in action tendencies, autonomic physiology, somatic responses, and feelings. Conceptually, successful implementation of emotion regulation strategies should alter these components. Indeed, meta-analyses of cognitive reappraisal and expressive suppression suggest that these strategies alter somatic responses (mostly facial expressive behavior) and feelings to varying extents. Evidence for parallel effects of these strategies on autonomic physiology is underwhelming. What gives?

What gives, I think, is that variability is the rule rather than the exception. Both meta-analyses cited above revealed cross-study variability in emotion-regulatory effects, and both identified moderators of that cross-study variability. Because study was the unit of analysis, these (still very useful!) meta-analytic summaries cannot reveal to what extent there is autonomic and somatic variability across and within individuals. Even in experiments in which participant is the unit of analysis, potential variation in the effects of emotion regulation manipulations between and within people is typically treated as error. Future studies need to apply models that embrace variability. I am especially optimistic about approaches that allow for between- and within-person variability in associations between emotion components (e.g., Hoemann et al., 2020), and that adopt a psychometric network perspective (e.g., Lange et al., 2020). We must also consider variability across identification, selection, and implementation stages (e.g., Sheppes et al., 2015).

In addition, researchers often include one, maybe two, measures of autonomic physiology (e.g., heart rate and skin conductance; cf. Urry, 2010); peripheral nervous system function is, however, complicated. On the autonomic side, the sympathetic and parasympathetic systems can activate reciprocally (i.e., as one goes up, the other goes down), they can be coactive (i.e., both going up or down simultaneously), or they can be uncoupled (i.e., one going up with no change in the other; Berntson et al., 2016), and they rely on a variety of neurotransmitters and receptor subtypes (Lowell et al., 2021). Moreover, orienting, habituation, startle, defensive, and homeostatic responses (Stern et al., 2000) and different emotions (Levenson et al., 2016) have differing physiological effects. Finding the effects of emotion regulation on one or two autonomic physiological measures in the wake of these complications is essentially a crapshoot. Future studies should select multiple measures of sympathetic, parasympathetic, and somatic activation that fit the physical and mental requirements of the context and the emotions it engenders.

Finally, in experiments examining the autonomic and somatic effects of emotion regulation, we often ask people to view evocative pictures and films and then say, “Regulate . . . now!” In such tasks, the primary goal is to assess the success of emotion regulation strategies. Meta-analytic evidence suggests that this approach may be sufficient to observe changes in emotion experience and expressive behavior, but it might not be sufficient to observe changes in autonomic physiology. Emotions are generated about something in the world or in our head that may require action. If autonomic physiological responses support those possible actions (Lang & Bradley, 2010), and if action tendencies potentiate autonomic physiological changes followed by motor expression (Scherer, 2022), then situations that fail to motivate action may fail to mount autonomic responses

that can be altered by emotion regulation. Perhaps future work examining regulation-related changes in autonomic and somatic responses should focus on situations that push, or at least nudge, us to act.

Conclusion

We have known for nearly 60 years that altering the way we think about emotion-provoking situations can alter the way our bodies respond. Such effects are consistent with modern theories of emotion generation and regulation. However, effects of implementing emotion regulation strategies are inconsistent in lab-based experiments with unselected adults. In my view, we can resolve the inconsistency by taking variability seriously. Future research should adopt modeling techniques that quantify variability between and within persons, use a range of physiological measures, and study emotion regulation in lab contexts that prompt urges to act.

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CHAPTER 7

The Brain Bases of Emotion Regulation

EVIDENCE FROM FUNCTIONAL MAGNETIC RESONANCE IMAGING

KE BO
TOR D. WAGER

Understanding the brain bases of emotion regulation is essential to understand what we are doing, at a biological level, when we regulate emotion. Functional magnetic resonance imaging (fMRI) and related techniques can help us identify the key systems and neurochemicals involved, provide targets for tracking and comparing interventions, and help assess how emotion regulation converges with and diverges from other psychological, neurostimulation, and pharmacological interventions. A growing literature of about 250 studies documents the neural bases of emotion regulation using fMRI, which is our focus here. These studies compare brain and behavioral responses to affective (“feeling-inducing”) stimuli—typically aversive images, but sometimes food or drug cues, painful somatic stimulation, aversive sounds, or others—under different regulatory conditions. Participants are typically instructed to alter the intensity of emotional responses on some trials, and “respond naturally” on other trials. These conditions are compared to identify areas with activity increases during regulation, which are often taken as potential “mechanisms” or generators of new context, and decreases, which are potential affective “target regions” subject to regulatory control. The typical interpretation is that cortical regions activated during regulation form networks that jointly represent context and regulatory goals, which suppress activity in target-affective regions related to fear, anxiety, drug craving, and more.

The Neural Reference Space for Emotion Regulation

Multiple meta-analyses have identified a consistent set of regions involved in emotion regulation using this paradigm (Buhle et al., 2014; Dörfel et al., 2014; Kohn et al., 2014; Morawetz et al., 2017), along with variations by regulatory strategy (Dörfel et al., 2014; Morawetz et al., 2017) and differences between healthy controls and individuals with

mood and anxiety disorders (Picó-Pérez et al., 2017). We refer to this set of regions, which covers about 5% of brain gray matter, as the “neural reference space” for emotion regulation. This is shown in Figure 7.1A, which is based on a summary from neurosynth.org (Yarkoni et al., 2011) of the union of maps associated with the term *emotion regulation* (247 studies) and the term *reappraisal* (89 studies). This map includes all of the major areas that are consistently increased in activity during active regulation in meta-analyses, including ventrolateral prefrontal cortex (vlPFC), dorsolateral prefrontal cortex (dlPFC), ventromedial prefrontal cortex (vmPFC), dorsomedial prefrontal cortex (dmPFC), supplementary motor area (SMA) and pre-SMA, inferior parietal cortex (IPC), temporoparietal junction (TPJ), dorsal anterior cingulate cortex (dACC), posterior cingulate cortex (PCC), and lateral temporal cortex. It also includes the amygdala, the main potential “affective target” of emotion regulation, and several other subcortical potential targets related to affect generation, including the periaqueductal gray (PAG), superior colliculus, hypothalamus, nucleus accumbens/ventral striatum, and medial thalamus.

Which regions are suppressed during emotion regulation? The answer to this belies a simple story about “mechanisms” and “targets,” and suggests that alternative views are needed. The amygdala is the only consistently down-regulated region (Buhle et al., 2014), though even this finding is not consistent across studies and meta-analyses. Areas like the PAG and hypothalamus provide threat-related inputs to the amygdala, but they also receive projections from the amygdala that mediate behaviors—however, the PAG and hypothalamus are not consistently affected by emotion regulation, although they are reliably activated by affective stimuli (Kober et al., 2008; Reddan et al., 2018). What does this mean? One possibility is that the effects on affect-generating regions are specific to particular paradigms or strategies, are hard to measure using fMRI, and/or have not been appropriately identified in most previous studies. We believe this is part of the story—however, another possibility is that emotion regulation simply does not strongly modulate immediate affective impulses, and may instead work in different ways. Work on the brain bases of affect suggests that many of the same cortical areas involved in emotion regulation are also involved in emotion generation (Kober et al., 2008; Lindquist et al., 2012). These areas are, broadly speaking, involved in the appraisals that generate affect in the first place. Thus, there may be little separation between emotion-generation and regulation systems (Gross & Barrett, 2011; Ochsner & Gross, 2014).

Effects of Regulation Strategy

Different subsets of brain regions may also be recruited by different regulatory strategies, though there appears to be substantial overlap. The traditional way to conceptualize emotion generation and regulation alike is to decompose them into stages. States of emotion generation include (1) exposure to situations and events, (2) attention to affect-generating features, (3) appraisal of meaning for the self (i.e., assessment of current and future benefits and harms), and (4) emotional expression (i.e., facial expressions, behavior, and physiology; Ochsner & Gross, 2014). Correspondingly, emotion regulation encompasses strategies focused on altering each stage (Gross, 2011; McRae & Gross, 2020). One can alter the situation (“situation selection” and “situation modification”), the deployment of attention, the meaning assigned to stimuli and events (“cognitive reappraisal”), and alter the expression of emotions (“expressive suppression”).

Evidence points to both differences and commonalities in brain activity across regulatory strategies, and commonalities between reappraisal-based strategies and other

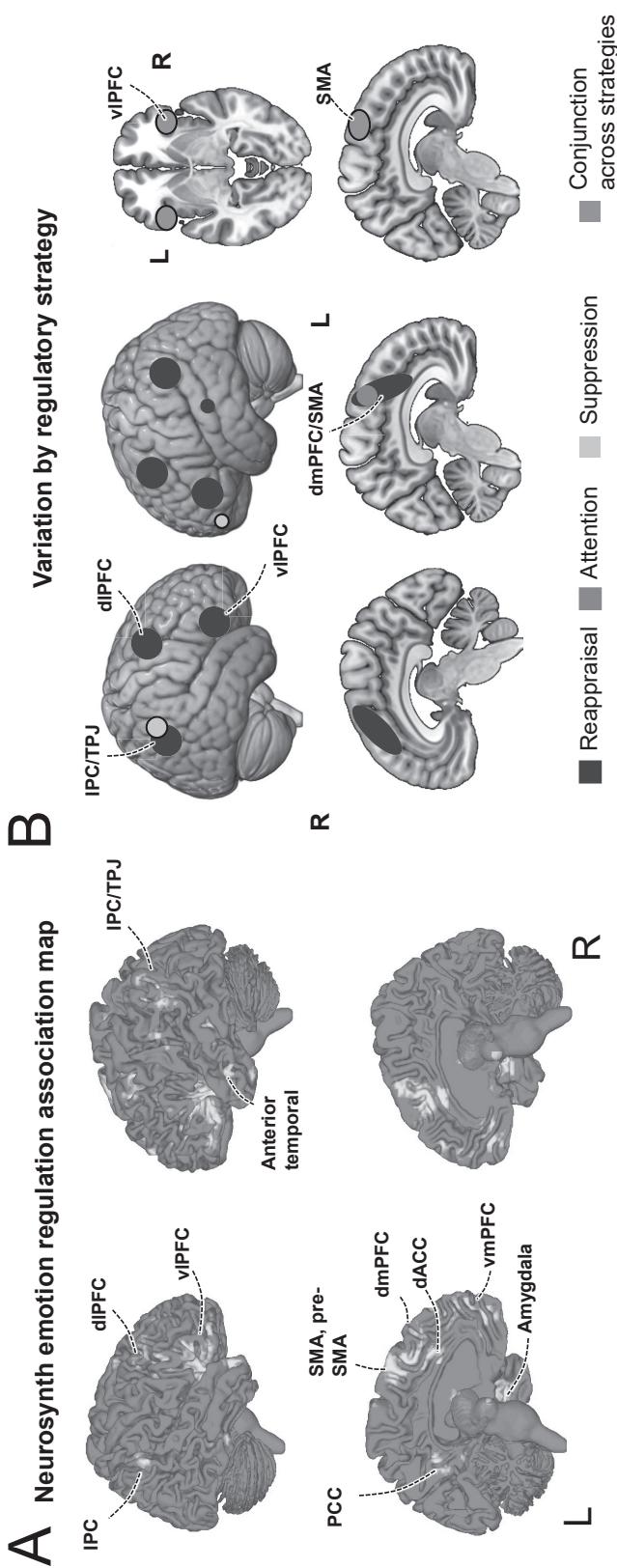


FIGURE 7.1. Key findings from meta-analyses of emotion regulation. (A) fMRI association map from neurosynth.org (Yarkoni et al., 2011) for studies matching the union of the terms *emotion regulation* and *reappraisal*. Associations do not separate activation from deactivation during regulation. Amygdala is the only region on the map consistently down-regulated across studies, though studies and meta-analyses vary on this point. (B) Meta-analysis for specific emotion regulation strategies, including reappraisal, suppression, and attention-related strategies (Morawetz et al., 2017). The figure is schematic and shows the rough locations of brain activation reported in Morawetz et al. vIPFC, frontal operculum, and SMA/pre-SMA were commonly activated across strategies. Reappraisal preferentially activated pre-SMA, dmPFC, dIPFC, IPC, and superior temporal gyrus. TPJ is activated in both reappraisal and suppression but not attention-related strategies. Note. IPC, inferior parietal cortex; dIPFC, dorsolateral prefrontal cortex; vIPFC, ventrolateral prefrontal cortex; TPJ, temporoparietal junction; PCC, posterior cingulate; dACC, dorsal anterior cingulate; dmPFC, dorsomedial prefrontal cortex; vmPFC, ventromedial prefrontal cortex; SMA, supplementary motor area.

manipulations of affective significance and meaning, including placebo effects and fear extinction. An early meta-analysis by Diekhof et al. (2011) suggested that vmPFC provides a common site for meaning change via cognitive reappraisal, placebo, and fear extinction. This finding was paralleled by studies identifying a pathway from vmPFC to nucleus accumbens mediating regulatory success, defined as stronger reductions in reported negative emotion (Wager et al., 2008) and pain (Woo et al., 2015). It also presaged later theories that focused on vmPFC as a hub for generating situation representations and assigning personal meaning across emotion, threat conditioning, substance use and craving, and cognitive domains (Koban et al., 2021).

Across regulatory strategies, a meta-analysis by Morawetz et al. (2017) identified vlPFC and nearby frontal operculum, and SMA/pre-SMA as consistently activated across reappraisal, attention, and suppression strategies (see Figure 7.1B). Activations were largely stimulus independent, demonstrating generalizability across stimulus types, and largely shared across up- and down-regulation goals. SMA is particularly interesting as a critical hub for willed action and volition, and vlPFC is a hub for selective attention to particular features and attributes of stimuli.

Meta-analyses have reported strategy differences, too, though it is unclear how robust these are across studies. In a meta-analysis from Picó-Pérez et al. (2017), activations in the left vlPFC and the left superior temporal gyrus were associated with reappraisal, whereas medial frontal and parietal activations (including angular gyrus) were associated with distancing strategies. These findings are consistent with some previous reports (Ochsner et al., 2012; Parkinson et al., 2014), including identification of a generalized distance representation in inferior parietal lobe (Parkinson et al., 2014). In a relatively rare direct comparison study, Dörfel et al. (2014) compared detachment (distancing), reinterpretation (reappraisal), expressive suppression, and distraction strategies. They identified common activation in dlPFC and IPC, and stronger activation of vlPFC and orbitofrontal cortex (OFC) during reappraisal. Interestingly, here, all strategies produced down-regulation of the amygdala except reappraisal. They suggest that reappraisal may rely on regions involved in information selection and semantic processing, whereas distancing is more related to brain areas linked to perspective taking and the sense of agency—however, Picó-Pérez et al. did not *directly* compare strategies. The meta-analysis of Morawetz et al. (2017) did this, and did not reveal any significant differences between strategies.

Overall, persistent challenges in mapping brain regions to strategies include the fact that it is difficult to precisely control and measure the strategy used, due to definitional and conceptual overlap among them, and because participants may not be fully aware or in control of what they are doing. Comparisons of strategy and goal (up-regulation vs. down-regulation) are potentially confounded with difficult-to-measure aspects of cognitive demand, arousal, regulatory success or efficacy, and physiological responses. Nonetheless, these studies have identified broad generalizability in the brain systems engaged during emotion regulation, and perhaps some hints that different strategies engage different systems.

Toward a New Framework for Understanding Emotion Generation and Regulation

While the current framework has afforded us a number of questions that can be addressed in the current paradigm, new models for how the brain works are providing us with new concepts and new questions. The stage model of emotion generation and regulation has high face validity and remains very useful, but there is an increasing understanding that

the brain does not simply operate on sensory input in a series of discrete, modular transformations. An alternative view is that the brain functions to construct a mental model of the world, constantly generating predictions about sensory input and updating the model to minimize prediction errors (den Ouden et al., 2010). The “world” includes the physical environment but also the hidden causal forces and conceptual relationships that govern our social interactions and communication. Our internal model or models include “cognitive maps” of everything from language to how the global economy works.

Applied to emotion and emotion regulation, the broad implication is that emotions—and perhaps even basic affective processes like pain and sensory pleasure—are *constructed* from multiple cognitive “ingredients” (Barrett & Russell, 2014). Attention, memory, appraisal, and action selection are not distinct processing stages but are present in every instance of affect generation. Emotion regulation modifies the mix of ingredients and how they are combined.

A new conceptual model based on constructionist principles is shown in Figure 7.2. Rather than stages, emotion begins with the integration of diverse inputs—chiefly exteroceptive (e.g., sights, tastes, sounds), interoceptive (e.g., pain and itch related, immunosurveillance), and mnemonic (e.g., episodic memories of past events and learned associations)—into a representation of the current “situation.” A situation is a latent state with causal power to affect our current and future well-being. For example, imagine you are alone, at night, in a run-down neighborhood in a foreign country, and approached by three men. This is a situation. That it has implications for well-being implies that its brain representation must incorporate the “self” as well—an estimate of its impact on our bodily integrity or our long-term capacity to maintain it and reproduce. We refer to this as a model of the “self in context” (Koban et al., 2021). Whether a situation is threatening or safe, and whether it affords fighting, fleeing, playing dead, or smooth talking, depends on our beliefs about the structure of the environment, and our capacity to respond. These assessments are “appraisals,” and the situation is really a set of interacting, mutually constraining beliefs.

This model incorporates three ideas that can be computationally explicit. First, the idea of minimization of prediction errors, or “surprise,” provides an explicit objective for the system. Predictions are passed back to exteroceptive and interoceptive input streams, which accomplishes two goals:

1. Inputs are biased toward expectations, increasing perceptual accuracy under noisy or ambiguous conditions.
2. Comparisons with input information generate prediction errors that serve to update the model.

Second, beliefs about the environment, the hidden causes of sensory input, and the self can be formulated in terms of probabilities, allowing their interactions to be understood and predicted using the rules of probability (i.e., Bayesian models; Friston, 2010). Third, the situation (i.e., set of beliefs) can be conceptualized as a *state* in the formal sense. A state is a location in a landscape (e.g., a simple one might be a maze with food in some locations and shocks in others). States are associated with actions, which shape movement from one state to other states. Each state is associated with several properties linked to emotion: (1) an overall expected reward and punishment, including discounted future ones, endowing states with valence—a key type of appraisal; (2) a set of possible actions, with reward and punishment values attached, providing a basis for motivated behavior and the perception of *control*—another key appraisal. Actions linked to a

strong expectation of reward or punishment avoidance confer a high sense of control and vigorous motivated behavior.

Where is the emotion in all of this? Emotions are properties of belief states. They emerge from the central situation model itself. *Jealousy* is what it feels like to believe that one's future rewards are devalued because others have relatively more. *Pride* is what it feels like to believe that one has done something that others admire, increasing social capital and expected future reward. Emotion labels like these are actually loose categories that we use to group and communicate about sets of roughly similar belief states, but there are nearly infinite shades and varieties.

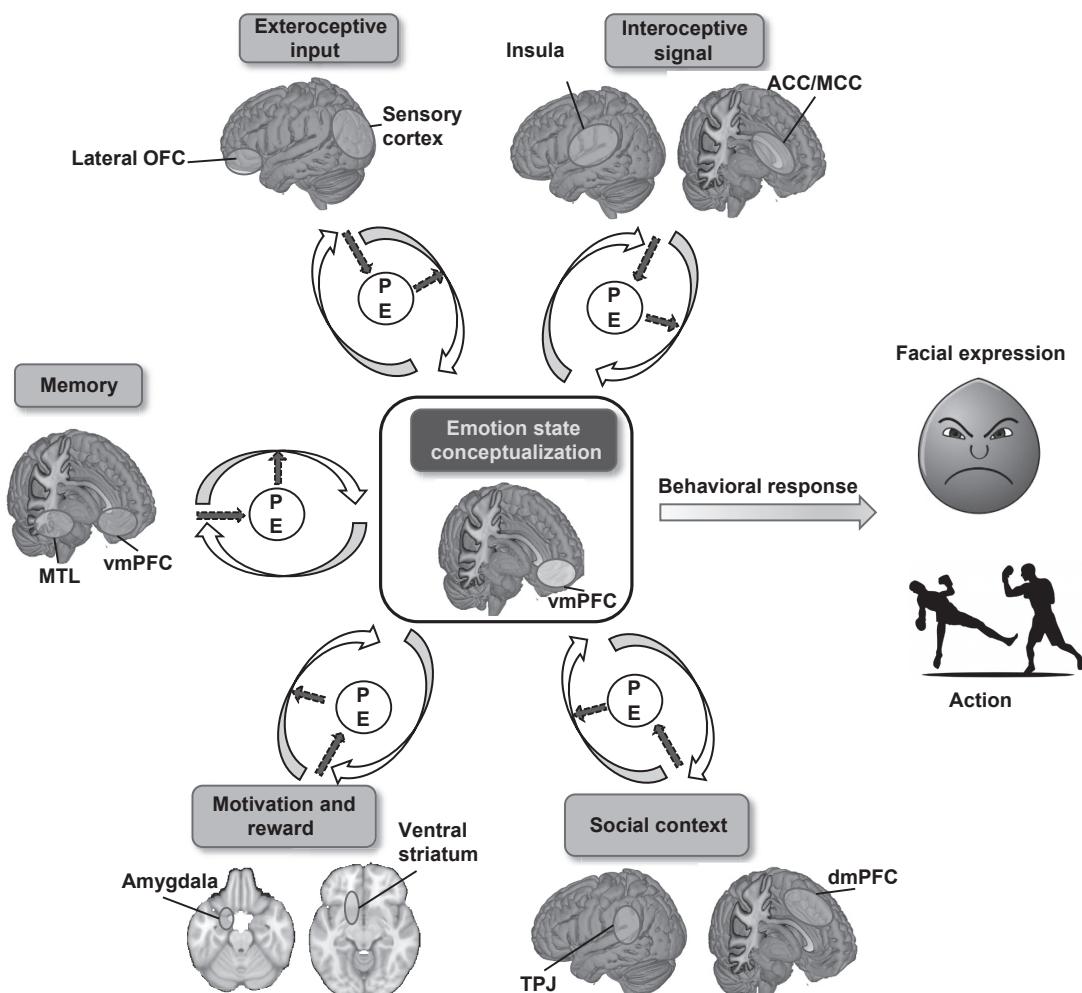


FIGURE 7.2. A schematic plot for the new framework. The model proposes that emotion begins with compressed various inputs into a representation of the current state. Explicit object for the system is to minimize prediction errors, which are generated by comparison between feedback prediction and input. Note. MTL, medial temporal lobe; OFC, orbitofrontal cortex; ACC/MCC, anterior/midcingulate; dmPFC, dorsomedial prefrontal cortex; vmPFC, ventromedial prefrontal cortex.

Where is the emotion regulation in this model? Emotion regulation is the alteration of belief states by bringing new information to bear. It may be as complex as decision making itself. Regulatory goals can alter the prior beliefs about the situation and one's capacities, or the way evidence is integrated and weighted (e.g., via attention) to update beliefs.

The Achilles' heel of constructionist models has been that they embrace complexity but make relatively few specific, testable predictions. Future work will continue to refine this framework. For the present, it makes several broad predictions that differ from the status quo. First, there is no fundamental distinction between emotion generation and regulation. There may be distinct regions activated during regulation that process goals and intentions, but emotion generation and regulation are both emergent properties of central conceptual models. The meta-analyses discussed above broadly support this proposition. Second, the areas most strongly related to emotion are most similar to those involved in relational meaning. A circuit including the vmPFC, posterior cingulate, and posterior TPJ (all roughly belonging to the "default mode network") fits this description well. It is central in meta-analyses of emotion (Hiser & Koenigs, 2018), semantics (Binder et al., 2009), episodic memory (Spreng et al., 2009), and studies of conceptual meaning, including placebo effects (Wager & Atlas, 2015). Third, affect and emotion may be integrated with sensory processes more deeply than previously understood. There is no sharp division between "perceptual," "decision," and "affective" brain regions, as predictions from central models with affective/motivational properties are integrated and compared with sensory (exteroceptive and interoceptive) in perceptual pathways. A variety of work bears this out. Specific types of negative affect appear to be encoded in particular subcortical–cortical perceptual pathways (Bo et al., 2021; Kragel et al., 2021; Čeko et al., 2022). Visual cortex discriminates at least five types of emotion categories from one another (Kragel et al., 2019). Placebo effects appear to influence somatic sensory processing in the spinal cord (Tinnermann et al., 2017).

A final prediction is that integration of interoceptive information may be key in distinguishing affective from other cognitive processes (Barrett & Simmons, 2015; Kleckner et al., 2017). Not all "cognitive maps" are endowed with affective "color" and motivational urgency. Those that are, particularly the vmPFC, are also deeply connected with interoceptive systems, as well as being centrally involved in tasks that relate concepts and stimuli to "the self" (Denny et al., 2012). At some level, the body is the self, and the bearing of events on what happens within it may ultimately be the key to what makes them salient and urgent enough to create feelings and motivation to act.

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CHAPTER 8

Brain Bases of Emotion Regulation

THE LATE POSITIVE POTENTIAL

ANNA WEINBERG
JUHYUN PARK

What emotions are and how they come to be has long been a subject of fascination. Aristotle (ca. 350 B.C.E./1999) argued that emotions are fateful events, noting, “In respect of the passions, we are said to be moved” (1106a4-5), a perspective that endures in the metaphors we use today (e.g., we are “seized” by terror/dread/desire). Yet decades of work in the psychological sciences have established a fundamental, but perhaps counterintuitive, fact: Emotions are not experiences that happen *to* us but instead are dynamic and iterative processes that we construct over time. Environmental input has a role in emotions of course, but our responses to those inputs are also determined by our prior experiences, values, expectations, and our appraisals. Moreover, these emotional responses change rapidly over time, and can be adjusted at multiple points (e.g., Gross, this volume).

Event-related potentials (ERPs) are an ideal measure for investigations into neural correlates of these dynamic emotional processes. ERPs are derived from the ongoing electroencephalogram (EEG), a measure of the brain’s fluctuating electrical activity recorded from sensors fixed to the scalp. Because electricity moves at virtually the speed of light, activity captured by sensors on the scalp is nearly instantaneous with the underlying neural response. ERPs, therefore, can identify distinct cognitive-affective processes with millisecond precision and track changes in these processes in real time.

ERPs are defined by voltage fluctuations in the EEG that are time locked to specific events (e.g., a stimulus onset, generation of motor response). For a comprehensive overview of ERP components used to measure emotional response and emotion regulation, we refer readers to MacNamara et al. (2022). This chapter focuses primarily on the late positive potential (LPP) and work that has used the LPP to examine two steps identified in Gross’s (this volume) process model of emotion regulation: attentional deployment and cognitive change.

The Late Positive Potential

The LPP is a sustained slow-wave ERP component that becomes evident 300 or 400 ms following the appearance of emotional stimuli, and is generated by multiple brain regions working together to direct and sustain attention to motivationally salient visual information (Weinberg et al., 2013). The LPP is enhanced to *both* pleasant and unpleasant, relative to neutral, content; images depicting biologically salient themes of survival, reproduction, and affiliation (e.g., threat and erotic images) tend to elicit the largest LPP, whereas images depicting neutral objects (e.g., a clock face) tend to elicit the smallest LPP (Weinberg & Hajcak, 2010). The LPP can also persist for several seconds—even after the image is no longer visible (e.g., Hajcak & Olvet, 2008), and is thought to track flexible attention to emotional content, in that it can measure shifting attentional patterns (e.g., Weinberg et al., 2013). These characteristics render the LPP particularly useful in emotion regulation investigations, as the LPP is sensitive to manipulations that can *alter* the salience of a stimulus, and the temporal precision of the measure allows us to track these changes in real time. Figure 8.1a depicts the procedure used to elicit and record the LPP; Figure 8.1b, the LPP in response to unpleasant, neutral, and pleasant images; and 8.1c, a scalp distribution showing its centro-parietal location on the scalp as a difference between emotional and neutral images.

The LPP and Emotion Regulation

Attentional Deployment and the LPP

Attentional deployment refers to a family of emotion regulation strategies that shift one's attention to modify emotional response (e.g., distraction; Gross, this volume). Indeed, several elegant studies have shown that manipulations that direct visual attention either toward or away from the most emotionally salient portions of emotional images can influence the LPP (e.g., Dunning & Hajcak, 2009; Hajcak et al., 2009; Schindler et al., 2022). For instance, some studies show participants distressing images (e.g., a half-buried child victim of a massacre), and ask them to simply view the pictures. After some time, a cue appears on the screen, indicating that a participant should look at either a more distressing portion of the image (e.g., the dead child's face), or a less distressing portion of the image (e.g., pebbles in the dirt). On trials where participants look at less distressing portions, the LPP is decreased (e.g., Dunning & Hajcak, 2009). Similar effects are observed when participants make nonemotional judgments about emotional pictures (e.g., the orientation of overlaid lines; Schindler et al., 2022). These online effects can even be observed when participants focus their attention on a less distressing part of images that are remembered but not seen (Thiruchselvam et al., 2011). Combined, these studies demonstrate that the LPP is useful for tracking attentional deployment as a means of regulating emotional response.

Cognitive Change and the LPP

A second approach to altering one's emotional response involves changing the *meaning* of a stimulus (e.g., Gross, this volume). Techniques that alter how images are appraised are examples of this—and a substantial body of LPP research has focused on neural correlates of appraisal and reappraisal. In this work, appraisals can be modified prior to the presentation of a potentially distressing stimulus (preappraisal), or after the stimulus has already been encountered and an emotional response has been initiated (reappraisal).

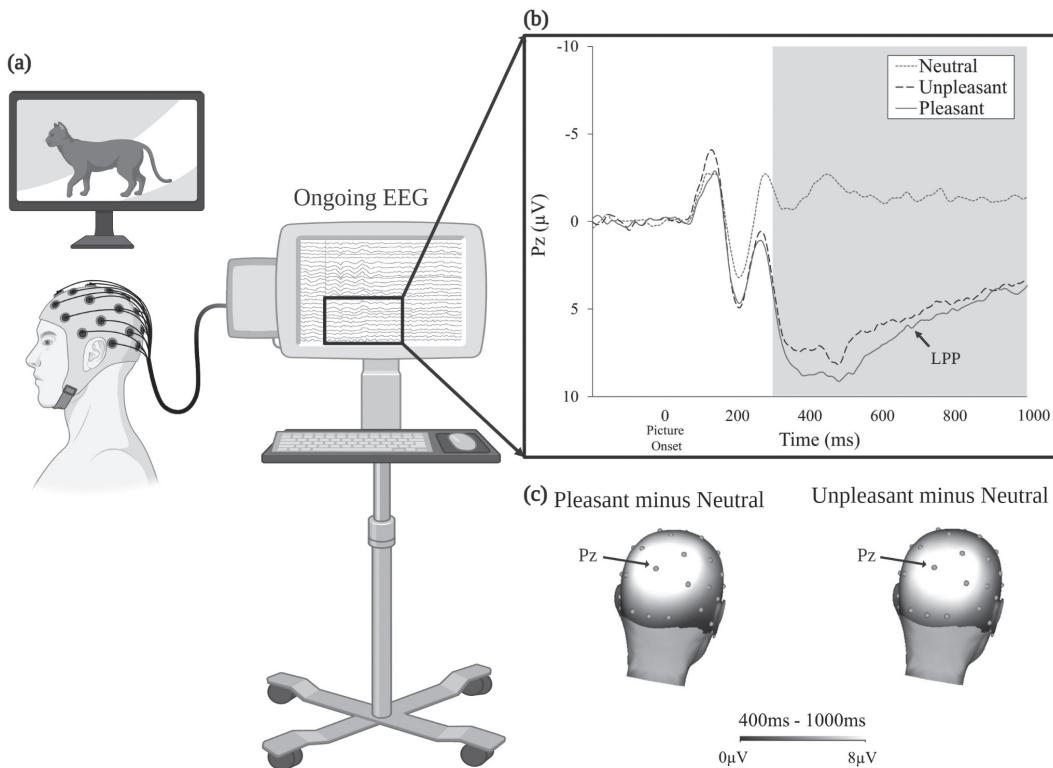


FIGURE 8.1. Illustration of the late positive potential (LPP), an event-related potential (ERP) elicited following presentations of neutral, unpleasant, and pleasant images. Per ERP convention, positive voltage is plotted down. The illustration in (a) depicts how the LPP can be elicited using a passive viewing paradigm in which participants simply view pleasant, neutral, and unpleasant images presented on a screen. While viewing these pictures, participants are wearing a cap with electroencephalograph (EEG) sensors attached, and continuous raw EEG is recorded. ERPs are then extracted from the raw EEG. An ERP waveform typically represents the average of the brain response measured across multiple trials in different conditions—for example, participants might view 30 pleasant images, 30 neutral images, and 30 unpleasant images. Separate average ERP waveforms for each condition would be obtained. Specific ERP components are then identified in the overall waveform—often, a peak deflection in the waveform—that captures the brain response (or set of responses) of interest. ERPs are typically described in terms of their amplitude, or size (measured in microvolts [μ V]); polarity (positive or negative); latency, or timing (measured in milliseconds [ms]); and scalp topography (where on the scalp the component is maximal). Naming conventions tend to reflect both the polarity and latency of the component. The LPP, then, is a *relatively* late (in the world of ERPs, this means the component emerges more than 300 ms following presentation of a picture) positive-going deflection in the ERP waveform that appears after a stimulus is presented. The graph in (b) shows average ERP waveforms in a sample of 100 participants. Separate waveforms are shown for average neural responses to neutral, unpleasant, and pleasant images. Time is shown on the x-axis (0 ms is the time when the images were presented on the screen), and the amplitude of the component recorded at electrode site Pz is depicted on the y-axis. The LPP is labeled in the waveform, and is larger (more positive) for pleasant and unpleasant compared to neutral images. The images in (c) show the scalp distributions of the difference between neural responses to pleasant and neutral images and the difference between neural responses to unpleasant and neutral images, between 400 ms and 1,000 ms following image onset. The LPP is maximal at centro-parietal sites on the scalp (e.g., Pz), as indicated by the areas of white. Figure created with BioRender.com.

In one of the first studies measuring the effect of cognitive change using the LPP, participants were taught reappraisal before viewing pictures (e.g., think to yourself that a man holding a gun to his head decides *not* to attempt suicide; Hajcak & Nieuwenhuis, 2006). Next, participants viewed highly unpleasant images, and either “reinterpreted” the images, as instructed, or “attended” to the images (or focused on their natural response to the pictures). Unpleasant pictures viewed in the reappraise condition elicited a smaller LPP than those in the attend condition—and the degree of reduction in the LPP was associated with participants’ self-reported feelings about the pictures in the reappraise condition. Figure 8.2 shows an example of the effect of reappraisal on the LPP. Multiple studies have since replicated this effect, both with reappraisals generated by participants (e.g., Moser et al., 2006), and instructed preappraisals, in which participants were given negative or neutral descriptions of pictures prior to viewing them (e.g., MacNamara et al., 2009). Recent evidence has even suggested that reappraisal of unpleasant images from a category (e.g., pictures of guns) generalizes to never-reappraised stimuli from the same category (i.e., new pictures of guns), in that these novel stimuli also elicit a smaller LPP (Bautista et al., 2022).

These studies suggest that the effects of pre- and reappraisal can be reliably measured using the LPP—however, pre- and reappraisal are often more effortful and less accessible than other emotion regulation strategies. Studies have therefore capitalized on the temporal precision of the LPP as a measure to compare the time course and duration of reappraisal to that of less costly strategies. Typically, reappraisal is slower (by approximately 300–400 ms) to reduce the magnitude of the LPP than expressive suppression (i.e., inhibition of the expression of emotion) or distraction (e.g., Paul et al., 2013)—however, the longer-term effects of reappraisal appear more durable: previously viewed images under a distraction condition elicit a *larger* LPP on a later uninstructed viewing (e.g., Thiruchselvam et al., 2011), whereas previously reappraised images elicit a

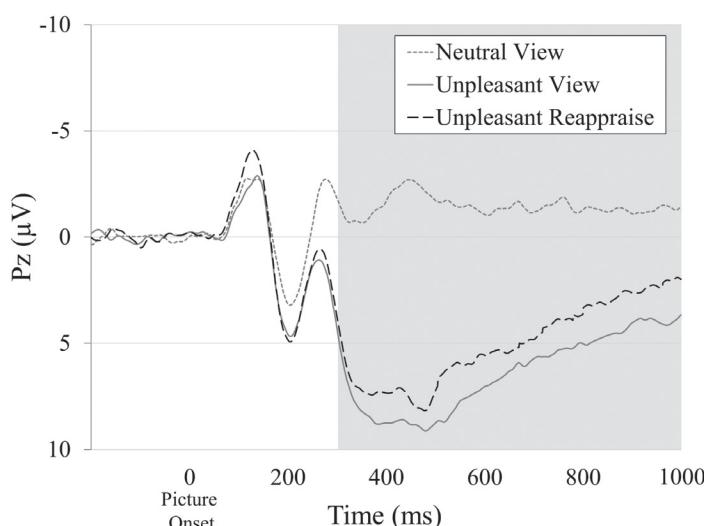


FIGURE 8.2. Simulated grand averaged event-related potentials (ERPs) at electrode site Pz elicited by neutral pictures (dashed gray line) and unpleasant pictures that were associated with either an instruction to simply view (solid gray line) or reappraise (dashed black line) the image. As shown, the late positive potential (LPP) is smaller (i.e., less positive) following reappraisal instructions.

smaller LPP (MacNamara et al., 2011; Thiruchselvam et al., 2011). These studies suggest (1) distraction and reappraisal work on different (albeit subtly different) timescales, and (2) distraction may be effective only in the short term, whereas reappraisal may have a more enduring effect on an individual's experience with unpleasant stimuli.

Future Directions

Consistent with the long-standing focus of the emotion regulation field, this review has focused on how the LPP can measure the effects of emotion regulation on neural responses to unpleasant images—however, the ability to cultivate and sustain positive emotions is also critically important for health and well-being. Emotion regulation researchers are therefore increasingly identifying and refining techniques that can appropriately amplify positive emotions (Quoidbach et al., 2015). Research using the LPP to measure up-regulation of positive emotions has yielded mixed results. In some studies, appraisal approaches to up-regulate responses to pleasant pictures did *not* result in a larger LPP (e.g., Krompinger et al., 2008). Further, one study reported that participants' LPP to pleasant pictures was *smaller* in a positive preappraisal condition (Peng et al., 2013). These findings suggest that the mechanisms needed to enhance positive emotions may be different from those used to decrease negative ones.

Still, there is support for the expected modulation of the LPP in positive emotion regulation: When participants are allowed to freely select strategies to increase their response to pleasant images, their LPP is also increased (e.g., Baur et al., 2015). Moreover, Wilson and MacNamara (2021) recently found that savoring, or sustained attention to positive aspects of the present moment, increased participants' reports of their enjoyment of pleasant images, as well as the LPP. When participants viewed the same savored images 30 minutes later, they still showed this enhanced LPP, suggesting that savoring has at least a medium-term effect on participants' experiences with these images.

This work points to promising new directions for improving affective outcomes via increasing attention to positive content—however, it is also possible to dial positive emotions up too high, with adverse results (e.g., Johnson, 2005). Emerging research indicates that reappraisal, expressive suppression, and distraction can all result in a smaller LPP to high-intensity positive pictures (e.g., Li et al., 2020; Shafir et al., 2018). Combined, existing evidence suggests that the LPP can be useful for tracking flexible approaches to regulating positive emotions. Still, more research is necessary to better understand the common and distinct neural processes involved in regulating positive and negative emotions.

Additionally, most experimental work examining neural correlates of emotion regulation has limited generalizability. For instance, this research has largely focused on one or two emotion regulation strategies. Yet it is increasingly clear that people can, and often should, use more than one strategy to regulate their emotions, sometimes simultaneously (e.g., Ford et al., 2019), prompting investigations into *flexibility* in the use of multiple emotion regulation strategies (e.g., Aldao et al., 2015). Initial evidence suggests that the LPP may be useful in this line of inquiry. For example, Myruski and colleagues (2019) examined changes in the LPP following multiple emotion-regulatory instructions (e.g., enhance vs. suppress one's emotional responses), and found that greater changes in the LPP across different instructions were associated with greater self-reported ability to flexibly shift between strategies. Additionally, emotion regulation in everyday life differs from what participants do in the lab. Promising new research has shown that the LPP

may help to track regulation when people are cued to think about their own emotional memories (Speed et al., 2020). Future work, potentially utilizing mobile EEG technologies, might build on this work to assess emotion regulation flexibility with more precision and ecological validity.

Furthermore, there are individual differences in the traits and skills that allow people to regulate their emotional responses. Understanding these individual differences is as important as understanding the different strategies individuals use. For example, individuals who have trouble clearly identifying, accepting, and/or tolerating their emotions are more likely to use unhelpful regulatory strategies and fail to successfully modify their emotions (e.g., Park & Naragon-Gainey, 2019, in preparation)—however, it is not clear how these individual differences are associated with variation in ERP components. Future work should identify these neural correlates to develop a more complete picture of adaptive emotion regulation and identify crucial targets for psychological intervention.

The data discussed above highlight how some of the unique strengths of the ERP method—its temporal precision and its ability to reflect communication between multiple regions of the brain—can enhance emotion regulation research. Much less is known about the specific brain structures accountable for the modulation of the LPP during emotion regulation. Thus, future ERP research should consider also incorporating methods with high spatial resolution (e.g., functional magnetic resonance imaging [fMRI]) to localize the source of different ERPs. Finally, as this field of study approaches its third decade of life, it will be critical to identify ways in which research using ERP methodologies can move beyond static laboratory settings to understand how we regulate more intense and more personal emotional experiences in our daily lives, how and when we select the strategies we use, and how and for whom these strategies succeed. These advances are necessary to fully answer the question of when and how people construct, and reconstruct, their emotional experiences.

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CHAPTER 9

Emotion Regulation

RESEARCH WITH NEUROLOGICAL PATIENTS

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Over the past 20 years, my laboratory has studied over 600 neurological patients, focusing on emotional reactivity (generating emotional responses), regulation (adjusting emotional responses), and recognition (identifying and responding to emotions in others). We have utilized methods derived from contemporary affective science (Levenson, 2007), including (1) standardized tasks for assessing actual emotional functioning; (2) solitary and dyadic paradigms; (3) experimental and observational research designs; and (4) multimethod assessment incorporating subjective experience, expressive behavior, peripheral physiology, and emotional language.

In this chapter, I draw on these experiences to highlight challenges and opportunities, present illustrative findings, and discuss promising directions related to using neurological patients to study emotion regulation. For readers interested in more traditional literature reviews, there are several to choose from (e.g., Beer & Lombardo, 2007; Turnbull & Salas, 2021).

General Considerations

Lesions and Neurodegeneration

Neurological patients can be divided into two broad categories: (1) lesions—acute, relatively focal brain damage caused by disease (e.g., strokes), injury (e.g., errant tampering irons), and surgical procedures (tumor resection); and (2) neurodegeneration—progressive, relatively diffuse brain damage caused by disorders, such as dementia. Because of the high prevalence of neurodegenerative diseases (e.g., Alzheimer's disease [AD] affects approximately 6.5 million people in the United States alone; Alzheimer's Association, 2022), research is no longer limited to single-case and small-*N* studies, but

can have large, adequately powered samples (e.g., 276 neurological patients in a recent laboratory study of emotional reactivity; Chen et al., 2022). Even with lesions, researchers may have access to moderately sized research samples (e.g., 30 patients with focal lesions in a study of empathy; Shamay-Tsoory et al., 2009).

Correlational and Experimental Research Designs

Most human-affective neuroscience is correlational, examining associations between a noninvasive measure of brain activity (typically obtained via electroencephalography [EEG], magnetoencephalography [MEG], or functional magnetic resonance imaging [fMRI]) and an assay of emotional behavior. While helping illuminate brain–behavior associations, these correlational studies are not definitive in establishing either the necessity or sufficiency of different brain regions for supporting emotion regulation or other aspects of emotional functioning.

In contrast, research with neurological patients can provide stronger support for the “necessity” and “sufficiency” of certain brain structures for maintaining different aspects of emotional functioning. For example, the Phineas Gage case study (Harlow, 1848) is often cited as supporting the necessity of the frontal lobes for emotion regulation.

Challenges: Characterizing Brain Injuries

Clinical Observations

Before magnetic resonance imaging (MRI) and other neuroimaging methods became readily available, neurological patients were characterized via neurological exam (e.g., reflexes, tonus), neuropsychological testing (e.g., memory, executive functioning), and clinical histories (e.g., first-appearing symptoms, changes over time). In the hands of a skilled diagnostician, these data can be used to infer the likely location of possible brain injuries, often with remarkable accuracy.

This clinical approach is not without problems. For example, in the Phineas Gage case study, visual observation and probing of the wound caused by an errant tamping iron led to a description of the areas of brain injury (Harlow, 1848, 1868) that differed in important ways from later descriptions derived from examinations of the skull conducted using modern neuroimaging and statistical techniques (Damasio et al., 1994; Ratiu et al., 2004).

Structural Approaches

In contemporary affective science, brain injuries are often characterized using structural imaging. Structural MRI scans, akin to those commonly used for medical diagnoses, can be processed using powerful software tools (e.g., Ashburner & Friston, 2000; Dale et al., 1999) to measure volumes of brain regions of interest and track changes over time. Whereas structural scans from 1.5-Tesla clinical scanners were typically used in earlier work, most modern research imaging centers now have 3.0-Tesla or higher-resolution scanners that allow for even finer-grained volumetric analyses (e.g., enabling parcellation of insula subregions).

Other noninvasive methods can also be used to characterize brain injuries. For example, positron emission tomography (PET) can be combined with certain injected chemicals (ligands) to assess the accumulation of different proteins that are involved in

neurodegeneration (e.g., beta-amyloid, tau) in different parts of the brain. Finally, neurological patients may give permission for their brain and spinal cord to be studied after death (Spina et al., 2015), which can reveal more detailed information about the extent and location of structural damage, and, in the case of neurodegenerative disease, the particular proteins found in neuronal inclusions.

Functional Approaches

Noninvasive measures of brain activity such as those based on EEG, MEG, or the blood-oxygen-level-dependent (BOLD) signal in fMRI that are commonly used with healthy individuals can also be used with neurological patients. However, the latter comes with the obvious caveat that brain cells that are no longer present cannot contribute to signals used in these functional measures. Thus, using these measures of brain activity with neurological patients requires great care in the design of studies and the analysis and interpretation of data.

Regions, Circuits, and Networks

Although brain injuries are often characterized in terms of volume loss in particular parts of the brain, modern affective neuroscience goes beyond “neo-phrenology.” Thus, complex behaviors, such as emotion regulation, are viewed as being subserved by multiple brain structures linked in complex and often widely distributed networks (e.g., salience and executive control networks; Seeley et al., 2007, 2009). Challenges in characterizing brain injuries in terms of network integrity have led many researchers to move to a multimodal imaging approach (Grossman, 2015). For example, volumetric data (from structural MRIs) can be combined with measures of protein accumulation (from PET ligands; Klunk et al., 2004), integrity of major white matter tracts (from diffusion tensor imaging; Caseras et al., 2015), and correlations of spontaneous brain activity from different brain regions (from resting-state fMRI; Rey et al., 2016) to estimate the integrity of different brain networks.

We (Chen et al., 2022) recently utilized two kinds of neuroimaging to study preparatory peripheral physiological responding to impending emotional events (physiological adjustments thought to provide metabolic support for possible future action). Structural MRIs revealed that smaller preparatory responses were associated with smaller volumes in the ventromedial prefrontal cortex, right anterior insula, and left ventral anterior insula. Resting-state fMRIs revealed that smaller preparatory responses were also associated with lower functional connectivity in a circuit that included the ventromedial prefrontal cortex and cortical and subcortical regions of the salience network. Together these two imaging modalities provided a more detailed picture of the brain circuitry associated with this important aspect of emotional functioning.

Premorbid Individual Differences and the Effects of Time

Most research with neurological patients is based on a snapshot taken at a particular point in time, often close to the time of injury and/or initial diagnosis. Not knowing whether a person was a skilled emotion regulator prior to a brain injury can complicate evaluating the meaning of a deficit in this ability observed after the injury. When formal premorbid test data are not available, estimates of premorbid functioning can be

obtained from informants (we have found familial reports of patients' emotional functioning to have both discriminant and predicative validity; Brown et al., 2020; M. C. Otero & Levenson, 2019).

Time is also important in the postmortem period. Neurodegenerative diseases are progressive and thus the extent of brain injury and associated deficits in functioning become greater over time. Focal lesions change as part of the natural healing process and associated behavioral deficits may also change for a host of reasons (e.g., recruitment of alternative neural pathways, effects of rehabilitative treatments, changes in patient motivation levels). Because of these changes, assessments of brain injury and emotion regulation should be done as close in time as possible.

Finally, repeated longitudinal assessments of brain injuries and emotion regulation can reveal important temporal relationships involving *changes* in both (e.g., lead/lag relationships, longitudinal mediation analyses). I am not aware of published research on emotional regulation that uses this methodology—however, our research group is now collecting these kinds of data.

A Comment on Diagnosis

Clinical diagnosis is often used to designate patient groups with presumably different patterns of brain injury. For example, we (Goodkind et al., 2010) found moderate deficits in the ability to suppress emotional expression in patients with AD and more profound and pervasive deficits in patients with frontotemporal lobar degeneration (FTD) compared to healthy controls. It is tempting to explain these diagnostic group differences in terms of presumed anatomical differences (e.g., patients with FTD have greater damage to frontal brain regions critical for emotion regulation than patients with AD)—however, inferential leaps from clinical diagnoses to suppositions about unmeasured brain injuries must be tempered by factors such as possible misdiagnosis, anatomical heterogeneity within diagnoses, and increasing diffuseness of neurodegeneration over time.

Challenges: Characterizing Emotion Regulation

Characterizing emotion regulation in studies with neurological patients requires precise measurement and careful use of terminology. In more clinical literatures, “emotion regulation/dysregulation” terminology is often used to describe a wide swath of emotional processes that are quantified using measures of clinical symptomatology (e.g., depression and anxiety scales). To build a programmatic and replicable neuroscience of emotion regulation, it is critical to avoid comparing apples with oranges. In the service of this goal, we (Levenson, 2013; Levenson et al., 2013) have pointed to important distinctions among (1) instructed (what people “can do”) and spontaneous (what people “do do”) emotion regulation, (2) down- and up-regulation, (3) regulation of negative and positive emotion, (4) targets of regulation (e.g., subjective experience, behavior, physiology), (5) types of emotion regulation (e.g., situation selection, situation modification, attention, cognitive change, response modulation; Gross, 1998), (6) solitary and interpersonal regulation, and (7) sources of data (e.g., laboratory assessments, self- and other-reports).

To determine whether these distinctions are associated with different neural circuitry requires appropriate research designs. For example, we and others have conducted studies of emotion regulation using neurological patients that include both (1) up- and

down-regulation of emotion expression (Gyurak et al., 2012; Salas et al., 2016), and (2) instructed and spontaneous regulation of emotion expression (Goodkind et al., 2010; Gyurak et al., 2009). This work has thus far revealed more pronounced neural differences for instructed versus spontaneous than for up- versus down-regulation.

New Insights on Emotion Regulation

Our research using neurological patients has deepened our understanding of how the brain carries out the exquisite and complex task of regulating human emotion. Here I briefly describe some of our more surprising findings.

Emotional Suppression Is More Than Simple Response Inhibition

When we (Gross & Levenson, 1993) began our experimental studies of emotion regulation in neurologically healthy individuals, I viewed suppression as akin to the freezing motor behavior some nonhuman animals show in dangerous situations. Our research with neurological patients paints a more complex picture. In a series of studies examining the relationship between tests of executive functioning (Gyurak et al., 2009, 2012) and regulation of emotional expression, greater regulation ability was associated with a test of verbal fluency but not with other relatively simple tests of executive functioning (i.e., response inhibition, set switching, and working memory). Tests of verbal fluency likely capture the more complex processes of monitoring, evaluating, and control necessary for successful up-regulation and down-regulation of emotional expression both when spontaneous or instructed.

Attention Deserves Attention

In the process model of emotion regulation's temporal sequence (Gross, 1998), attention comes earlier than the more commonly studied cognitive change (e.g., reappraisal) and response modulation (e.g., suppression). In a sample of 99 patients with neurodegenerative disease, we (Otero & Levenson, 2019) found that spontaneous visual avoidance (assessed via behavioral coding) in patients with AD did not differ significantly from healthy controls—however, patients with FTD showed markedly reduced avoidance behaviors. Given the ubiquity of attentional regulation, research with neurological patients that explores associations with neural loss in specific brain regions is clearly needed.

"Can Do" versus "Do Do"

The “can do” versus “do do” distinction can be tested in studies that contrast spontaneous with instructed regulation. Although these variants of emotion regulation may be related in neurotypicals, we have found them to be quite dissociable in neurological patients. For example, in a study of facial responding to an aversive acoustic startle stimulus, the startle responses of patients with FTD and AD were indistinguishable from healthy controls when the loud sound occurred without warning. Similarly, when explicitly instructed to suppress facial responding, both patient groups were moderately impaired compared to controls. However, when spontaneous down-regulation was assessed, patients with FTD showed much more profound deficits than the other groups. Consistent with often-heard

clinician observations, individuals with FTD can regulate emotion if someone acts as their frontal lobes (i.e., tells the person what to do in a particular situation).

A Critical Role for the Insula

Early studies of neural substrates of emotional functioning that focused on fear conditioning in nonhuman animals often implicated the amygdala as the “seat” of emotional reactivity (LeDoux, 1992). Not surprisingly, many models of emotion regulation include modulation of limbic emotion generators by prefrontal cortex (Ochsner et al., 2009, 2012). Over the years, the important role the insula plays in emotional functioning has increasingly come to be recognized (Craig, 2009), including its important role in the salience network (Seeley et al., 2009), which plays a critical role in emotional reactivity.

Research with neurological patients has shown that the insula plays a critical role in emotion regulation, as well. An early hint of this was found in a study (Salas et al., 2016) of 10 patients with damage to the right prefrontal cortex who were found to be less able to amplify and suppress emotional facial expressions to an amusing film than healthy controls. However, a follow-up analysis found that these findings were primarily driven by a subgroup of patients who also had damage to the right insula. More recently, in a study of 22 patients with neurodegenerative disease, we (Muhtadie et al., 2021) found that among multiple brain regions measured, smaller gray matter volumes in the right and left insular cortex were most powerfully associated with less ability to suppress emotional expressive behavior in response to a disgusting film. We speculated that suppression requires the integration of interoception, proprioception, and social awareness, all processes thought to involve the insular cortex.

Conclusion

Although research on emotion regulation with neurological patients engenders significant challenges, including gaining access to patients; recruitment; obtaining informed consent; adapting tasks to fit the cognitive, behavioral, and motor deficits of patients; mastering new methods; and disentangling possible confounds (e.g., patients’ cognitive deficits) in interpreting results, I have found this work to be among the most scientifically productive, intellectually compelling, and clinically meaningful research we have conducted in our laboratory. Moreover, this research has been the gift that keeps on giving, with old and new data continuing to answer old questions, pose new questions, deepen our understanding of the neural underpinning of emotional functioning, and stimulate new research directions and methodologies. Thus, I hope this chapter inspires others to use neurological patients in their research on emotion regulation (and other aspects of emotional functioning) and to contribute to this important research area.

ACKNOWLEDGMENTS

Work on this chapter was supported by the National Institute on Aging (grants RO1AG041762 and P01AG019724). I offer profound gratitude to the many graduate students, postdoctorals, staff members, and research assistants whose contributions made this research program possible; Bruce Miller and Jennifer Merrilees and our other collaborators at the Memory and Aging Center

at University of California San Francisco; and the patients and families that allowed us to share their journeys.

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SECTION III

**COGNITIVE
APPROACHES**

CHAPTER 10

Mindset Regulation

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Emotions impact our health (Salovey et al., 2000), well-being (Lyubomirsky et al., 2005), and performance (Diener et al., 2020). Because of these effects, researchers have devoted extensive effort (well summarized in this volume) to understanding how we can better regulate our emotions to improve our lives. Mindsets—core assumptions about the nature and workings of things in the world (Molden & Dweck, 2006)—influence health, well-being, and performance, partly by shaping our emotions. For example, when one is enduring stress, the mindset that stress can be enhancing leads to more positive affect (Crum et al., 2017), which can bolster resilience and health. As a result, changing or regulating mindsets may serve as an effective emotion regulation tool.

The purpose of this chapter is to link mindset research to emotion regulation research more explicitly than before. We do so in several ways: First, we briefly review the literature on how mindsets can influence emotions to illustrate how regulating or changing mindsets can be a form of emotion regulation. Second, inspired by existing emotion regulation techniques, we articulate a perspective for how mindsets themselves may be consciously regulated. Building on well-established emotion regulation techniques, we propose a three-step approach to “mindset regulation,” defined as conscious (explicit, with awareness) and deliberate (with intention) efforts at mindset change. Finally, we discuss how, like emotion regulation, mindset regulation may be facilitated by beliefs about mindsets’ controllability, which we call “meta-mindsets.” We end with a discussion of key questions for future research.

Mindsets Influence Emotions

To manage the world’s inherent complexity, subjectivity, and uncertainty, we adopt mindsets: core assumptions that help us organize and simplify information to create meaning,

make predictions, and motivate action (Zion et al., 2022). While the terms *mindset* and *belief* are sometimes used interchangeably, mindsets are specific types of beliefs about a domain or category (e.g., stress, intelligence, illness, or even emotions themselves) that orient people toward particular expectations (What will happen?), explanations (Why is it happening?), and goals (What should I do?). The mindsets we adopt are not necessarily true or false, or right or wrong. Nevertheless, they can influence how we feel and respond in meaningful ways.

For example, evidence suggests that the experience of stress (defined as adversity in one's goal-related efforts) can have an array of complex influences on our body, mind, and behavior, some facilitatory and some damaging. Stress mindsets refer to the simplified assumptions people make about the *general nature* of stress. They typically lie on a continuum between the mindset that "stress is debilitating" and the mindset that "stress is enhancing." Whereas a stress-is-enhancing mindset reflects the belief that stress can have enhancing consequences on health, performance, and well-being, a stress-is-debilitating mindset reflects the belief that stress debilitates health, well-being, and performance. Both mindsets could be justified—however, the degree to which people hold one mindset or another (as a result of culture, context, experiences, media reports, expert advice, or interventions) impacts their emotions, performance, and health in settings such as education (as an educator or student), military, and finance (see Walton & Crum, 2020, for a review).

Experimental interventions have linked stress mindsets to emotional outcomes. Stress mindsets, for example, are tied to increased positive affect under acute stress (Crum et al., 2017). In one study, activating a stress-is-enhancing mindset before a social stress task led to significant increases in positive emotion (Crum et al., 2017). Another intervention aimed at instilling a stress-is-enhancing mindset in the fall of students' first year of college led to more experiences of positive affect (i.e., a composite of feelings like *excitement*, *happiness*, and *confidence* using experience sampling during the exam week) in the spring semester compared to a comparison group of students who did not receive the mindset intervention (Goyer et al., 2022). The effects of a stress mindset on negative affect are more mixed. Some studies suggest that changes in one's stress mindset amid chronic enduring stressors are associated with a reduction in negative emotion (Crum et al., 2023), while others suggest that stress mindsets change positive emotion but may not reduce negative emotion in the moment of an acute stressor (Crum et al., 2017).

Growth mindsets—the belief that one's intelligence or other skills, traits, or attributes (Dweck, 2008) are malleable (vs. fixed)—also influence emotions. In education, the mindset that intelligence is malleable predicts greater motivation, mastery-oriented learning, and persistence (Dweck, 2008; Dweck & Yeager, 2019). Across three studies, Yeager et al. (2011) found that a fixed mindset about one's personality predicted a heightened desire and intention to engage in aggressive retaliation. This effect was driven by students with a fixed mindset, who were more likely to harbor negative feelings about themselves (e.g., shame), view their adversaries as bad people, express hatred toward them, and think that vengeful ideation is an effective emotion regulation strategy (Yeager et al., 2011). Further, educators who held the mindset that their teaching abilities were malleable had more positive emotions (i.e., enjoyment), which then predicted engagement (Frondozo et al., 2020; Nalipay et al., 2021) and well-being (Nalipay et al., 2022). In sum, given that mindsets influence emotions, regulating mindsets may be a potential route to regulating emotions.

Mindsets about Emotions

The previous section discussed how mindsets about domains such as intelligence or stress could influence people's emotions when those domains are relevant—however, people can have mindsets *about emotions* (e.g., emotions are bad, beneficial, controllable) and about specific emotions (e.g., happiness or anxiety is malleable). Mindsets about emotions have consequences, most notably on effort, motivation, and the success of emotional regulation (Bigman et al., 2016; Gutentag et al., 2017; Tamir et al., 2007). Tamir et al. showed that people differ in their mindsets about emotions. Whereas some people believe emotions can be changed (growth) or controlled, others believe emotions are static (fixed).

People's mindsets about emotions are linked to regulatory strategies (e.g., acceptance, avoidance, reappraisal, perspective taking) that impact health, well-being, and social and emotional function (De Castella et al., 2013, 2018; Ford et al., 2018). In a longitudinal study, Tamir et al. (2007) found that students who held the mindset that emotions were malleable had higher emotional regulation self-efficacy and reported more use of cognitive reappraisal, which, in turn, resulted in better social (e.g., loneliness, social adjustment) and emotional (e.g., positive and negative emotions, well-being, depression) outcomes. Kneeland and colleagues (2020) found that moderately depressed individuals with a malleable mindset reported greater use of cognitive reappraisal in response to upsetting daily events, resulting in an overall decrease in negative affect. Using moderation analysis, Schroder et al. (2017) show that growth mindsets about anxiety can protect or exacerbate (moderate) the relationship between stressful life events and posttraumatic stress symptoms, depression, substance use, and motivation for nonsuicidal self-injury. Importantly, research suggests that mindsets are malleable across many domains. For example, Smith and colleagues (2018) show that adolescents can improve their well-being by changing their mindsets about emotions.

Mindset Regulation: Taking Inspiration from Emotion Regulation Strategies

In our view, there are three critical components for conscious emotion (and mindset) regulation. First, people must be *aware* of their emotions (Ludwig et al., 2020; Sendzik et al., 2017). Second, people must *understand* the mental, physiological, and behavioral impact of emotions on their lives (Brackett et al., 2019; Mayer et al., 2008). Third, people must deploy effective techniques (such as mindful breathing, visualization, reappraisal, etc.) to deliberately *regulate* (express, maintain, alter, or change) their emotional responses (Brackett et al., 2019; Webb, Gallo, et al., 2012; Webb, Miles, et al., 2012).

Similar strategies and components can be applied to regulating mindsets. Akin to emotion regulation, a critical first step in conscious mindset regulation is to *be aware that you have mindsets*. Due to “naïve realism” (Ross & Ward, 1996) it is easy and common for people to assume their mindsets are mere reflections of the world *as it is*. Nevertheless, our mindsets constantly filter our perceptions, which are informed by factors such as upbringing, experiences, and culture(s). Recognition of these sources of mindsets is critical, as it allows us to realize that the mindsets we happen to hold are not inevitable and that other mindsets may be possible. Without such awareness, preexisting mindsets continue to “unconsciously dominate perception and action” (Crum & Lyddy, 2014, p. 13).

The second component of mindset regulation involves *understanding mindsets*. Like emotion regulation, this means understanding both (1) why we have a particular mindset

in the first place (what sources helped form it); and (2) the effect of holding that particular mindset on our behaviors, emotion, attention, and physiology. After people become aware that they have a stress-is-debilitating mindset, for example, they might begin to understand that it results from negative public health messaging. They might also notice how this stress-is-debilitating mindset, even if originally well-intentioned, may be influencing their emotions (e.g., making them *more stressed*), behaviors (e.g., overreacting to stressors or denying/suppressing them), attention (e.g., paying attention to all the ways stress is, in fact, debilitating), and physiology (e.g., making them less healthy). This process of seeking to understand mindsets and their source enables one to identify which mindsets may be more adaptive, depending on one's circumstances and goals.

Once people are aware of and understand the impact of their mindsets, they can become agentic in deploying strategies to help them *Maintain or change their mindsets*. Changing to a particular mindset may be easy or difficult, and individuals might employ various strategies to try to do so. They might say the mindset aloud or write it down daily as a reminder. They might seek evidence that supports the mindset they would like to adopt, such as deliberately focusing on research that supports it (e.g., reading research documenting how the body's stress response can make us stronger), or on their own past experiences that confirm that mindset (e.g., noticing that all the times they grew in meaningful ways in their life involved enduring some stress). Finally, individuals might seek to change a mindset by acting in ways that reaffirm that the mindset is true (e.g., deliberately behaving in ways to increase the likelihood that stress will have enhancing outcomes).

Meta-Mindsets: A Precursor to Mindset Regulation?

Like mindsets about the malleable nature of emotions, mindsets about whether mindsets can be controlled or changed (what we call the controllable meta-mindset [CMM]) may be similarly consequential for mindset regulation. Believing you can control your mindset may increase your motivation and ability to engage in the skills, actions, and/or behaviors that support mindset regulation (i.e., reflection, mindfulness practice, perspective taking). Believing you can control your mindset may increase the ability and likelihood of monitoring or identifying mindsets to select or attempt to regulate (Ford & Gross, 2019). Although work on CMM is new, early research suggests that individual differences in CMM moderate the effectiveness of mindset interventions. In one study, the effect of a stress mindset intervention on educators was moderated by CMM, such that educators in the intervention condition (vs. active control), who believed they could control their mindset (high CMM), had greater improvements in stress mindsets, health, well-being, anxiety, and burnout 1 month later compared to those who did not believe they could control their mindset (Evans et al., 2022).

Key Questions and Future Directions

We have introduced the concept of mindset regulation as an additional, novel approach to regulating emotions and, more broadly, evoking positive outcomes in health, well-being, and performance. Furthermore, we have shown how the rich history and wisdom on emotional regulation can inform our understanding of the mindset regulation process. Several questions are essential to pursue in future research.

One crucial question is how mindset and emotion regulation interact and inform each other. One benefit of mindset regulation is that it may evoke automatic emotion regulation across *many situations* broadly. For example, regulating one's stress mindset, such that one comes to adopt the mindset that "stress is enhancing," could influence how one appraises various stressors across multiple occasions. This does not mean one should not also use emotion regulation tactics within each of those situations or in response to specific emotions that arise but rather that directing regulatory efforts toward establishing a more adaptive mindset about the broader nature of stress may indirectly and automatically influence one's emotions in many stressful situations. In this way, mindset regulation becomes an antecedent-focused emotion regulation strategy.

A potential downside of mindset regulation is that the regulatory skills of awareness and understanding may be higher hurdles when it comes to mindsets versus emotions. The experience of emotions is undoubtedly visceral, making emotions sometimes impossible not to notice. Cultivating awareness of one's mindset may require a more sophisticated—and integrated—awareness of one's thoughts, beliefs, and reactions (i.e., meta-awareness). Future research should explore whether enhancing trait meta-awareness can improve mindset regulation. Interestingly, emotions may serve as a starting point or trigger for identifying one's mindset. For example, upon noticing that one has a similar emotional reaction to particular situations or circumstances, one might seek to understand what mindsets might trigger such a reaction. Decades of research have focused on identifying and understanding emotions—what they are, how they work, and their impacts. By contrast, research on mindsets is nascent, and more work is needed to identify and refine a range of potential mindsets beyond growth and stress mindsets.

Finally, more research is needed to design and test interventions that improve mindset regulation techniques, such as the three-step strategy outlined here. Boosting people's ability to regulate their mindsets may directly benefit health and well-being. Improving regulatory skills may also enhance the effectiveness of existing mindset interventions (e.g., growth and stress mindset interventions). Notable questions include What strategies are most helpful for changing mindset deliberately? Do they differ across different mindsets? Are there particular times or situations where it is more challenging to regulate mindsets successfully? Does believing you can control your mindset predict the frequency and success of mindset regulation? Do cultures differ in their beliefs about mindset regulation? How can parents, doctors, educators, and others help facilitate mindset regulation skills in others?

We have introduced the notion of mindset regulation, focusing on the conscious and deliberate regulation of mindsets. Building on the emotion regulation literature, we propose that by becoming aware of mindsets, understanding them, and then actively regulating them, people may be able to influence their emotions across situations and, more broadly, influence their lives. Understanding how to regulate emotions is an inherently human form of empowerment that is only broadened by mindset regulation.

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CHAPTER 11

Emotion Regulation Choice

WHERE ARE WE, AND WHERE DO WE GO?

GAL SHEPPES

Choice behavior is a powerful tool through which we control our environment. Due to its fundamental importance, choice behavior became an independent decision-making field of study (see Fischhoff & Broomell, 2020, for a review). In this field, a major emphasis has been placed on domains involving choice between options that constitute individuals' *external* environment (e.g., choosing healthy over nonhealthy food, or choosing to receive less money sooner over more money later). While important, the major aim of this chapter is to organize the evolving literature of a central domain involving choice between options of individuals' *internal* environment—namely, decision making concerning the regulation of one's emotions.

Where Are We? Emotion Regulation Choice Conceptual Framework and Working Hypothesis

The starting point of the emotion regulation choice conceptual framework involves situating it in the extended process model (Gross, 2015). In this four-stage model, emotion regulation begins with *identification* of the need to regulate one's emotion, followed by *selection* between available regulatory options, followed by *implementation* of the selected regulatory option, and then followed by *monitoring* how an implemented regulatory option is faring across time.

Of the four regulatory stages, emotion regulation-related choices are a central defining characteristic in the three stages that precede and follow regulatory implementation (Sheppes, 2020). Therefore, I divide the broad “emotion regulation choice” construct to subconstructs based on the central choice associated with each regulatory stage. Specifically, regulatory *identification* choice involves making the broad initial decision whether to regulate an emotion or not. Regulatory *selection* choice involves deciding which of

the currently available strategies would be implemented. Regulatory *monitoring* choice involves the decision whether and how to adjust an active implemented strategy (see Figure 11.1 for assessment of regulatory choice across stages). Note that some conceptual accounts (Sheppes et al., 2015; Gross et al., 2019) suggest that the implementation stage may also include emotion-regulated-related choice between specific regulation tactics or instances (e.g., selecting between neutral and positive attentional distraction) of broad

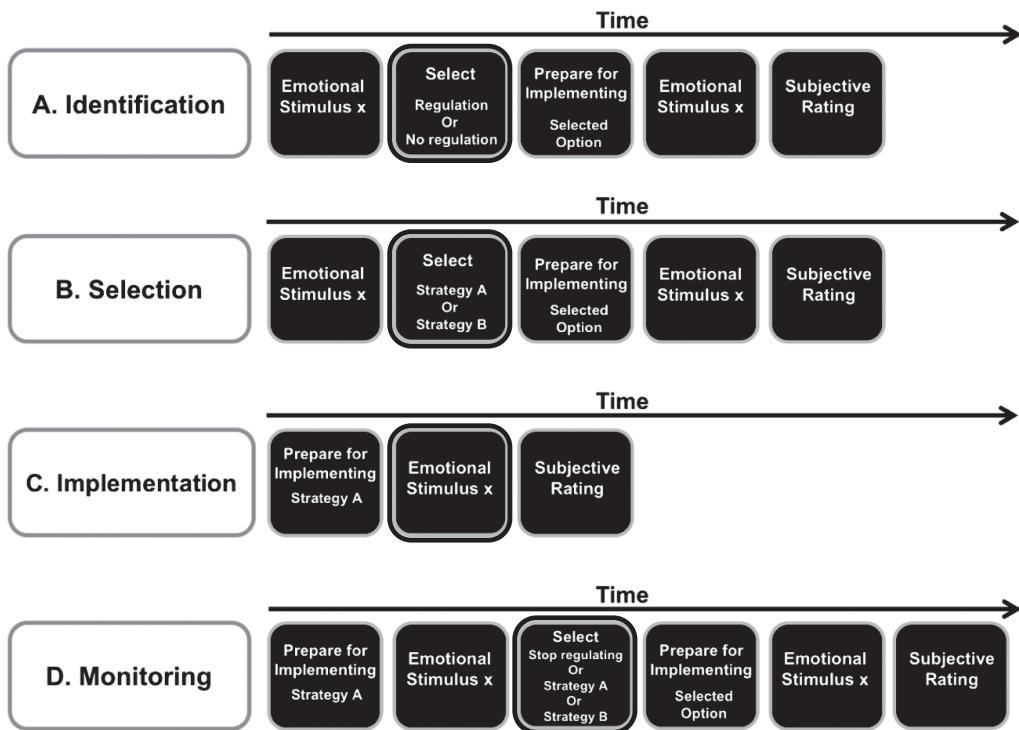


FIGURE 11.1. Schematic trial structures of lab paradigms that measure four core regulatory stages. (A) Regulatory identification: An emotional stimulus is presented, followed by making a choice between regulation or no regulation (see black-framed panel), followed by preparing to execute the chosen option, followed by actually implementing the chosen option on the emotional stimulus, followed by providing subjective rating. (B) Regulatory selection: An emotional stimulus is presented, followed by making a choice between different regulatory options (see black-framed panel), followed by preparing to execute the selected option, followed by actually implementing the selected option on the emotional stimulus (see black-framed panel), followed by providing subjective rating. (C) Regulatory implementation: Preparing to execute a regulatory instruction, followed by actually implementing the instructed option on the emotional stimulus (see black-framed panel), followed by providing subjective rating. (D) Regulatory monitoring: Preparing to execute a regulatory instruction, followed by actually implementing the instructed option on the emotional stimulus (see black-framed panel), followed by making a choice between stopping, maintaining, or switching the instructed option; followed by preparing to execute the selected option; followed by actually implementing the selected option on the emotional stimulus; followed by providing subjective rating. Note that in each regulatory stage, a red frame highlights where a central outcome is extracted from. For identification, selection, and monitoring the central outcome is the regulatory decision, and for implementation the central outcome occurs when the instructed strategy is implemented on the emotional stimulus. From Sheppes (2020). Used with permission.

emotion regulation strategy categories (e.g., attentional deployment)—however, because the conceptual distinction between strategy and tactic-regulatory choice has not been tested empirically, I do not discuss regulatory implementation choice further.

Within each of the three regulatory stages I zoom in on regulatory choices involving widely studied and well-defined cognitive strategies, situated on a central disengagement-engagement continuum that represents differential degrees of affective information processing (Ochsner & Gross, 2005). Central to this conceptual framework is the idea that predicting regulatory choices requires understanding the underlying mechanism of disengagement and engagement strategies that result in differential cost–benefit profiles (see Table 11.1).

On the relative left side of the disengagement–engagement continuum, *distraction*’s underlying mechanism involves early attentional disengagement from emotional information processing via the production of independent neutral thoughts. Disengagement–distraction occurs before information is represented in working memory and undergoes elaborated meaning processing.

On the relative right side of the continuum, *reappraisal*’s underlying mechanism involves early attentional engagement with emotional information, representing it in working memory and appraising it affectively, prior to a late modulation at a semantic-meaning stage. The contents of reappraisals depend on and conflict with affective appraisals.

The underlying mechanisms of disengagement and engagement-regulatory strategies yield differential affective, cognitive, and motivational consequences that constitute cost–benefit profiles (see Table 11.1). The *affective* consequences of early attentional disengagement (relative to late-meaning change of engagement–reappraisal) are stronger modulation of high-intensity *negative* and *positive* emotional information. The *cognitive* consequences of producing neutral thoughts that are independent from an affective stimulus in disengagement–distraction (relative to producing reappraisals that semantically depend on affective appraisals) are *lower resource* expenditure and *minimal* dependence on affective stimulus *affordances* (i.e., regulatory opportunities inherent in an affective stimulus, such as specific content in an image that can aid its reinterpretation). *Motivational* consequences include *temporal goals* and *directional goals*. *Temporal goals* (*short vs. long term*) are characterized by affective processing in disengagement–distraction and provide short-term relief but not long-term benefit upon reexposure to affective events. Elaborated processing in engagement–reappraisal that fundamentally changes affective appraisals provides long-term benefits upon reexposure. *Directional goals* (*down-regulation vs. up-regulation*) are characterized by attention via disengagement–distraction that is tailored and thus results in effective decrease of emotions (down-regulation), and increasing attention via engagement rumination that is tailored and results in effective increase of emotions (up-regulation).

The central working hypothesis of this conceptual framework is that consideration of underlying mechanisms and resultant cost–benefit profiles of regulatory strategies allows predicting regulatory choices (Sheppes, 2020). Specifically, healthy individuals can consider the cost–benefit profile of disengagement and engagement-regulatory strategies and flexibly adapt their regulatory choices accordingly. Furthermore, deviations from a flexible regulatory choice pattern characterizes certain developmental and clinical populations.

Below, I review relevant supporting studies across the three regulatory stages. The order in which the stages are reviewed below (regulatory selection followed by regulatory monitoring and regulatory identification) is based on the degree of existing empirical

TABLE 11.1. Costs and Benefits of Disengagement Strategies (e.g., Distraction) versus Engagement Strategies (e.g., Reappraisal)

		Disengagement Strategies (e.g., distraction)	Engagement Strategies (e.g., reappraisal)
Affective	Negative content	Effective with high intensity	Less effective with high intensity
	Positive content	Effective with high intensity	Less effective with high intensity
Cognitive	Resources	Low resource expenditure	High resource expenditure
	Affordances	No dependence	High dependence
Motivational	Temporal goals	Short-Term effectiveness	Long-Term effectiveness
	Directional goals	Effective down-regulation	Effective up-regulation* (*rumination)

Note. For each of these regulation options, affective, cognitive, and motivational consequences are presented. All consequences of disengagement strategies refer to distraction. All consequences of engagement strategies refer to reappraisal except for directional goals that refer to rumination.

support rather than on the stages' chronological order. In addition, in this review, I focus on studies that meet the definition of emotion regulation choice involving decision-making processes that guide an active selection between available regulatory options. This definition precludes important yet indirect lines of research that assess general frequencies of regulatory strategy usage, and thus cannot determine whether usage is preceded by decision-making processes.

Regulatory Selection Choice

Of the three regulatory stages involving emotion-regulatory-related choices, regulatory selection choice received the most support (Sheppes, 2014, 2020). Congruent with the conceptual framework, below I review affective, cognitive, and motivational determinants of selection choice and developmental and clinical extensions.

Affective Determinants of Regulatory Selection and Links to Trauma Psychopathology

The conceptual framework predicts that healthy individuals can flexibly adapt their regulatory selections according to strategies' affective cost–benefit profile. Specifically, in high- (negative and positive) intensity situations, where attentional disengagement provides strong immediate modulation, it should be chosen more relative to engagement–reappraisal—however, in low- (negative and positive) intensity situations, where both strategies equally modulate affect in the short term, but only reappraisal offers long-term benefits, it should be chosen more relative to attentional disengagement.

Multiple studies show that when healthy individuals are exposed to negative images (e.g., Sheppes et al., 2014), negative words (Fine et al., 2022), COVID-19-related sentences (Shabat et al., 2021), aversive sounds (Feldman & Freitas, 2021), and electric shocks (Sheppes et al., 2011), individuals predominantly select disengagement–distraction in high intensity, and mostly select engagement–reappraisal in low intensity (see Matthews et al., 2021, for a meta-analysis).

Additional studies show that when healthy individuals are exposed to general positive images (e.g., Hay et al., 2015), or specific erotic images (Shafir et al., 2018), they predominantly select disengagement–distraction to down-regulate high intensity and mostly select engagement–reappraisal to down-regulate low intensity.

As opposed to healthy individuals' flexible regulatory selection to differing affective intensities, reduced regulatory selection flexibility was proven important in understanding emotion dysregulation related to trauma. While traditional views (e.g., Foa et al., 2008) hold that trauma psychopathology is associated with overutilizing disengagement-regulatory strategies at the expense of engagement, an updated view suggests that trauma psychopathology involves a reduced ability to flexibly choose between engagement and disengagement strategies according to differing situational demands. Supporting this view, one study found that exclusively among low-regulatory selection flexibility firefighters, increased exposure to traumatic events was associated with a greater number of posttraumatic stress disorder (PTSD) symptoms (Levy-Gigi et al., 2016). Furthermore, a recent study found that relative to healthy individuals, reduced regulatory selection flexibility was observed in students with high PTSD symptoms (meeting the clinical cutoff) and in female patients with PTSD due to childhood sexual abuse (Fine et al., 2021).

Cognitive Determinants of Regulatory Selection and Links to Development

The conceptual framework predicts that healthy individuals can flexibly adapt their regulatory selections according to strategies' *cognitive* cost–benefit profile. Specifically, engagement–reappraisal, which involves producing effortful reinterpretations that conflict with affective appraisals, are selected less when cognitive *resources* are low and when *affordances* for reappraisals in emotional stimuli are low.

Findings supporting the influence of resources on regulatory selection come from several studies (e.g., Milyavsky et al., 2019). Specifically, engagement–reappraisal was selected less when cognitive effort was enhanced, either by having participants actually implement their regulatory choices (rather than only hypothesize how they would choose), or when reappraisals that participants could form depended on affective appraisals (i.e., situation-focused reappraisal vs. reality-challenge reappraisal that questions the general authenticity of emotional stimuli).

Findings supporting the influence of affordances on regulatory selection come from influential, correlational (e.g., Young & Suri, 2020), and experimental studies (e.g., Suri et al., 2015, 2018, studies 3 and 4). In correlational studies, a decrease in self-reported reappraisal affordances was correlated with decreased reappraisal choice. Experimental studies having participants form their own reappraisal (low affordance) versus providing concrete reappraisal options resulted in decreased reappraisal choice.

Beyond supporting hypotheses regarding the influence of cognitive resources on regulatory selection in adults, important developmental implications were demonstrated in young children (Dorman-Ilan, Tamuz, et al., 2019). According to a selection, optimization, and compensation with emotion regulation developmental framework (Urry & Gross, 2010), choosing regulatory strategies whose cognitive resource requirements fit with the cognitive resources an individual or groups possess, would be associated with adaptive functioning. Accordingly, it was shown that exclusively among children who have low cognitive resources (i.e., low working memory capacity), higher selection of low-effort disengagement–distraction was associated with higher adaptive functioning reported by parents (Dorman-Ilan, Tamuz, et al., 2019).

Motivational Determinants of Regulatory Selection and Links to Depression

The conceptual framework predicts that healthy individuals can flexibly adapt their regulatory selections according to strategies' *motivational* cost–benefit profile. Specifically, engagement–reappraisal, which involves elaborated processing that changes affective appraisals, will be selected more when *temporal goals* that focus on long-term benefits are active. In addition, when *directional goals* are activated, disengagement–distraction that involves decreasing attention will be selected more when *down-regulation* is warranted, and engagement–rumination that involves increasing attention will be selected more when *up-regulation* is aimed.

Findings supporting the influence of temporal goals on regulatory selection showed that engagement–reappraisal was selected more when participants knew they would reencounter emotional stimuli (long-term condition) relative to when they did not (short-term goal; Sheppes et al., 2014; but see Ortner et al., 2021, showing this effect is evident in individuals who tend to consider the future consequences of their actions).

Findings supporting the influence of directional goals on regulatory selection showed that across lab and daily life contexts, healthy individuals flexibly select engagement–rumination to up-regulate their emotions and select disengagement–distraction to down-regulate their emotions (Millgram et al., 2019).

Importantly, the influence of directional goals was proven important in determining between two central theories of aberrant rumination and distraction selection in depression. According to one account (e.g., Watkins & Nolen Hoeksema, 2014), because rumination is highly preferred and automatic in depression, higher rumination selection for up-regulation and down-regulation goals should evince in depressed relative to nondepressed individuals. By contrast, according to a second account (e.g., Rottenberg et al., 2005), because depression is associated with emotion-context insensitivity, depressed individuals would show reduced regulatory selection flexibility, manifested in impaired matching of regulatory strategies to goals.

Results fully supported impaired regulatory selection flexibility, showing that, relative to healthy individuals, depressed individuals selected rumination less for up-regulation and selected distraction less for down-regulation (Millgram et al., 2019).

Regulatory Monitoring Choice

The application of the conceptual framework to regulatory monitoring follows the same aforementioned logic: Monitoring decisions (whether an implemented regulatory option should be maintained, switched, or stopped) should be dictated by maximization of the benefits over the costs of different regulatory options across contexts. As opposed to the regulatory selection section, regulatory monitoring choice studies remain limited to affective determinants.

Affective Determinants of Regulatory Monitoring

The conceptual framework predicts that healthy individuals flexibly adapt their regulatory monitoring choices according to strategies' affective cost–benefit profile. Specifically, in high intensity, implementing reappraisal that does not provide adequate modulation should lead to choosing to switch to disengagement–distraction. By contrast, in low

intensity, implementing distraction that does not provide adequate long-term modulation should lead to choosing to switch to reappraisal.

In a pioneering study, Birk and Bonanno (2016) demonstrated that particularly when reappraisal implementation was associated with higher physiological negative intensity, healthy individuals selected to switch to disengagement–distraction. Supporting the full account, a study showed that when healthy individuals were instructed to implement engagement–reappraisal to regulate high-intensity negative images, they strongly switched to disengagement–distraction, and when instructed to implement disengagement–distraction to regulate low-intensity images, they strongly switched to engagement–reappraisal (Dorman-Ilan, Shafir, et al., 2019).

Regulatory Identification Choice

According to the conceptual framework, identification decisions (whether to regulate one's emotions or not) can be predicted by healthy individuals' maximization of the benefits over the costs of different regulatory options relative to not regulating across contexts. Regulatory identification choice studies remain limited to affective determinants.

Affective Determinants of Regulatory Identification

The conceptual framework predicts that healthy individuals flexibly adapt their regulatory identification choices according to strategies' *affective* cost–benefit profile. Specifically, the choice to regulate one's emotions should be particularly evident when needing to regulate high-intensity events and when given an option to use the effective strategy of disengagement–distraction.

A recent set of studies investigated in two emotional contexts (negative pictorial stimuli or electric shocks) the role of external emotional intensity (high, low) and regulation strategy (whether a no-regulation option was paired with disengagement–distraction or with engagement–reappraisal) on regulatory identification decisions (Amit et al., under review).

Congruent with our conceptual framework arguing that attentional disengagement is highly effective in high-intensity situations, the preference to regulate (over not regulating) was mainly evident when participants had the option to regulate via attentional disengagement high-intensity electric shocks.

Where Do We Go? Future Directions

While studies on emotion regulation choice are accumulating, in this final subsection I point out gaps in knowledge that could guide future studies.

Gaps Regarding Regulatory Stages

Although regulatory *selection* choice has been widely studied, studies on regulatory monitoring and identification are limited. In particular, while the conceptual framework delineates clear predictions regarding the influence of cognitive and motivational determinants, there are no existing studies testing these factors in regulatory monitoring and identification. Furthermore, while conceptual accounts describe expected deviations

from adaptive regulatory monitoring and identification choices in clinical and developmental populations (e.g., Gross et al., 2019; Sheppes et al., 2015), empirical studies are lacking. Accordingly, future studies should examine cognitive and motivational determinants of regulatory monitoring and identification and translations to developmental and clinical populations.

Gaps Regarding Links between Regulatory Stages

Inherent to many conceptual accounts is the notion that emotion regulatory stages interact (e.g., Bonanno & Burton, 2013; Gross et al., 2019; Webb et al., 2012)—however, to date, only a few empirical studies link between regulatory stages.

One notable exception is a conceptual framework describing the relationship between the two most-studied regulatory stages: regulatory implementation and selection (Silvers & Guassi Moreira, 2019). Empirically, a recent small-scale study directly tested whether neural regulatory implementation ability is associated with behavioral regulatory selection (Fine et al., 2022). Consistent with the conceptual model, the study found that for disengagement–distraction (but not engagement–reappraisal) that was associated with robust amygdala modulation, a decrease in amygdala activity during implementation was associated with selecting more disengagement–distraction.

While providing initial evidence for the interaction between regulatory stages, future studies that map potential interactions between all four basic regulatory stages are clearly needed.

Gaps Regarding Regulatory Strategies

Although conceptual accounts describe the operation of multiple regulatory strategies (Bonanno & Burton, 2013; Gross, 2015), existing emotion regulation choice studies tend to focus on decisions between disengagement–distraction and engagement–reappraisal.

To address this gap the conceptual framework, relying on a disengagement–engagement continuum, offers clear predictions for strategies beyond distraction and reappraisal. Initial supporting evidence (Sai et al., in preparation) from a study examining four strategies across the continuum, showed that when presented with low-intensity images, individuals selected the more engaging option within each pair of strategies (i.e., preferring distraction over avoidance, distancing over distraction, and reappraisal over distancing), and when presented with high-intensity images, individuals selected the more disengaging option within each pair of strategies (i.e., preferring avoidance over distraction, distraction over distancing, and distancing over reappraisal). Future studies should examine strategies across the continuum in regulatory monitoring and identification.

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CHAPTER 12

Affordances and the Mechanisms Underlying Reappraisal

GAURAV SURI

An affordance refers to the possibility of an action on an object—for example, a suitcase handle affords lifting, a chair affords sitting, and a brake pedal affords pressing.

The concept of affordance was established in cognitive psychology to refer to all action possibilities latent in the environment (Gibson, 1977; Norman, 1999). Over the past several decades, psychologists have broadly applied the concept of affordances in perception, decision making, environmental psychology, human–computer interaction, and artificial intelligence. More recently, affordances have been productively applied to emotion regulation in general, and to cognitive reappraisal in particular.

A *reappraisal affordance* is defined as the opportunities for semantic reinterpretation that are inherent in a stimulus (Suri et al., 2018). For example, an image of someone undergoing an unpleasant dental procedure in a hospital offers plausible possibilities for reappraisal (e.g., they will soon be cured), whereas an image of dead or mutilated children offers fewer acceptable possibilities. In this sense, the former might be said to have higher reappraisal affordances than the latter. Reappraisal affordances have emerged as an important driver in emotion regulation choice.

Reappraisal Affordances and Emotion Regulation

The subfield of emotion regulation choice is concerned with the choice of emotion regulation strategy that people make in contexts eliciting emotion (Sheppes, 2014). These decisions have shown to be profoundly consequential (Gross, 1998, 2015; Koole, 2009; Parkinson & Totterdell, 1999; Tamir, 2009; Webb et al., 2012) and it is, therefore, important to understand the drivers of these choices.

Prior studies have identified the emotional intensity of the stimulus as an external driver of emotion regulation choice in that people prefer reappraisal to distraction when the emotional intensity of the eliciting stimulus is low, but prefer distraction to

reappraisal when emotional intensity is high (e.g., Sheppes et al., 2011, 2014). We reasoned that one possible underlying driver for these patterns in emotion regulation choice was that some stimuli were more reappraisable (i.e., had greater reappraisal affordances) than other stimuli. Many high-intensity stimuli, for example, appeared to have few reappraisal affordances relative to low-intensity stimuli.

To investigate this possibility, my colleagues and I set out to systematically study reappraisal affordances. Over several studies using a diverse set of stimuli that included vignettes and emotion-eliciting images, we established the following: First, reappraisal affordances are mostly consistent across both people and time. We demonstrated this (Suri et al., 2018) by asking participants to rate reappraisal difficulty of several stimuli at two different time points separated by a week. We found that participant ratings for the same stimulus were strongly correlated and that each participant's ratings at Time Point 1 were strongly correlated with their ratings at Time Point 2. Second, we established (Suri et al., 2018; Young & Suri, 2020) that reappraisal affordances are inversely, and strongly, correlated with intensity, but that the two variables are separable from each other. Thus, while in general, high-intensity stimuli had low reappraisal affordances and vice versa, it was possible to construct vignettes that participants rated to be high intensity and have high reappraisal affordances, as well as vignettes that they rated to be low intensity and have low reappraisal affordances. Relatedly, participant ratings for the intensity of emotion-eliciting images were strongly, but not perfectly, correlated to their ratings for reappraisal affordance of those same images. Third, we established that reappraisal affordances were an independent and strong predictor of emotion regulation choice, such that higher reappraisal affordances were correlated with higher selection rates for reappraisal. In regression models that included emotion intensity ratings and reappraisal affordance ratings, both variables were found to be strong and separate predictors of emotion regulation choice (Young & Suri, 2020).

Two Unanswered Questions

In science, one set of findings often leads to a set of new (and deeper) questions. In the present context, this new set of questions was based on the following two observations: First, while reappraisal affordances were generally consistent across participants and across time, participants were unable to explain what made a stimulus have higher or lower reappraisal affordances. In debriefing sessions (Suri et al., 2018; Young & Suri, 2020), participants reported that it was not necessarily the number of alternative appraisals that chiefly contributed to their affordance ratings—rather, their ratings were often related to the quality of alternative appraisals that presented themselves to them. They were unable to expound on the specifics of this quality. Second, participants reported that while alternative appraisals often occurred to them spontaneously and automatically, the process of adopting an alternative appraisal and “making it stick” required control and felt effortful—sometimes irrespective of the reappraisal affordances of the alternative appraisals.

These observations, while still requiring systematic confirmation, immediately lead to the following questions:

1. What quality might make an alternative appraisal contribute to higher or lower reappraisal affordance ratings?
2. What mechanism makes alternative appraisal generation relatively automatic and alternative appraisal implementation more controlled?

In the rest of this chapter, we describe a framework rooted in the parallel distributed processing (PDP) tradition and based upon cybernetic principles. It consists of two potentially interacting processes: a process that generates appraisals (including a primary appraisal) and a second process that amplifies appraisals whose outcomes are congruent with goals in memory. We suggest that this reappraisal framework may place important theoretical constraints on the eventual answers to the two questions posed above.

A PDP Framework for Generating Appraisals

The PDP framework (Rumelhart et al., 1988) is often used to model aspects of human cognition and emotion. Computational models in the PDP framework are biologically informed and biologically inspired. They consist of simple units, akin to the collections of neurons, organized in networks—that is, linked to one another through weighted connections representing synapses or groups thereof. In such models, often referred to as neural networks, the pattern of activation across a set of units is generally thought to constitute the representation of something while perceiving, processing, or remembering it. These patterns of representation are a function of input from the outside world and the particular connections between units. In neural networks, the connections between units are the knowledge or memory contained in the system. For example, if a unit representing a nimbus cloud causes activation in a unit representing the rain, it is because input from outside the system activated the “nimbus cloud” unit, which in turn activated the “rain” unit because it was connected to it. In neural networks, and in actual brains, such connections are often developed with the experience of co-occurrence—for example, nimbus clouds and rain do frequently co-occur. Many connections in neural networks, as well as in actual brains, are bidirectional. Thus, not only might nimbus clouds activate the concept of rain but observing rain might cause one to predict that there are nimbus clouds present.

In considering a neural network for the development of appraisals, we refer back to the ideas of Lazarus (1968), who identified the centrality of situational elements and outcome elements in the development of initial appraisals and subsequent reappraisals. As depicted in Figure 12.1, we propose a neural network in which units representing situational elements are connected to units representing outcome elements via a pool of hidden units—so-called because these units cannot get input from outside the network. The hidden units represent the appraisals and are activated when they receive activations from other units in the network.

There are two input pools of units in the network. One pool, labeled “Situational Elements,” contains units that each represent some aspect of a given situation. Some of these units—depicted as being contained within the oval with a solid outline—are connected with a unit in the appraisal pool (marked Appraisal 1). Other units—depicted as being contained within the oval with a dashed outline—are bidirectionally connected with a different unit in the appraisal pool (marked Appraisal 2). Some elements of the situation might be connected with both appraisals.

The “Outcome Elements” pool contains units that represent some aspect of the expected outcome. These expected outcomes are also each bidirectionally connected with units in the appraisal pool. Thus, each appraisal is a representation that satisfies constraints related to elements of the situation and elements of the expected outcome. It is conceivable to directly connect situational elements to outcome elements, but indirect

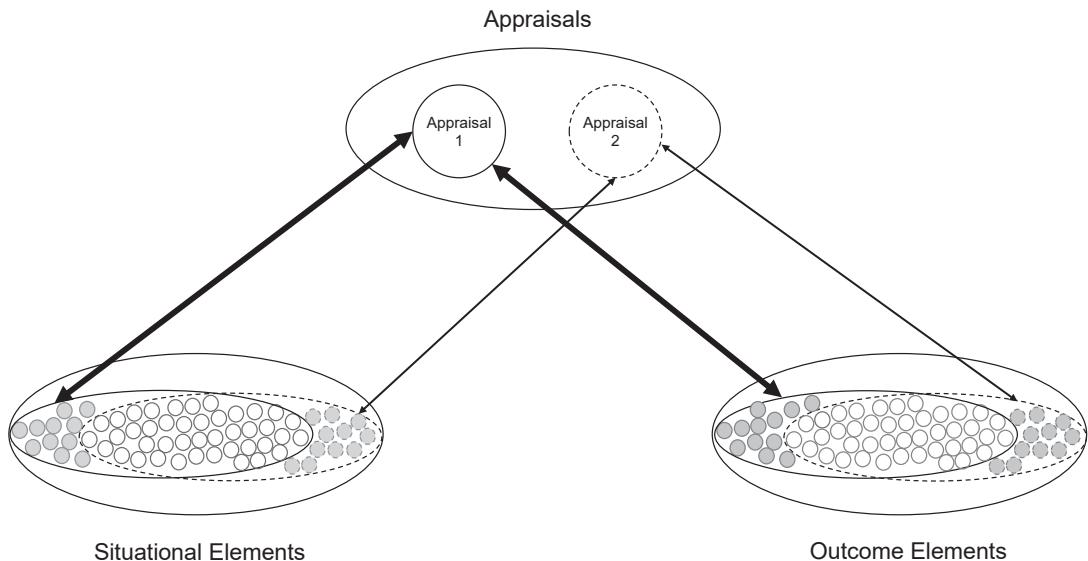


FIGURE 12.1. A neural network in which appraisals emerge via the interaction of situational and outcome elements.

connections via hidden units offer context sensitivity and malleability (see Suri & Gross, 2022; Suri et al., 2020, for a discussion of this issue). For example, units related to momentary motives (not included in Figure 12.1) may play an important role via their connections to hidden units.

The connection weights from the situation elements and outcome elements to a particular appraisal are a function of experience. If a certain situation or outcome element reliably leads to a particular appraisal, then those elements are connected with that appraisal. Stronger connection weights are associated with the greater co-occurrence between units.

It may be instructive to examine the operations of this framework in the context of a specific example. Imagine a situation (see Figure 12.2) in which someone is asked to speak in front of a group of casual acquaintances who could be considered closer to being strangers or closer to being friends. We may assume three situational element units: Situational Unit 1 gets input related to perceiving the audience as being composed of strangers, Situational Unit 2 gets input related to being asked to speak, and Situational Unit 3 gets input related to perceiving the audience as being composed of friends. There are also three output units, where Output Units 1–3, respectively, correspond to anxiety, alertness, and fun.

The network depicts strong connection weights between perceiving the audience as being composed of strangers, appraising the situation as one involving judgment, and responding with anxiety. These weights may be stronger, for example, if a person frequently perceives speaking in front of a group as involving judgment and likely resulting in anxiety (Suri, Sheppes, et al., 2015).

The hidden units receiving the greatest activation become the primary appraisal. Assuming equal input into all six units, the stronger connection weights produce the highest activation in the “being judged” hidden unit, and this unit constitutes the primary

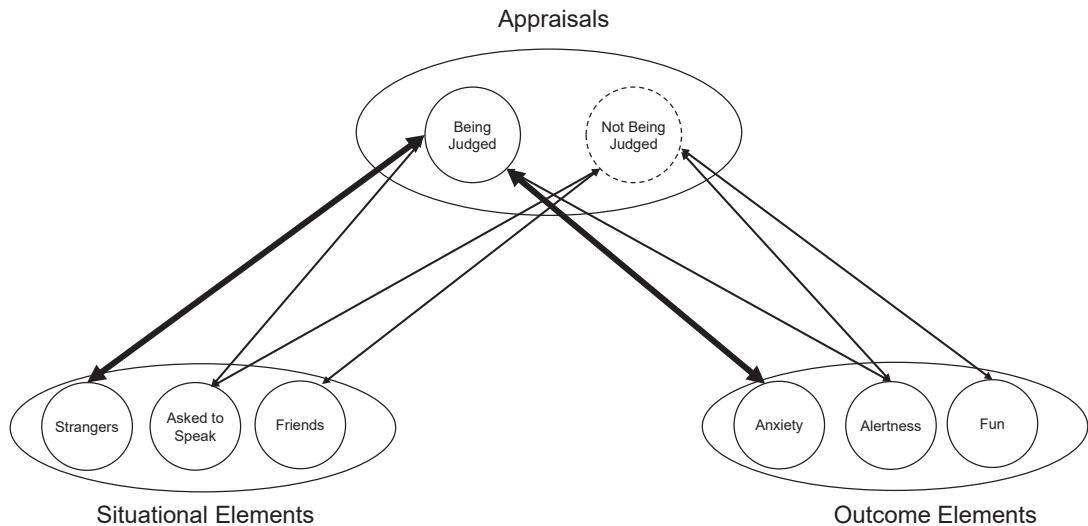


FIGURE 12.2. Two illustrative appraisals emerging from the interaction of situational and outcome elements.

appraisal. The “not being judged” hidden unit also receives activation, but it is not the primary appraisal—rather, it is a candidate for a potential reappraisal.

Not all situational and outcome units always receive equal input. In such a case, the level of input received by units connected to the appraisal unit contributes to its activation, and may therefore play a role in determining the primary appraisal.

A Cybernetic Framework for Implementing Reappraisal

The PDP framework described above creates representations for alternative appraisals (i.e., candidate reappraisals), but does not yet explicate how an alternative appraisal that is activated at a lower level than the primary appraisal can eventually become the dominant appraisal—thereby completing a reappraisal. In considering a framework for the implementation of reappraisals, we refer to the ideas of Gross (2015), who has emphasized the role of cybernetic principles in emotion regulation in general, and reappraisal in particular.

According to cybernetic principles (Wiener, 1948), information-processing structures achieve response stability by comparing current inputs to a goal or reference value (potentially), observing a discrepancy between the two, and then making an adjustment to reduce any such discrepancy. In the context of implementing reappraisal, one instantiation of the cybernetic model may involve comparing the outcome elements of an appraisal presently under consideration (the current input) to a goal that is activated in memory (the reference value). If the outcome elements of an appraisal are sufficiently similar to the goal, that appraisal would be accepted. Alternatively, if its outcome elements are discrepant from a goal, then the cybernetic network would consider alternative appraisals and seek to accept an appraisal whose outcome elements are most similar, and least dissimilar, to a relevant goal.

The network in Figure 12.3, based on Cruse (1996), implements a cybernetic loop for each option being considered. It consists of two input units: one of these receives input related to the goal/reference in working memory (x_r); the second of these receives input proportional to the activation of the output elements of the appraisal under consideration (x_a).

The network also consists of a “similarity” and “dissimilarity” gate. The similarity gate compares the similarity between the appraisal currently under consideration and the reference. It multiplies its received activation by a factor (k_1 , where $k_1 > 1$) that varies with the extent of the similarity between appraisal elements and the reference/goal. The dissimilarity gate multiplies its received activation by a factor (k_2 , where $k_2 > 1$) that varies with the extent of the dissimilarity between appraisal and the goal.

Importantly, the dissimilarity gate has an inhibitory connection to an input unit and inhibits overall activation in the network (shown with a connection ending with a terminal circle in Figure 12.3), whereas the similarity gate has an excitatory connection with an input unit and amplifies overall activation in the network. The result of these connections is that the comparison subnetwork amplifies output (= y in Figure 12.3) related to appraisals that are more similar and less dissimilar to the goals/reference, and it dampens output related to options that are less similar and more dissimilar to the instruction/reference. This may be observed from the activation equation in Figure 12.3 (bottom part). A higher k_2 (dissimilarity) dampens output (y) because it is present in the denominator of the equation.

Effectively, the cybernetic process decreases activation toward goal-incongruent appraisals and increases activation toward goal-congruent appraisals. Since an important feature of the goal is anxiety reduction, a reappraisal that does not reduce anxiety (e.g., by not being believable) will not be implemented.

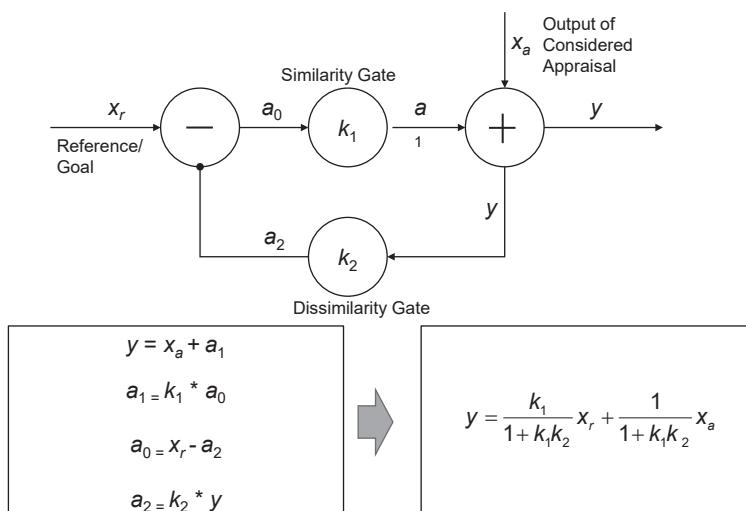


FIGURE 12.3. The cybernetic network and its activation equations. *Top:* The cybernetic network amplifies activations in appraisals whose features are more similar and less dissimilar to the features of the goal or reference. *Bottom:* Upon convergence, the four equations shown on the left are valid, and with some algebraic manipulation yield the output equation shown on the right. This equation defines the behavior of the network.

In the context of the public-speaking example described above, the “anxiety” outcome element of the primary appraisal would be discrepant from a goal related to staying calm. The cybernetic loop would therefore dampen activation for the primary appraisal (“being judged”). Contrastingly, the “fun” element of alternative appraisal would be more similar and less dissimilar to the goal. Therefore, the cybernetic loop would amplify activation for the secondary appraisal (“not being judged”) and this appraisal would eventually get higher activation than the activation for the primary appraisal. A reappraisal would have been implemented.

Implications of the Reappraisal Framework

We are now in a position to make some proposals related to the two questions we asked above. First, according to the reappraisal framework, an appraisal is simply an indirect association between a set of situational and observational elements. The activation value of an appraisal is a function of the input it receives and the connection strengths of its weights. The appraisal with the highest activation is the primary appraisal. The reappraisal affordance associated with an appraisal is proportional to the activation received by that particular appraisal.

Second, according to the reappraisal framework, implementing a reappraisal involves two—potentially interacting—steps. First, situational elements and outcome elements contribute to activation within possibly several appraisals. This process relies on previously learned associations and does not require attention or control. It may be implicit and occur outside of awareness. The second process involves holding potential appraisals in working memory and comparing their outcome elements to the activated goal. We hypothesize that this process requires attention and control and may often feel effortful.

The reappraisal framework offers insights into why people might often generate appraisals but not implement them (Suri, Whittaker, et al., 2015) and why people may not always choose to reappraise in contexts involving emotion regulation choice.

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CHAPTER 13

Harnessing Placebo Effects to Regulate Emotions

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Successful emotion regulation is essential for promoting psychological and physical health (DeSteno et al., 2013; Sheppes et al., 2015)—however, people often experience difficulties regulating their emotions. Even with optimal self-regulation capacity, people have problems managing their feelings when fatigued or stressed (Grillon et al., 2015; Raio et al., 2013). Therefore, it is essential to find ways to make self-regulation less difficult. Placebo effects, which are brain–body responses to an inert treatment and the psychosocial context in which it is delivered (Ashar et al., 2017), offer an avenue to address these issues since they may regulate emotions automatically (Braunstein et al., 2017).

Some researchers use a broad conceptualization of placebo effects to include instances where an active treatment is enhanced by placebo-related mechanisms. Others maintain that the placebo effect requires administering an inert object (e.g., pill, nasal spray) or procedure (e.g., sham meditation). In addition to this complexity, placebo effects occur in many contexts, such as reducing pain, improving cognitive and physical performance, and managing anxiety and depression symptoms (Benedetti, 2021). In this review, we focus on placebo effects that use a placebo object or procedure to regulate emotions. This chapter has four goals. First, we discuss placebo effects and their mechanisms. Second, we review evidence of placebos regulating emotions. Third, we discuss the ethical dilemma in using placebos to regulate emotions and highlight work on placebos without deception. Last, we discuss basic science and translational application questions and suggest directions for future research.

The Placebo Effect

Placebo effects work through two interrelated mechanisms: expectations and learned associations (Ashar et al., 2017). In the placebo context, expectations refer to the probability of an intended beneficial effect. Expectations are typically induced through verbal suggestions. For example, Koban et al. (2017) told participants experiencing a breakup that they would receive a nasal spray that would reduce their negative emotions when looking at pictures of their ex-partner. On the other hand, learned associations are automatic responses to stimuli or procedures. In the placebo context, learned associations refer to pairing a beneficial effect with a placebo object or procedure. For example, Petrovic et al. (2005) intravenously delivered an anxiolytic to participants before viewing distressing images. Participants paired the intravenous drip with feeling less negative when looking at these pictures. In the next session, they received a saline intravenous drip with the verbal suggestion it was the same anxiolytic.

Whether through expectations or learned associations, placebos appear to exert their effects automatically and with minimal cognitive effort (Braunstein et al., 2017). Buhle et al. (2012) examined whether engaging executive function would interfere with placebo effects on pain. The placebo reduced pain experience even when the person simultaneously completed a working memory task. Notably, the placebo did not interfere with cognitive performance, suggesting that it did not require extra mental resources to exert its effects. In a functional magnetic resonance imaging (fMRI) study comparing placebos with cognitive reappraisal (i.e., a strategy that requires more cognitive effort), placebos led to less dorsolateral prefrontal cortex (dlPFC) activation, a brain region associated with selective attention, working memory, and holding active appraisals (Schienle et al., 2017).

How Can Placebos Regulate Emotions?

There is substantial evidence that expectation-based placebos can effectively regulate emotions (Geers et al., 2021). In these paradigms, participants are deceptively told they will receive a treatment to reduce their negative emotions before undergoing a distressing task. In laboratory studies, placebos reduced the experience of distress from negative emotional images (Schienle, Übel, & Scharmüller, 2014; Schienle, Übel, Schöngässner, et al., 2014), sad movie clips (Glombiewski et al., 2019) and memories (Rebstöck et al., 2020), the threat of shock (Meyer et al., 2015, 2019), and a speech task (Abrams et al., 2001). Some evidence shows placebos can impact autonomic measures associated with emotional responses. For example, participants who received a placebo nasal spray showed reduced skin-conductance levels when anticipating painful shocks (Meyer et al., 2015). These studies suggest that placebos influence subjective and objective emotional distress measures.

Much of what we know about neural systems associated with placebo effects come from pain analgesia studies—however, there is evidence that placebos also influence neural measures, such as blood-oxygen-level-dependent (BOLD) fMRI signals (Koban et al., 2017; Petrovic et al., 2005; Schienle, Übel, Schöngässner, et al., 2014) and electrocortical activity (Meyer et al., 2015; Schienle et al., 2020) in emotion regulation contexts. Collectively, these studies show placebos down-regulate brain regions involved in emotional experience (e.g., insula, amygdala). Nevertheless, more research is needed to understand the unique neural systems consistently associated with placebos regulating emotions.

Placebos are also effective in regulating acute emotional distress in clinical samples, including those with social anxiety disorder (Abrams et al., 2001), spider phobia (Gremsl et al., 2018), and depression (Haas et al., 2020). The regulatory effects of placebos also extend to reducing affective symptoms. Meta-analytic findings show that placebos decrease anxiety (Bandelow et al., 2015) and depression symptoms (Khan et al., 2012). It should be noted, however, that active treatments, such as selective serotonin reuptake inhibitors (SSRIs), still outperform placebos (Cipriani et al., 2018), albeit with important moderators. For example, Fournier et al. (2010) showed that placebos performed just as well as antidepressants for patients with mild to moderate depression; antidepressants outperformed placebos only for patients with very severe depression.

In summary, placebos effectively regulate acute bouts of emotional distress for both nonclinical and clinical samples. The positive effects in clinical samples are noteworthy since people with affective disorders often have difficulties regulating their emotions (Sheppes et al., 2015). Moreover, placebos can reduce mild and moderate affective symptoms, which open up their clinical application across the full spectrum of people struggling with emotional problems.

Addressing the Ethical Dilemma of Placebos: Introducing Placebos without Deception

Placebos are remarkably effective in regulating emotions, with more than 25 studies showing positive effects with medium to large effect sizes (Ashar et al., 2017; Geers et al., 2021)—however, to get placebos to work, participants are deceived into believing they are taking an active treatment. On the one hand, placebos can effectively regulate emotions. But on the other hand, people must be deceived to activate their regulatory effects, creating an ethical dilemma. Fortunately, there is growing evidence that placebos can work without deception (i.e., non-deceptive placebos or open-label placebos) by honestly leveraging expectations through verbal suggestions. In non-deceptive placebo studies, participants are educated about the placebo effect, how it can lead to beneficial outcomes in some contexts, how positive expectations can help but are not crucial, and that taking the placebo object as prescribed is important. This educational approach uses a combination of readings, videos, and instructions from an experimenter; there is growing evidence that non-deceptive placebos can regulate emotions like their deceptive counterparts.

In laboratory settings, non-deceptive placebos reduced the experience of self-reported distress from negative emotional images (Guevarra et al., 2020; Schienle et al., 2022) and self-referential sentences with sad music (Hahn et al., 2022). Hahn et al. (2022) also measured heart rate. They found null effects, casting doubt on whether self-reported results reflect genuine regulation effects or are a product of response bias. After all, directly telling participants that the non-deceptive placebo may reduce their negative emotions increases demand characteristics and response bias concerns. Guevarra et al. and Schienle et al. addressed these concerns by showing that non-deceptive placebos reduced neural measures associated with emotional distress (late positive potential [LPP]).

It is worth noting that one study did not show positive non-deceptive placebo effects. Friehs et al. (2022) randomly assigned participants into five groups (control, two deceptive placebo groups, and two non-deceptive placebo groups) before watching a sad film. They found decreases in sadness for deceptive placebos but not for their non-deceptive

counterpart. Their null findings may have to do with their manipulation. Previous studies relied on a combination of reading materials with experimenter instructions (Guevarra et al., 2020), videos with experimenter instructions (Schienle et al., 2022), and oral presentations from an experimenter (Hahn et al., 2022). Friehs et al. instructed participants to read about placebo effects and self-administer a nasal spray. Although this reading manipulation may be sufficient for deceptive placebos, it may not be an optimal manipulation for non-deceptive ones. These studies suggest that non-deceptive placebos can regulate emotions—however, their effectiveness may be dependent on the features of the manipulation. Future studies should systematically examine what contextual features of the manipulation are important, such as the experimenter’s presence, mode of information delivery, audio/visual cues, or type of placebo object.

Outside the lab, non-deceptive placebos have helped manage daily stressors and chronically stressful periods. El Brihi et al. (2019) showed that taking non-deceptive placebo pills for 5 days reduced emotional distress and physical symptoms and improved mental well-being and sleep quality. During chronic stress periods, non-deceptive placebos manage students’ test anxiety for 2–3 weeks (Kleine-Borgmann et al., 2021; Schaefer et al., 2019)—however, there is insufficient evidence that non-deceptive placebos are effective in affect-related disorders. We are aware of two small sample studies ($n < 20$ per group) that showed trending but nonsignificant decreases in depression symptoms (Kelley et al., 2012; Nitzan et al., 2020). Future large-scale randomized clinical trials (RCTs) should examine whether non-deceptive placebos can reduce affective symptoms in clinical samples.

Fundamental Questions and Directions for Future Research

Harnessing placebo effects to regulate emotions raises many questions. We have identified directions for future research throughout this chapter, and we highlight some additional key questions here. To harness placebo effects to regulate emotions, examining the efficacy and understanding the mechanisms of non-deceptive placebos is essential. Although interrelated, we divide this section into basic and translational science implications.

Basic Science Questions

First, what are placebos doing phenomenologically when regulating emotions? An expectation-based placebo is an appraisal-type strategy that may broadly help interpret an upcoming emotional situation as less severe. Indeed, Guevarra et al. (2020) show that non-deceptive placebos impact neural measures (sustained LPP) involved in the appraisal stages of emotional processing. Yet, taking a pill or nasal spray that people believe will reduce their emotional reactions versus having people cognitively reappraise a situation to reduce their emotional reactions are phenomenologically distinct. Future studies should directly compare non-deceptive placebos with other appraisal-type strategies to understand the important similarities and differences in efficacy, underlying neural mechanisms, and cognitive cost.

Second, how reliable and robust are non-deceptive placebo effects in regulating emotions? Although three lab studies showed positive results, one did not. We pointed out that this may have to do with features of the non-deceptive placebo manipulation. A

related question is how to leverage associative learning mechanisms to enhance non-deceptive placebo effects. In the deceptive placebo literature, placebos that rely on expectations and learned associations produce the most reliable and robust effects. Presumably, non-deceptive placebos that leverage both mechanisms also produce the strongest effects. More research is needed that systematically manipulates different contextual features, such as the source of information, mode of information delivery, type of mechanism, and type of object in non-deceptive placebo research.

Third, a related question is how durable are placebos in regulating emotions? If a person takes a placebo in the morning, does the effect last the entire day? Or does the effectiveness decrease as the day goes on? It is likely that taking placebos does not trigger stable expectations since the act of taking the placebo object is an important element in getting it to work. The placebo object reminds people that a treatment is taking place. However, it is possible to manipulate temporal information. For example, suggesting that the regulatory effect will last for 5 or 20 minutes may impact its durability. Future research should test this intriguing avenue in placebo research.

Translational Science Applications

In terms of translational science questions, we highlight two future directions: First, related to the assumption that non-deceptive placebos may work automatically and with less effort, it is important to examine whether they can work for people who have difficulties with self-regulation and for instances where self-regulation is difficult. For example, studies can examine whether non-deceptive placebos can be effective for younger people with underdeveloped self-regulation capacity or for people with self-regulation impairments, such as those with affective disorders. Moreover, research can investigate whether non-deceptive placebos can work when a person is fatigued or stressed.

A second question is can non-deceptive placebos help manage clinical levels of anxiety and depression? Ethical issues must be considered since people with affective disorders should receive the best treatment. One way around this issue is to first test non-deceptive placebos in samples experiencing subclinical, mild, or moderate levels of anxiety and depression. Another way to conduct studies in clinical samples is to use non-deceptive placebos as co-interventions. For example, future studies can randomly assign people with mild to moderate affective symptoms to a cognitive-behavioral therapy (CBT)-only group or a CBT-with-non-deceptive-placebos group. Large-scale RCTs are needed to determine efficacy, feasibility, and long-term effects.

Conclusion

Placebos are remarkably effective in managing a host of clinical disorders and nonclinical symptoms (Ashar et al., 2017; Benedetti, 2021). But the ethical dilemma that deception is necessary for placebos to work has prevented their widespread use. In a promising new twist, there is evidence that placebos can still work without deception. We are beginning to accumulate evidence that non-deceptive placebos can help regulate acute emotional episodes and manage chronically stressful periods. This opens up using an alternative strategy in which people can outsource regulating their emotions to non-deceptive placebos. Although in its infancy, we believe harnessing the regulatory effects of placebos without deception represents an exciting direction in emotion regulation research.

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SECTION IV

**DEVELOPMENTAL
CONSIDERATIONS**

CHAPTER 14

Developing the Neurobiology of Emotion Regulation

NIM TOTTENHAM

Emotion regulation has been defined as the processes by which individuals influence the occurrence, timing, nature, experience, and expression of their emotions (Gross, 2013). It can include both controlled, explicit processes and automatic, implicit processes with the goal of changing one's own emotional experience (Moreira & Silvers, 2018) to make ourselves feel better or worse (e.g., Tamir & Ford, 2009). Relative to other species, humans are exceptionally skilled at emotional regulation, although the development of this skill requires significant developmental time—that is, young children are typically not very skilled in emotion regulation, and it will take approximately two decades for emotion regulation ability to develop fully. These developmental changes in emotion regulation are paralleled by changes in brain structure and function observed from infancy through young adulthood. This chapter describes the development of the neurobiology that has been most closely linked with emotion regulation across the first two decades of life.

It is reasonable to ask why emotion regulation and the neurobiology that supports it should require such a protracted period to develop. The answer involves the fact that emotion regulation is a very complex behavior. Thompson (1994) has described emotion regulation as involving a multidimensional organization of several components and processes—in other words, emotion regulation is a highly sophisticated process, which therefore requires a complex set of networks in the brain. This complexity and sophistication require a major phylogenetic shift in brain structure and function, which by extension means a phylogenetic shift in brain development (Finlay & Darlington, 1995). Indeed, the late phylogenetic and ontogenetic generation of cortical structures (especially the prefrontal cortex [PFC]) that humans evolved most likely gives us the disproportionately large growth of these structures that support emotion regulation. We could ask, “Why not design the human species so that by age 2 years, adult levels of emotion regulation are already mature?” While this might temporarily ease life for the parents of toddlers in some ways, the alternative—namely, a slow development—affords humans a

highly sophisticated set of processes requiring years of growth, learning, and elaboration that comprise our sophisticated repertoire of emotion regulation behaviors. Moreover, a protracted developmental timeline provides ample opportunity for emotion regulation skills and associated neurobiology to adapt to the unique environments in which each individual develops.

This chapter summarizes the neurodevelopment of emotion regulation across childhood and adolescence and includes the literature from nonhuman animals for cross-species comparisons. Humans can regulate their emotions through either intra- or interpersonal means (Zaki & Williams, 2013). The former has received much more empirical attention and is the focus of this chapter—however, interpersonal emotion regulation is a major (if not the primary) form used early in development, and this chapter also includes discussion of the small, but growing literature on the neurobiology of interpersonal emotion regulation in development.

The neural circuits of emotion regulation that have received the most empirical attention overwhelmingly involve the amygdala and the PFC (e.g., neurosynth.org search: emotional regulation) and the structural and functional connections between them. This is true in both the adult and developmental literatures. Therefore, the amygdala and PFC remain the focus of this chapter as well. (Note that this is not to say these are the only brain regions involved in emotion regulation; see Moreira & Silvers, 2018, for more in-depth coverage of emotion regulation and brain development.)

Amygdala Development

The amygdala is a phylogenetically old set of nuclei seated deep in the temporal lobe. It supports emotional learning (about the relative safety and danger of cues in the environment), arousal, monitoring, and reactivity to emotionally relevant (i.e., either positive or negative) stimuli (see Moreira & Silvers, 2018, for a description). Structurally, the amygdala exhibits relatively early rapid development in primates, both human and nonhuman. The human amygdala already has its basic neuroanatomical architecture present at birth (Ulfig et al., 2003). In both human and nonhuman primates, the amygdala exhibits peak postnatal structural development in the period right after birth (Gilmore et al., 2012; Payne et al., 2010). Magnetic resonance imaging (MRI) has shown that the amygdala exhibits its largest rate of postnatal growth before the infant's first birthday (Gilmore et al., 2012). This early structural development may reflect a readiness of the amygdala to become functional in the first few years of life. Although the rate of growth in the first postnatal year dwarfs any growth observed at later years (Gilmore et al., 2012), the amygdala does continue to exhibit volumetric growth throughout the first two decades of life. For example, growth continues during childhood with notable periods of rapid growth during puberty (Goddings et al., 2014), suggesting that amygdala changes continue to support new needs that emerge across development.

The amygdala has also shown evidence of early functional reactivity. By the pre-school period, amygdala activity typically responds to emotionally relevant and/or arousing stimuli (see Callaghan & Tottenham, 2016; Silvers et al., 2017), with many studies showing that this activity is at a developmental peak in early childhood—that is, the amygdala of an average 5-year-old may be more reactive to emotionally relevant stimuli than that of a 25-year-old. This strong activity in early postnatal life may reflect the outsized amount of emotional learning that occurs at this time relative to other points in life. Note that there may be variation across reported findings that could reflect differences

in task, age range, and populations studied (although analytic methods seem an unlikely reason; see Bloom et al., 2022). Of the few functional magnetic resonance imaging (fMRI) studies that measure infants' brain activity in response to stimuli, the findings indicate that the amygdala does not typically exhibit functionally relevant increases in response to environmental stimuli (e.g., Graham et al., 2013) prior to the first birthday. If this interpretation continues to receive support, it would suggest that although the amygdala is structurally well developed early in life, it starts exhibiting function after the infant period (except in cases of adversity; Graham et al., 2013).

PFC Development

In adulthood, the amygdala has strong bidirectional functional and structural connections with the PFC (see Moreira & Silvers, 2018). The PFC coordinates information from multiple brain circuits (e.g., affective, mnemonic, linguistic, perceptual), including the amygdala, by virtue of its connectivity patterns and/or its cellular composition, and by doing so, plays a large role in regulating the activity of the amygdala (including down-regulating overarousal of the amygdala)—however, these PFC functions are less developed in the young child. Unlike the early development of the amygdala, several studies across multiple species have demonstrated relatively slow development of the connections between the PFC and amygdala (see Figure 14.1). While adult-like regulation is largely mediated via top-down regulation from the PFC to the amygdala, the same is not true during development. For example, in rodents, the PFC is not functionally engaged during the regulation of emotion (i.e., “fear extinction”) during development, and cellular and molecular-level developments (e.g., expression of perineuronal nets and parvalbumin) continue throughout the adolescent period (Baker et al., 2017). Indeed, early in development, the connections between the PFC and amygdala show an absence of the regulatory top-down connections relative to the earlier-developing bottom-up connections (Arruda-Carvalho et al., 2017). This ratio between bottom-up and top-down switches as rat pups transition to adulthood. Evidence from nonhuman primates also supports the hypothesis that bottom-up connections emerge developmentally prior to the adult-like regulatory connections from the PFC to the amygdala (Bertolino et al., 1997). These animal studies indicate that earlier bottom-up connections are important for establishing initial communications between the amygdala and the medial prefrontal cortex (mPFC).

Studies show that the slow development of amygdala–PFC connections that has been identified in rodent and monkey studies has also been observed in children and adolescents—that is, human neuroimaging findings largely suggest a hierarchical developmental course involving subcortical–cortical changes across the first two decades of life (Casey et al., 2016). Functional amygdala–PFC connectivity has been identified starting in the newborn period (Thomas et al., 2019), yet the structural and functional connections between the PFC and the amygdala are slow to fully mature (Gabard-Durnam et al., 2014; Lebel & Beaulieu, 2011; Silvers et al., 2017). The PFC continues to mature after the amygdala, with estimates averaging at least two decades to reach adult-like structural and functional development (Cohen et al., 2016).

During fMRI tasks that require people to regulate their emotions (e.g., they may be asked to reappraise how “bad” an emotional scene is), the lateral PFC shows age-related increases in reactivity from early adolescence through young adulthood when participants decrease negative affect (McRae et al., 2012). The nature of the age-related change (increasing vs. decreasing) varies across studies, with some functional connectivity studies showing that connectivity becomes more positive with age and some showing the

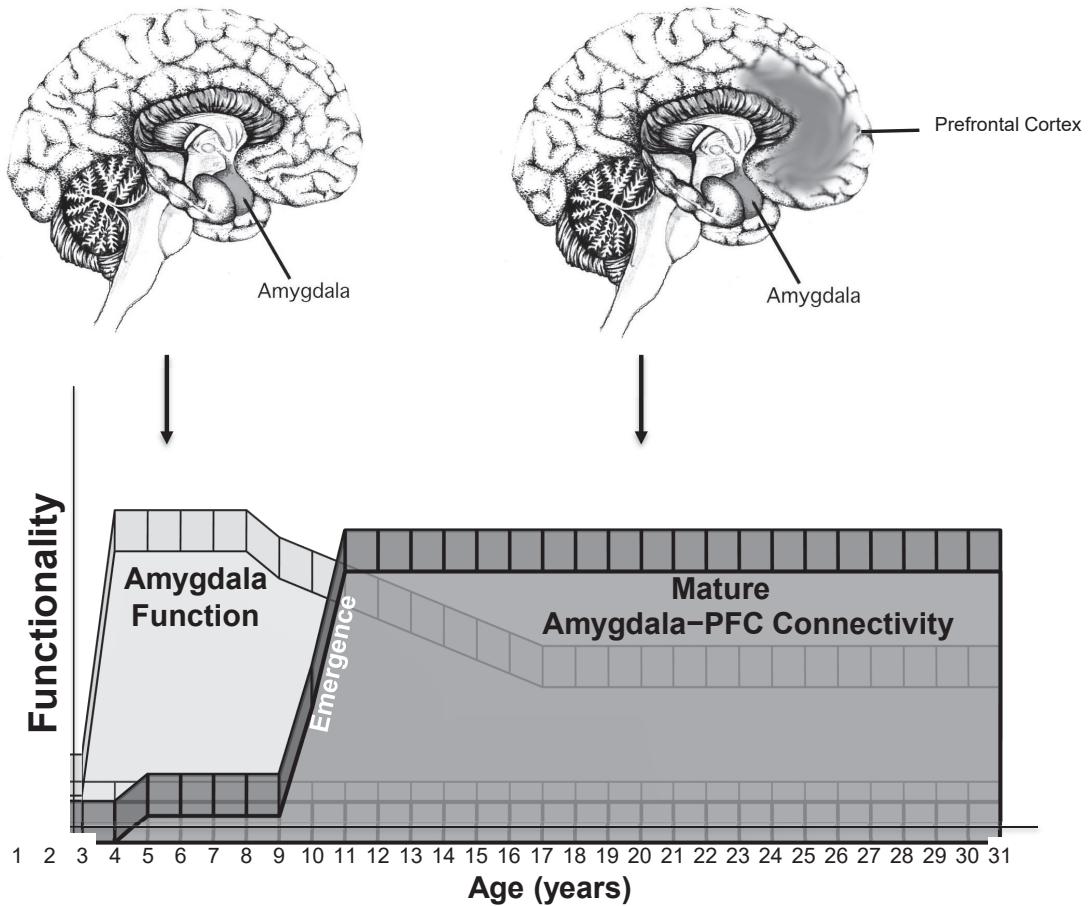


FIGURE 14.1. Schematic of human amygdala–PFC development. From Tottenham (2016), *Social Neuroscience*. Copyright © 2016 Taylor and Francis. Adapted by permission.

opposite. Although sample size has been cited as a reason for inconsistent findings (see Zhang et al., 2019, which showed no age-related change), in reality there are many more sources of variability, including the age range studied, the mental health of the sample, and the method used for analyzing the data (see Bloom et al., 2022). In particular, the nature of the task that the circuitry is performing at the time of assessment is critical in determining directionality (McRae et al., 2012). Note that only a few studies of brain connectivity underlying emotion regulation across development have actually had subjects regulate their emotions while measuring brain activity. Those that have used emotion regulation tasks show an age-related change of an increasing inverse relationship between the amygdala and the PFC (Pitskel et al., 2011). This pattern of increasing PFC activation corresponding with decreasing amygdala activity (and vice versa) is consistent with the regulatory function of the PFC over the amygdala. This pattern was replicated in two separate studies during emotion regulation behavior (Silvers et al., 2015, 2017). Note also that these papers are some of the few that use a behavioral task (i.e., emotion regulation) during measurement of amygdala–PFC function that include children younger than

~9 years old (this is important since age-related changes are more apparent when younger ages are included).

To move beyond association studies, employment of experimental designs that leverage within-subject effects can provide insights into mechanisms of developmental change. For example, experimental manipulation of the PFC via cognitive load showed that amygdala–PFC development is slow across childhood and adolescence and that the nature of communication between the amygdala and the PFC is different in childhood relative to older ages (Gee et al., 2022). This work suggests a shift from bottom-up co-excitatory to top-down regulatory frontal–amygdala connectivity between childhood and adolescence (which had previously been observed in rodents; Arruda-Carvalho et al., 2017). Whereas adolescence was marked by information flow from PFC to amygdala (consistent with the regulatory connections observed in adults), the reverse information flow, from the amygdala to PFC, was dominant in childhood.

Interpersonal Emotion Regulation

Taken together, the fMRI literature suggests that emotion regulation develops slowly, in part because of the slowly developing neurobiology that supports these abilities. While this timeline suggests that infants and children have very little means of emotion regulation when relying on their own facilities (i.e., intrapersonal emotion regulation), early-life emotion regulation may be more likely accomplished via interpersonal processes (Barthel et al., 2018). Interpersonal emotion regulation refers to the regulation of emotions via social interactions. Zaki and Williams (2013) distinguish between interpersonal emotion modulation and regulation by noting that regulation refers to having a goal to alter one's affective state, whereas modulation of affect by social presence can occur outside of any such goal. In this paper we do not make this distinction, since it is not possible to say whether infants and young children have such a goal when they use interpersonal regulation. Although there is very little currently known about the development of the neurobiology underlying interpersonal emotion regulation, we briefly summarize the growing literature here.

Early in postnatal life, parents play an outsized role in regulating their offsprings' emotions. For example, the process of parental buffering is an effective means by which parents can attenuate negative affect and stress reactivity in their offspring (Gunnar et al., 2015). At young ages, parental cues have been shown to decrease amygdala reactivity in children, phasically strengthen connectivity between the PFC and amygdala, and improve self-regulation (Callaghan & Tottenham, 2016; Gee et al., 2014). Thus, buffering via parents is a process that has been identified across altricial species (i.e., those species whose young require caregiving for survival) and provides young with an effective means of protection against strong emotions at a time when their own neurobiology is yet developing (Callaghan & Tottenham, 2016). The high synchrony between parents and children relative to other dyads (Reindl et al., 2018) may facilitate parents' ability to influence their children's emotion regulation neurobiology. Accordingly, research suggests an intergenerational neurobiological association between parents' and children's PFC and amygdala activity during emotion learning (Silvers et al., 2021). In support of this parent-to-child transmission framework, a random control trial has shown that an attachment intervention directed to parents of infants was causally associated with stronger amygdala–PFC connectivity in the offspring when measured at 10 years old (Valadez et al., 2023).

Conclusion

The study of the development of emotion regulation neurobiology has made significant progress within the past couple of decades. The very fact that we can noninvasively assess neural phenotypes in healthy, unsedated children is a tremendous innovation that was unimaginable just a generation ago. Despite the excitement and innovation, there is much more research needed in this area. Adequately powered observational studies examining the neurobiology of emotion regulation are needed (Marek et al., 2022). At the same time, to better understand these developmental changes in neurobiology at the level of mechanism, more studies using experimental design (both within- and between-subjects designs) are needed because manipulation of the neurobiology is the means through which mechanisms and causality can be determined. To better understand the links between early interpersonal emotion regulation and later intrapersonal emotion regulation, research studies should address whether early interpersonal emotion regulation (e.g., parental buffering) causally predicts later-emerging intrapersonal emotion regulation. There is some hint that it might: Callaghan et al. (2019) showed that parentally induced decreases in amygdala activity longitudinally predicted decreased anxiety (across 2 years) in youth with a history of adversity. The prolonged and complex development of emotion regulation neurobiology most likely means that the research will take time, but continued research is critical given the central role that emotion regulation plays in our well-being.

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CHAPTER 15

The Socialization of Emotion Regulation

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The construct of emotion regulation has received considerable attention by developmental science researchers. In this chapter we first focus on conceptual issues, considering the constructs of emotion-related self-regulation and distinctions between voluntary (effortful) aspects of control and more reactive involuntary processes. We then briefly review the relations of socialization practices to children's emotion-related self-regulation, particularly with regard to socialization of emotion in the family. We conclude with a discussion of applied interventions and areas for future research.

Conceptual Issues

Definitions of emotion regulation have varied in the literature. Because both intrinsic and extrinsic factors are involved in emotion regulation, we focus particularly on regulation that involves intrinsic processes (i.e., *self-regulation*). We recognize that it is extremely difficult to differentiate emotionality from its regulation—thus, we focus on the *processes* involved in emotion regulation rather than on the amount of emotion experienced or expressed. We use the term *emotion-related self-regulation* to refer to processes used to manage and change whether, when, and how (e.g., how intensely) one experiences emotions and emotion-related motivational and physiological states, as well as how emotions are expressed (which is why we use the term *emotion-related regulation* rather than regulation). However, some capacities therein may be used to regulate behavior that is not highly tied to emotion. This conceptualization is consistent with Gross et al.'s (2014) model, in which emotion regulation includes situation selection, situation modification, attentional deployment, cognitive change, and response modulation.

Eisenberg and colleagues (2010) have argued that it is useful to differentiate between aspects of control that are willful or voluntary versus involuntary processes. Effortful control is defined as “the efficiency of executive attention—including the ability to inhibit

a dominant response and/or to activate a subdominant response to plan, and to detect errors" (Rothbart & Bates, 2006, p. 129). It typically includes the ability to deploy attention willfully (often called *attention focusing* and *shifting*) and to inhibit or activate behavior (inhibitory control and activational control, respectively). Thus, we see effortful control as the building blocks for the development of emotion-related self-regulation. As a case in point, imagine an individual who is experiencing negative emotions. The person may use attentional processes, such as distraction, to shift attention away from the distressing stimuli, inhibitory control to mask the expression of negative emotions, or activational control to take action to repair the situation that is causing the negative feelings.

On the other hand, reactive control processes pertain to aspects of control (or lack thereof) that are involuntary and are usually automatic and difficult to modulate effortfully—that is, reactive control refers to relatively involuntary approach and avoidance systems. At the extreme level, this construct reflects either overly inhibited behavior (overcontrol) or impulsive behavior (undercontrol). For example, children who are behaviorally inhibited are wary and overly constrained in novel contexts and have difficulty modulating their inhibition. Conversely, children who are impulsive are "pulled" to rewarding or positive stimuli. Extreme levels of reactive control are viewed as less flexible and often less adaptive than is effortful control. However, moderate levels of impulsivity or inhibited behavior may have benefits at some ages or in some contexts. For example, moderate levels of impulsivity have been positively related to children's ego resiliency (Eisenberg et al., 2002).

Aside from their conceptual differences, empirical data support the categorical distinction between effortful and reactive control; they have been found to load on different (negatively correlated) latent constructs and often provide a unique prediction of developmental outcomes (see Eisenberg et al., 2010). In this chapter we primarily focus on top-down (voluntary) emotion-related self-regulation and effortful control, the temperamentally based component of top-down self-regulation.

The Socialization of Emotion-Related Self-Regulation

Given the important role of family in children's lives, parental socialization of emotion-related self-regulation has been a topic of considerable interest for decades. For the purposes of this chapter, we focus primarily on emotion-related socialization behaviors—however, other aspects of parenting, such as the parent-child relationship quality, parenting style and discipline, and parents' own dispositions or psychopathology, have been examined in association with children's emotional competence (Morris et al., 2007).

Parenting behaviors that focus on children's emotions are thought to be particularly relevant to the development of children's emotion-related self-regulation skills. Eisenberg and colleagues (1998) developed a model focused on the processes by which socializers teach children about emotions and ways to manage emotions appropriately (see also Eisenberg, 2020). The authors proposed that caregivers promote children's emotion regulation in three ways: (1) socializers' own expressions of emotions, (2) socializers' responses to children's emotions, and (3) socializers' discussions of emotions with children.

Socializers' Own Expression of Emotions and Regulation

Parents' expressions of emotion are likely related to children's abilities to regulate their emotions and behaviors. General positive or negative emotionality in the home may affect children's emotions through emotional contagion or through imitation and modeling.

Similarly, parents' own emotion regulation (or dysregulation) probably plays a role in the development of children's own regulatory skills. A child who has a parent who is routinely explosive, flies off the handle, and expresses anger regularly is likely to experience heightened negative emotional reactivity, display similar angry outbursts, and respond with dysregulation when distressed (Morris et al., 2007).

Empirical evidence supports the view of children's emotion—emotion-related self-regulation is associated with parents' own expressions of emotion and self-regulation. Research indicates that children and adolescents whose parents are emotionally expressive in the family tend to be emotionally expressive themselves (Halberstadt & Eaton, 2003; Kyeong et al., 2021). In addition, parents' expression of emotions has been related to children's regulation. Parents' positive expressivity has been related to relatively high effortful control/regulation (Speidel et al., 2020; Valiente et al., 2006), whereas expressions of negative emotion (especially anger, hostility) sometimes have been negatively related to children's regulatory skills, albeit findings for negative expressiveness have been less consistent (Valiente et al., 2004, 2006). Maternal clinical depression, characterized by sustained and intense sadness/negative emotions, has been related to children's problems with regulation (Blandon et al., 2008). Parents' regulation has also been positively related to children's regulatory skills. In a recent meta-analysis, Zimmer-Gembeck and colleagues (2022) found a significant effect size ($r = .21, p < .001$) for the positive association between parents' own emotion regulation skills and children's emotion regulation.

Socializers' Reactions to Children's Emotions

Parents' reactions to their children's emotions, especially to their children's negative emotions, provide rich opportunities for socialization of emotion and its regulation. Studies of emotion socialization in infancy and the first few years of life often focus on how socializers respond to and deal with infants' expression of negative emotion, or on the sensitivity of parenting more generally. Caregivers who respond to infants' expressions of emotion in an appropriate manner provide external support for the development of their regulation by meeting the infants' needs. Indeed, caregivers' early sensitivity and responsiveness to their toddlers have been positively related to their later regulation or effortful control (Davidov & Grusec, 2006; Spinrad et al., 2007). Similarly, parents' mutually responsive orientation, reflecting a relationship that is mutually cooperative, has been found to predict greater effortful control (Kochanska & Kim, 2014).

In addition to more global responsiveness, the ways parents respond to their children's emotions offer children valuable information about the experience and expression of emotions. Some responses, such as encouraging the expression of emotion, communicate to children that their emotions are accepted, and children are encouraged to share their emotional experiences. Socializers may also respond to their children's emotions by offering them potential ways to manage their feelings (i.e., emotion-focused coping) or ways to alter the context or situation to make it better (i.e., problem-focused coping). Such parenting strategies encourage children to find ways to manage emotions in the future. For example, when children fall off of their scooter, the parent may allow them to express pain, comfort them to help them feel better, and then take the child to get a bandage for their scrapes. In the future, if the child gets another scratch or scrape, the child has developed strategies to resolve their distress (such as going to get a bandage).

Conversely, if socializers minimize their children's emotions (e.g., "Why are you making this such a big deal?"), or punish children for their emotions (e.g., "If you don't stop crying, you are going straight to bed!"), children receive the message that emotions are unacceptable. In turn, children may feel overwhelmed, react more intensively, or

destructively. Children may also respond to parents' criticism or minimizing of emotions by suppressing or detaching from their emotions in the future.

Consistent with these ideas, researchers have shown that when parents use strategies that foster emotion regulation (i.e., problem solving and emotion focused), as well as encouraging the expression of emotion, children have relatively strong regulatory skills (Davidov & Grusec, 2006; Perry et al., 2020; Spinrad et al., 2007). On the other hand, parents who minimize their children's emotions or who respond punitively to their negative emotions may induce more negative emotion and dysregulation (see Eisenberg et al., 2010; Eisenberg, 2020; Perry et al., 2020).

Socializers' Discussion of Emotion

Socialization of emotion also includes the ways that caregivers discuss emotions in the family. Parents who discuss emotions with their children likely teach them about the meaning of emotions, circumstances in which they should be expressed, and ways to regulate their distressed feelings. A similar concept includes the notion of "emotion coaching," reflected by parental discussion of emotions, validating feelings, labeling emotions, and instructing children on strategies to manage their emotions (Gottman, 1996). Empirical findings indicate that parents who discuss emotions with their children or use emotion-coaching strategies have children who tend to be better regulated (Curtis et al., 2020; Eisenberg et al., 2008; Gentzler et al., 2005). Similarly, sensitive guidance during discussions about emotions (including structure and support of emotions) has been linked to relatively high emotion regulation in a sample of maltreating and nonmaltreating mothers (Speidel et al., 2020).

In sum, research on emotion-related socialization practices has demonstrated that parents' reactions to children's emotions, parents' own emotional expressiveness and/or regulated (or dysregulated) coping, and their discussion of emotions predict children's emotion-related self-regulation (Eisenberg, 2020). Researchers should consider the important role of additional emotion-related socialization practices, such as parents' selection or control of situations to prevent an emotion or stressor from occurring (i.e., arrange situations to be less stressful in ways that prevent an emotional reaction).

Applied Intervention and Areas for Future Research

Although the research is limited, there is recent evidence that parenting intervention programs specifically targeting parental emotion socialization can promote emotion-related self-regulation. As one example, the Tuning in to Kids program is designed to teach parents emotion coaching (Havighurst & Kehoe, 2021). Specifically, parents are taught to pay attention to children's emotions, to view emotions as an opportunity for emotion coaching, to validate and label their children's feelings, and to assist children to find strategies to manage their emotions (i.e., problem solving). In another intervention program designed in the context of child maltreatment, mothers were trained to increase their sensitive guidance during reminiscing—that is, mothers were trained to improve the ways that they discussed past emotional events with their children by discussing the causes, consequences, and resolutions of negative emotions. Results from a randomized controlled trial provided evidence that this program improved children's emotion regulation (Speidel et al., 2020). These programs, and other intervention programs designed to improve parents' emotion socialization behaviors are encouraging for improving

children's emotion-related self-regulation through promoting change in parenting practices (see England-Mason & Gonzalez, 2020; England-Mason, this volume).

The majority of research on the socialization of emotion regulation has been done using North American samples, often with White, educated samples. This research may not generalize to other families, such as children of color, economically disadvantaged, or non-Western cultures. There are undoubtedly differences in how caregivers socialize emotion across diverse families and cultures. Cultural values and norms are likely to dictate caregivers' socialization goals, norms, values, and beliefs about emotions. In addition, cultural factors may moderate the relations of emotion-related socialization behaviors to children's regulation and other developmental outcomes (see Eisenberg, 2020).

An important area for future research involves how caregivers of historically marginalized children socialize emotion in the context of racism and discrimination—that is, differences in parents' emotion socialization behaviors may be in response to racism or in efforts to protect children. As a case in point, in their integrative model of racial and emotion socialization (IMRES), Dunbar and colleagues (2017) note that Black parents engage in *emotion-centered racial coping* socialization strategies. These behaviors refer to a balance of discussions about race, emotion-validating, and emotion-suppressing practices that help promote children's emotion regulation skills. Thus, developmental scientists must acknowledge that some behaviors that may be adaptive for some racial groups might operate differently in other environments. It is critical to address the gaps in our knowledge and interpretations of findings about the socialization of emotion and emotion regulation in culturally sensitive ways to more accurately understand the development of emotion-related self-regulation among youth of color.

It is also important to acknowledge that parenting does not necessarily relate to regulatory outcomes for all children equally. The interplay between children's characteristics and their family environment must be considered. From the perspective of differential susceptibility, individuals may vary in the extent to which they are susceptible to environmental influences—that is, for more susceptible children, their environments are thought to impact them "for better and for worse." Researchers are still identifying factors that may serve as markers of susceptibility, such as temperament, genetics, or physiological reactivity (Ellis et al., 2011). This research has important implications for intervention programs and for our understanding of the socialization of emotion-related regulation.

Additionally, researchers should consider how the role of socializers may change with development. The types of strategies parents use to assist children's emotion-related regulation undoubtedly change with age, as children's own self-regulatory skills improve (Spinrad et al., 2004)—that is, as children get older, parents may engage in less comforting and distraction in favor of more sophisticated strategies, such as talking about emotions and brainstorming ways to handle distress in the future. Not only are parents' strategies likely to change with age, but the relations of socialization to children's emotion-related self-regulation might weaken as children's social contexts broaden outside of the family.

Furthermore, children can evoke certain parenting reactions and that the process of influence between socializers and children's emotion-related self-regulation is likely bidirectional—that is, children who are dysregulated or fall apart when challenged may elicit reactions from their environment, such as hostility, negativity, harsh control, or ineffective parenting. Indeed, there has been some evidence that parenting behaviors are predicted by children's self-regulation (Li et al., 2019). These relations could be transactional such that parents' and children's behaviors/emotions influence each other during interactions and across time.

Finally, research on contexts outside of the family, such as peers, neighborhoods, and schools, must be considered with regard to the socialization of emotion regulation. Valiente and colleagues (2020) posited that teachers' and peers' social and emotional functioning, their emotion-related interactions with teachers and peers (i.e., reactions to emotions, relationship quality), and the classroom context are critical factors in the socialization of children's emotions and emotion-related self-regulation. Additional research on the roles of multiple sources of socialization on children's regulation is needed.

Conclusions

In the past several decades, it has become clear that children's self-regulation is an important development in childhood. In this chapter, we focused on some aspects of how socialization in the home might contribute to the development of children's regulation. It is also critical that researchers continue to design programs to foster emotion-related self-regulation both inside and outside the home. More research should be done in this domain, with particular attention to how socialization strategies and emotion regulation function across various diverse communities.

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CHAPTER 16

Emotion Regulation in Adolescence

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Adolescence is the transition period from being a child to being an adult. It starts with the onset of puberty, which is the physical transformation toward being capable of sexual reproduction. Hormonal changes of puberty typically begin by 9–12 years of age in girls, and on average 1.5 years later in boys (Steinberg, 2016). Adolescence is often defined as ending with the assumption of adult roles, such as earning one's living and managing one's own household. In Western societies, however, this is often delayed until around the early-to-mid-20s, and it has been argued that a phase of emerging adulthood should be distinguished during which young individuals are no longer adolescents but have not yet fully assumed adult responsibilities (Arnett, 2019). Reaching the legal age of maturity may thus be the better marker of leaving adolescence.

Adolescence is characterized by dramatic changes. These include the physical transformation from a child-like into an adult-like body and marked cognitive growth, as well as profound social reorientation away from the family toward peers and first romantic or sexual partners. Associated is a profound increase in the likelihood of encountering emotionally challenging situations. Pubertal body changes can elicit embarrassment or pride, and yield increasingly demanding social expectations to not only look, but also behave, like an adult. Adolescents' cognitive growth allows greater engagement with fundamental, and often emotionally intense, aspects of one's own and others' existence and future. The social changes of adolescence also bring about strong emotional experiences, deriving, for example, from increased potential for conflict with parents; greater sensitivity to, and concern about, peer relationships and the opinion of others; and first romantic and sexual experiences (Coe-Odessa et al., 2019).

The Role of Emotion Regulation for Adolescents' Socioemotional Adjustment

Emotion regulation skills play a key role in adolescents' ability to weather the developmental challenges they face. While most adolescents adapt well, those with weak emotion

regulation abilities may be overwhelmed. This is reflected, for example, in a sharp increase during adolescence in the prevalence of depressive, anxiety, and eating disorders, which have impaired emotion regulation in common (Rapee et al., 2019). A national survey of U.S. adolescents, for example, yielded estimated risks of developing a first-time depression between the ages of 12 and 17 years of 36.1% for girls and 13.6% for boys (Breslau et al., 2017). Adolescents with such socioemotional disorders are less effective in reducing negative affect, and engage different neural circuitries when trying to do so, compared to healthy adolescents (see Picó-Pérez et al., 2017; Young et al., 2019, for overviews). They are also more likely to use maladaptive, and less likely to use adaptive, strategies when dealing with emotional situations (see Schäfer et al., 2017, for a meta-analysis).

Maladaptive strategies have cognitive, social, or other costs that may outweigh their emotion regulation benefits, which are often limited. Examples are avoiding situations that elicit undesired emotions, thus restricting one's range of activities and forgoing the chance to learn how to cope, or ruminating—that is, repetitively pondering a problem without trying to resolve it. Adaptive strategies, in contrast, have fewer costs and are more effective. Examples are positive reappraisal—that is, finding the positive side of a difficult situation, or nonjudgmental acceptance—that is, embracing one's emotions without evaluating them or oneself for having them.

Problems regulating one's emotions are not only a symptom of adolescent socioemotional disorders, they are also among the causal factors. Research shows that impaired emotion regulation during childhood is a risk factor for adolescent onset of psychopathology, as well as for subsequent increases of socioemotional symptoms (e.g., Schneider et al., 2018). There is also evidence that maladaptive emotion regulation styles are among the reasons why children who experience early-life adversity, such as parental conflict, neglect, or maltreatment, are at a greater risk of developing psychopathology as adolescents (e.g., Stikkelbroek et al., 2016).

Emotion regulation is related to better adjustment also in psychologically healthy adolescents. For example, emotion regulation skills of healthy adolescents are associated with higher social competence, more prosocial behavior, better academic achievements, higher emotional well-being and self-esteem, and fewer behavioral problems, such as aggressiveness. Emotion regulation has also been related to more peer acceptance, higher peer status, and a lower likelihood of experiencing chronic victimization and bullying by peers (see Buckley & Saarni, 2009, for an overview). Insight into the development of emotion regulation skills during adolescence and into factors that influence the individual differences therein, can thus help understand and support positive development in adolescence.

Nonlinear Refinement of Emotion Regulation Skills During Adolescence

On average, emotion regulation skills are more refined when individuals leave adolescence compared to when they enter it. For example, by late as compared to early adolescence, individuals are typically better able to control their emotions with given regulatory strategies (e.g., Theurel & Gentaz, 2018) and have a broader and more sophisticated repertoire of emotion regulation strategies (see Zimmer-Gembeck & Skinner, 2016, for an overview). For instance, older as compared to younger adolescents are more likely to use cognitive strategies to deal with difficult situations, such as positive reappraisal, and to engage in active problem solving—that is, try to analyze and alter difficult situations (e.g., Eschenbeck et al., 2018). Their strategy choices are also often more flexible.

Compared to younger adolescents, they more often use strategies that are most likely to be effective for a given kind of stressor, such as active problem solving when dealing with modifiable difficulties versus distraction when dealing with uncontrollable stressors, such as parental illness (Zimmer-Gembeck & Skinner, 2011).

This adolescent refinement of emotion regulation skills, however, is not necessarily linear, and the pattern of adolescent change in emotion regulation skills can vary between individuals. Many adolescents, for example, undergo a period of temporarily lowered emotion regulation capacity. This is reflected, for example, in a peak of using potentially maladaptive regulation strategies in early to mid-adolescence, such as avoidance, rumination, or verbal aggression (e.g., Cracco et al., 2017). Also, there is often a transient period of instability in emotion regulation competence, where adolescents fluctuate in their emotion regulation skills, oscillating between higher and lower control over their emotional experiences. Evidence also suggests that different facets of emotion regulation may not improve at the same rate during adolescence. For example, more frequent use of maladaptive strategies has been observed in adolescents who were already more effective in following instructions to regulate their emotion (Theurel & Gentaz, 2018). Such transient periods of emotion regulation difficulties are thought to be among the reasons why adolescents, on average, and compared to children and adults, report more frequent negative emotions, react more strongly to emotional events, and fluctuate more intensively in their emotional experiences (see Coe-Odess et al., 2019, for an overview). Yet there are differences between adolescents with regard to whether, and if so, to what extent, they experience transitory difficulties in emotion regulation, raising the question of which factors influence emotion regulation in adolescence.

Influences on Emotion Regulation in Adolescence

Across the lifespan, emotion regulation skills are shaped by complex interactions between multiple influences. Many of these factors—such as genetic disposition, temperament, or gender expectations—are not specific to adolescence. Generally, three main groups of influences can be distinguished: biological, contextual, and individual factors. The following discussion selectively focuses on adolescent-specific nuances for one example from each of these three groups of influences, exemplarily addressing the roles of neurobiological maturation, parental emotion socialization, and adolescents' emotional preferences.

Neurobiological Influences

Adolescent neurobiological maturation is exemplified, among other processes, in the elimination of unused neural connections, increased sensitivity of synaptic information transmission, and improved connectivity between brain areas. As a result, adolescents' brains function increasingly efficiently. This maturation, however, does not occur at the same time and pace for all brain areas and connections between them. Various researchers argued that differences in the maturational timing between brain systems are among the reasons why transient periods of emotion regulation instability may occur during adolescence (e.g., Casey, 2015; Shulman et al., 2016; Ernst, 2014).

While these researchers differ in specific assumptions, they converge on the ideas that emotion regulation involves the interaction between a subcortical brain system subserving affective experience and a prefrontal brain system subserving the ability to exert control over one's mental states, and that the former matures earlier than the latter during

adolescence (see also Tottenham, this volume). A transient period of neurobiological maturational imbalance can result, during which the earlier-maturing affective system may be temporarily relatively more influential on adolescents' experience and behavior than the later-maturing cognitive-control system.

During this period, adolescents should be increasingly susceptible to seek and experience intense affective experiences, but at a time when their cognitive-control capacity has not yet equally grown. As a result, adolescents' ability to effectively regulate their increasingly intense emotions may be temporarily impaired. While these ideas have received some empirical support (see Ahmed et al., 2015, for a review), the assumed direct mapping of distinct brain regions and circuits on adolescents' emotion regulation may be too simplified (e.g., Pfeifer & Allen, 2016). Thus, while it is undisputed that neurophysiological maturation influences adolescent emotion regulation, the specific physiological processes are not yet completely understood.

Parental Emotion Socialization

Emotion socialization—learning from other people about emotions and how to deal with them—starts early in life and plays a foundational role for emotion regulation development (see also Spinrad & Eisenberg, this volume). Although extra-familial influences, such as peers or media, gain in importance during adolescence, parents remain the primary socialization agents (e.g., Miller-Slough & Dunsmore, 2020). For example, their own responses to emotional situations serve as a role model for emotion regulation, increasing the likelihood that their children will show similar reactions in comparable situations (see Morris et al., 2017, for a review). Parental practices at times when their children are faced with emotional challenges also impact emotion regulation development. While direct soothing and directive guidance of what to do are beneficial for younger children, they may intrude on adolescents' autonomy striving. In consequence, adolescents might pull away from, rather than turn toward, their parents in times of emotional crisis, unless parental practices are adjusted.

More suitable in adolescence is indirect support of autonomous emotion regulation, such as through interest in, as well as awareness and nonjudgmental acceptance of, adolescents' emotional experiences, and being available when the adolescent wants to talk (e.g., Van Lissa et al., 2019). Relatedly, a positive emotional family climate—reflected in emotional acceptance, warmth, and responsiveness—is also beneficial for adolescents' emotion regulation development. In contrast, parental messages that adolescents' emotional experiences are inaccurate, insignificant, or unacceptable (i.e., emotional invalidation) foster emotional suppression and are associated with an increased risk of adolescent emotion regulation problems (Herd et al., 2020).

Adolescence involves various challenges for parental emotional socialization. One of these is to adequately balance adolescents' opposing needs for autonomy on the one hand and for guidance and structure on the other. Imbalance in either direction can have disadvantageous effects. Adolescents who remain overly dependent on their parents for emotional support are at a higher risk of internalizing problems, such as anxiety or depression, while adolescents who lack or refuse emotional support from their parents have a higher risk for externalizing problems, such as delinquency or aggression. Emotion regulation difficulties are among the underlying mechanisms for both of these effects (Morris et al., 2007).

Another challenge derives from the fact that adolescents' autonomy assertions are often associated with a temporarily increased frequency of conflict within the family and

can be a source of parental frustration or irritation. As a result, parents may be more susceptible to negative parenting practices, such as nagging or yelling, with the discussed negative implications for adolescent emotion socialization. Evidence indeed reveals elevated levels of negative parenting in early to mid-adolescence, which, however, typically decline afterward. More disruptive to adolescents' adaptive emotion regulation is the less frequently observed pattern of persistently high levels of negative parenting throughout adolescence (Herd et al., 2020).

Emotional Preferences in Adolescence

In addition to biological and social influences on emotion regulation, adolescents themselves play an active part. This is reflected, for example, in their emotional preferences—that is, in how they want to feel. People mostly strive to optimize their emotional well-being. This is the case in adolescents as well, but their hedonic orientation, on average, is less pronounced compared to children (Gentzler et al., 2021) and adults (see Riediger & Luong, 2016, for an overview). Adolescents also report contra-hedonic motivation more frequently than adults—that is, adolescents are more inclined to occasionally dwell on or intensify negative emotional experiences, or to lessen positive ones. A possible explanation is adolescents' increased propensity to experience mixed affect—that is, to feel good and bad at the same time. This might motivate them to seek or maintain an apparently negative feeling because of the positive aspects they associate with it, for instance, when they enjoy being sad (Riediger et al., 2014). Occasional contra-hedonic motivation might also be instrumental in tackling the developmental tasks of adolescence. Repudiating hedonic conventions, for example, might help adolescents to establish emotional autonomy, affirm a sense of maturity, develop their sense of identity, and refine their competencies of dealing with negative experiences (Riediger & Luong, 2016).

The adolescent-typical peak in negative emotional experiences and reactivity might thus not solely be reactive, but to some extent also actively sought. Indeed, depending on their emotional preferences, adolescents with already refined cognitive-control abilities, which should enable them to effectively regulate their emotions, have been found to differ in the extent to which they react to daily hassles with elevated negative affect: They showed lower emotional reactivity to hassles when they strongly endorsed wanting to feel good, but reported elevated negative affect after hassles—despite good cognitive-control abilities—when being less hedonically oriented (Klipker et al., 2017).

Outlook

The adolescent transition from childhood toward adulthood brings about many emotional challenges. These provide developmental stimulation, but can also increase adolescents' vulnerability to adaptational difficulties. Emotion regulation plays an important role in how well adolescents cope with these challenges. Insights into adolescent emotion regulation and the factors that influence it, thus, have important practical implications. In the future, more attention should be paid to the respective roles of adolescents' pubertal status, timing, and tempo, which vary substantially between adolescents of the same age. Also, more long-term longitudinal research is necessary to better understand how adolescent emotion regulation is shaped by influences during infancy and childhood, and how it impacts the individual's later development and aging. Finally, more work is needed to translate the available scientific insights into practical tools to support positive youth development, and to investigate their feasibility and effectiveness.

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CHAPTER 17

The Role of Selection and Motivation in Emotion Regulation in Later Life

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When asked about emotions experienced in recent days, weeks, or months, older adults reliably report fewer negative emotions than middle-age and younger adults across virtually all negative emotions, such as anger and worry, along with lower levels of perceived stress (e.g., Stone et al., 2010). In longitudinal studies, negative affect reliably decreases from early adulthood into late life (e.g., Charles et al., 2001; Carstensen, 2021). Moreover, when declines in well-being do occur at advanced ages, they are generally small in magnitude and better predicted by closeness to death than chronological age (Gerstorf et al., 2008). Even during the first few months of the COVID-19 pandemic, with its associated mortal threats and social restrictions, older age was systematically related to relatively lower levels of psychological distress (Carstensen et al., 2020). Older age is also related to greater stability of emotional experience. For example, at older ages, less variability in levels of negative and positive affect is observed (Röcke et al., 2009; Carstensen et al., 2000, 2011). Findings such as these have led researchers to ask how older people regulate emotions in ways that contribute to preserved and often enhanced emotional well-being in later life.

Curiously, despite substantial evidence for age-related gains in emotional experience, there is little evidence for age advantages in regulating emotions once they are elicited. In experiments where emotions are induced and participants are explicitly instructed to regulate them (see Sims et al., 2015), by and large, age differences are not observed. Also, when older adults talk about being lonely or are asked to remember sad situations, physiological responses are as strong (Levenson et al., 1991) and sometimes stronger compared to younger adults (Ong et al., 2012). Other studies find that age differences vary by emotion (e.g., Shiota & Levenson, 2009; Kunzmann & Thomas, 2014), with the age relevance of the eliciting stimulus influencing the findings (e.g., Wieck & Kunzmann, 2015), along with the type of regulation strategy under investigation. Overall, the literature suggests that older and younger adults are comparably effective when down-regulating emotions.

Controlled experiments offer important insights into emotional reactivity and recovery by pointing to ways that people react to specific emotional stimuli. Of course, high levels of emotional well-being may not reflect the effectiveness of emotion regulation per se (e.g., Consedine, 2011). Instead, well-being may be explained by older people having fewer stressors in their daily life. People employ a broad range of responses aside from those typically studied by emotion researchers, including avoiding or removing themselves from emotion-eliciting situations. Below, we consider findings about age differences in emotional experience and emotion regulation based on experiments, daily diary studies, and experience sampling studies. We conclude that evidence suggests that older adults regulate their emotions largely by selecting environments that support well-being.

Motivations and Emotional Well-Being

Socioemotional selectivity theory (SST) accounts for improvements in emotional well-being across adulthood as a function of changing goal priorities (Carstensen, 2006, 2021). According to SST, social motivation most often reflects exploration (e.g., new learning) or emotional meaning and satisfaction. Time horizons influence the relative importance of these motivations. Long and nebulous time horizons are associated with a high priority placed on exploratory goals. In contrast, emotional meaning and satisfaction goals are prioritized when time horizons are constrained. Because time horizons are intrinsically related to place in the life cycle, aging tends to be related to an increasing priority placed on emotionally meaningful goals. As a result, older adults attend to, appraise, and remember the emotional aspects of their environment more positively than younger adults (Carstensen & Turk-Charles, 1994; Charles et al., 2003).

Goals direct cognitive resources, not only influencing preferences and decisions but what people see, hear, and remember. As people age, a negativity bias long presumed to be universal (Baumeister et al., 2001) morphs into a positivity bias, a developmental shift referred to as the “positivity effect.” Note that the positivity effect does not refer to positive emotional experiences per se but rather to the deployment of cognitive resources in the service of emotionally meaningful goals (Carstensen & DeLiema, 2017). Although favoring positive information in cognitive processing likely contributes to positive emotional states, note that it is not operationalized as a response to negative emotions—rather, it refers to a preference for positive information in cognitive processing. Theoretically, a focus on positive information can function as antecedent emotion regulation. Compared to younger and middle-age adults, older adults attend to and remember more positive and less negative stimuli. They also appraise situations in the lab and in daily life as less negative and more benign, and remember events from their past more positively than younger adults (see Charles & Carstensen, 2010, for a review). Simply, when people see, hear, and remember positive aspects of life, they are more likely to feel good than when they attend to negative aspects of life.

Motivations and Emotional Experience in Daily Life

Selectivity in social behavior also contributes to well-being. The most common stressors requiring emotion regulation in the United States are interpersonal conflicts, and the most common positive uplifts reported in daily life are positive social experiences with others. Research has shown that older and younger adults who perceive the future as

limited, prioritize time with emotionally close friends and family members over novel social partners, and because aging is negatively associated with time left in life, as people grow older, close friends and family members are especially preferred, familiar, and valued.

Older adults report more positive emotional experiences with their close partners than younger adults, and they report a greater likelihood of de-escalating or purposely ignoring tense situations that may turn into disagreements more often than younger adults (Sorkin & Rook, 2006; see Charles & Carstensen, 2010; Rook & Charles, 2017, for reviews). Older adults report less social conflict than younger adults and prefer to handle potential arguments with strategies directed at de-escalating the situation. These behaviors are powerful antecedent strategies for avoiding potential conflicts, referred to as situation selection and situation modification strategies in the process model of emotion regulation. When conflict arises, older adults tend to engage in behaviors that reduce their negative impact. For example, in laboratory-based studies where married couples discussed a source of disagreement, older couples expressed fewer negative feelings (such as defensiveness and whining) and more affection than middle-age couples (Carstensen et al., 1995). The same age-related patterns were observed in a sample of married couples that were followed over a 14-year period (Verstaen et al., 2020). Thus, selection occurs in both cognitive processing and social behavior.

Actively Modifying Emotional Experience

Older adults report fewer daily stressors in their lives than younger adults. Although retirement and the related freedoms it brings may reduce the likelihood of encountering stressful situations, preferences for positive over negative emotional states also influence how people navigate their daily lives. An experience sampling study that included adults from 20 to 79 years old examined reports of minor daily stressors (Neubauer et al., 2019). Five times a day for 1 week, people were asked whether they had experienced anything stressful, and if not, the reason a stressful event had not occurred. Older adults were twice as likely as younger adults to report that they had handled situations before they became stressful, indicating an age-related increase in the use of proactive emotion regulation strategies to handle potential hassles of daily life.

In daily life, older people report reliably better emotional states. Interestingly, when people do experience significant distress, especially in situations that elicit high levels of physiological arousal, age advantages in emotional experience are sometimes reduced or eliminated (Charles, 2010). The theoretical model of strength and vulnerability integration (SAVI), which incorporates SST, argues that the principle advantages in emotion regulation conferred by age lie in the knowledge and skills that allow people to avoid highly arousing situations that demand down-regulation. Age-related reductions in homeostatic processing presumably make the active regulation of strong emotions more taxing. Once older adults no longer experience high levels of distress, however, they return to deployment of cognitive resources in the service of emotional goals described by the positivity effect. In tightly controlled laboratory studies where participants are systematically exposed to stressors, age differences are usually eliminated. In daily diary studies, although older people report fewer stressors, when they do report them, age differences in responses to those stressors are relatively small. In one experience sampling study, researchers found that age differences were dependent on the time that elapsed since the stressor occurred. Immediately after a reported stressor, age was unrelated to negative

affect—however, when sampled 10 minutes after the event, older ages were related to lower levels of negative affect (Scott et al., 2017). This is, arguably, the best evidence for improved regulatory skills in older people.

Daily diary and momentary sampling studies that record people's emotional experiences and regulatory strategies in close proximity to stressors find more similarity than difference by age. Age is unrelated to the use of suppression and cognitive reappraisal—for example, when regulating negative emotions (Benson et al., 2019). Age is also unrelated to how often people engage in interpersonal emotion regulation, defined as turning to others for support and comfort to regulate their own emotions (Liu et al., 2021). Thus, older people systematically use and deploy similar strategies for regulating distress than their younger counterparts. The one consistent finding in daily diary studies, however, is that age is linearly and negatively related to the number of reported stressors in daily life, consistent with findings about social selectivity (e.g., Almeida et al., 2022).

Future Directions in Age and Emotion Regulation Research

As the above review indicates, the past few decades have offered important insights into whether and how emotions are regulated in later life. To the extent that high levels of emotional well-being and satisfying social relationships reflect emotion regulation, older adults are clearly effective—however, when researchers have focused on mechanisms, findings provide mixed evidence for age advantages in regulation. Laboratory studies examining age differences in emotion regulation find that older age is not uniformly associated with superior modulation of elicited emotional states. We expect that the social context in daily life plays a systematic role in improvements in emotional well-being with age. We also expect that shifts in chronically activated goals and broad motivational changes associated with perceived time horizons that focus attention on positive stimuli and away from negative stimuli contribute to emotional well-being. Below we discuss specific areas for future inquiry in this ongoing research.

Broadening the Study of Emotion Regulation Beyond Stress Reactivity

There is considerable reason to conclude that effective emotion regulation in late life rests heavily on selection, which capitalizes on knowledge gained through lived experience that allows people to know what and whom to avoid and approach, coupled with increasing value placed on making the most of time left in life.

Older adults report that they actively avoid negative situations, and when they cannot do so, they attempt to mitigate their exposure to situations that cause distress. One challenge for researchers then is to identify ways that people navigate daily life in ways that allow them to avoid stressors. Like emotions, behaviors are often automatic, and those that reduce distress are often implemented without labeling them as emotion regulation strategies. For example, avoiding or deftly redirecting conversations away from hotly charged political topics fall conceptually into the category of selection-based antecedent emotion regulation, yet go unmeasured in research on emotion regulation.

Goal-directed cognitive processing in daily life is even more elusive, as it operates at a subconscious level. The positivity effect in cognitive processing refers to well-documented observations in laboratory studies that older people attend to and process positive stimuli more deeply than negative stimuli. This preference in attention and memory likely contributes to high levels of well-being not by “regulating” or even

anticipating negative emotions but rather by seeing beauty in the world. With one notable exception (Neubauer et al., 2019), studies of age differences in emotion regulation focus on *responses* to negative stimuli as opposed to understanding age differences in what researchers label proactive strategies, but what older adults employ often without conscious intention.

Understanding Goal Conflicts and Environmental Demands

Emotion regulation serves both hedonic and instrumental goals (Tamir, 2016). Contrahedonic goals may include suppressing facial expression when a friend or family seeks your advice, or seeking other social, informational, or eudemonic goals, such as engaging in purposeful tasks. For example, suppression is typically viewed as a maladaptive strategy because it does not quell internal states. Yet, people may sometimes suppress emotions for the benefit of others and, relatedly, to regulate the emotional status of an interpersonal exchange. Younger and older adults may suppress their emotions for different reasons, yet no study to our knowledge has examined age differences in the situations and motivations related to emotional suppression in daily life.

There may be instances when competing goals lead older adults to seek experiences that elicit negative emotions. Some people stay current with international and national news, even when such topics as civil unrest and war crimes elicit negative emotions. In addition, serving instrumental goals may be accompanied by frustration, fear, and irritation. For example, a difficult physical therapy program or learning to play a musical instrument may entail short-term emotional costs, but these emotional costs may be accepted as necessary for longer-term health and well-being. Other challenges may help people maintain a high purpose in life, and purpose in life is related to better health (Musich et al., 2018). Finally, reminiscing about the past may elicit sadness, and older adults report more frequent experiences of poignancy (defined as a mix of emotions that includes both sadness and happiness) than do younger adults (Larsen et al., 2021; Schneider & Stone, 2015). For most people, remembering the people and places that have mattered in their lives are worth the poignant tinge of negative emotions—indeed, they may represent the richest of human emotional states. Understanding successful regulation requires integrating not only whether people can regulate their emotions but times when accepting and actively recruiting negative emotions are intentional and meaningful.

Conclusion

Older adults report high levels of well-being, a finding that has long puzzled researchers given the many losses that come with age. Because high levels of well-being are often associated with effective emotion regulation strategies, much research to date has focused on age differences in the ways that people actively regulate negative emotions. Interestingly, there is relatively little evidence for age differences in strategy deployment or effectiveness. Current theories and research in adult development instead point to different explanations that rest on selection and motivation. Older people appear to select social partners and situations more carefully than younger people in ways that allow them to avoid high levels of stress and conflict. In addition, motivational changes that prioritize meaningful experiences allow for greater acceptance of mixed emotional states combined with goal-directed cognitive processing that focuses attention and memory on the good in life more so than the bad.

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SECTION V

SOCIAL ASPECTS

Interpersonal

CHAPTER 18

Interpersonal Emotion Regulation

KAREN NIVEN

You bump into a close friend while out for a walk and notice that your friend seems distracted and upset. What do you do? You might pretend all is OK and exit the conversation, but the chances are you don't—you most likely stay and try to make them feel better. This act of attempting to change the way someone else feels is referred to by psychologists as *interpersonal emotion regulation*.

Until 15 or so years ago, the fact that people try to influence others' feelings seemed to escape the notice of researchers of emotion regulation, whose attentions focused on the control of one's own feelings—however, scholars have become increasingly interested in understanding how people manage the feelings of others. The research that has developed in this area provides compelling evidence that the seemingly small behaviors we use to shape others' feelings can make a big difference to their lives—and to ours. This chapter looks at what we currently know about interpersonal emotion regulation, with a focus on which behaviors you should use to attain the best results.

A Framework for Examining Interpersonal Emotion Regulation

Interpersonal emotion regulation encompasses all and every attempt that a person might make to influence the feelings of someone else (Niven, 2017). This includes attempts to make others feel worse (e.g., making your partner feel guilty for neglecting chores), as well as better (e.g., trying to reduce the anxiety of a stressed coworker). It also includes attempts to elicit new feelings and to intensify, reduce, or maintain current feelings. While the term *interpersonal emotion regulation* has been used by some researchers (e.g., Zaki & Williams, 2013) to also include attempts to influence one's own emotions via social means (e.g., venting to a friend), in this chapter, our focus is solely on attempts to shape the feelings of others. We call the person doing the regulation the *regulator*, and the person receiving the regulation attempt the *target*.

So how do people go about influencing others' feelings? In an early study in the area, my collaborators and I conducted a series of investigations asking people to describe how they had tried to make others feel better or worse, or feel more or less of specific emotions like anger, sadness, and happiness (Niven et al., 2009). We found that our participants collectively identified almost 400 distinctive ways to manage others' feelings, around half of which were strategies to make others feel better and half to make others feel worse.

These strategies can be meaningfully organized into types, based on what the strategies are seeking to transform to elicit the intended change in emotion. This idea originates from our initial research project, where an independent group of participants sorted the strategies we generated based on their judgments of similarities and differences. A key type of strategy identified through this process was *relationship oriented*. Relationship-oriented strategies place the relationship between regulator and target as the central concern; a change in the target's emotions is achieved through transforming their perception of the relationship. In the case of trying to improve someone's feelings, such strategies typically involve "socioaffective support" behaviors (Rimé, 2009) that communicate validation and care (e.g., giving a hug). When trying to make someone feel worse, relationship-oriented strategies signal invalidation and lack of care (e.g., sighing impatiently).

The idea of different strategy types has since been developed in research by Laura Little and colleagues (2016), building on Gross's (1998) seminal work on emotion self-regulation strategies and a typology from the coping literature (Lazarus & Folkman, 1984), which proposed two further categories of strategies: *problem oriented* and *emotion oriented*. Little and colleagues explain that some strategies function by transforming the situation that caused the target to feel a certain way (e.g., removing someone from a hostile environment) and via this transformation the strategies change emotion; hence these strategies are problem oriented. Changing how the target thinks about the situation that caused their emotion (e.g., helping someone to see a problem from a different perspective) can also be classed as problem oriented. While this process does not change the problem itself (meaning that some scholars in the adjacent coping literature class this strategy as being emotion oriented, e.g., Carver et al., 1989), the problem is altered in the mind of the target, so the transformation that prompts a change in emotion is problem oriented. In contrast, strategies that function by directly seeking to elicit a change in emotion, without trying to transform the problem or the relationship, are emotion oriented. Emotion-oriented strategies include trying to manage the target's expression of emotion (e.g., telling someone to "cheer up"), trying to distract the target (e.g., using humor), and trying to change how the target thinks about their feelings (e.g., normalizing unpleasant emotion).

Table 18.1 presents the different approaches to interpersonal emotion regulation, alongside example strategies to illustrate each approach.

Effects of Interpersonal Emotion Regulation Strategies

If you want to influence someone's feelings, we now know that you have literally hundreds of strategies to choose from: What do you go for? Given that the strategies fall into the three categories outlined above—problem oriented, emotion oriented, and relationship oriented—it seems plausible that we might anticipate differences in effectiveness between these types. Below, we discuss the evidence on which of these types of strategies work best across different types of outcomes.

TABLE 18.1. Approaches to Regulating Others' Feelings

Interpersonal emotion regulation approach	Derivation	Description	Strategy types	Example of emotion improving	Example of emotion worsening
Relationship oriented	Niven et al. (2009) relationship focused; see also Rimé (2009) socioaffective support literature	Strategies that seek to influence others' feelings by transforming target's perception of <i>the relationship between regulator and target</i>	<ul style="list-style-type: none"> Socioaffective strategies (communicating a message of validation/care or invalidation/lack of care) 	<ul style="list-style-type: none"> Giving a heartbroken friend a hug 	<ul style="list-style-type: none"> Ignoring your partner when they have annoyed you
Problem oriented	Little et al. (2016) problem focused; see also Lazarus & Folkman (1984) coping literature	Strategies that seek to influence others' feelings by transforming target's perception of <i>situation that caused an emotion</i>	<ul style="list-style-type: none"> Situation modification (changing the situation that caused an emotion) Situational cognitive reframing (changing how the target thinks about the situation that caused an emotion) 	<ul style="list-style-type: none"> Offering a refund to an angry customer Reframing a deficit in a sports match as an achievable challenge 	<ul style="list-style-type: none"> Assigning extra work to an underperforming team member Telling a friend that their recent success was undeserved
Emotion oriented	Little et al. (2016) problem focused; see also Lazarus & Folkman (1984) coping literature	Strategies that seek to influence others' feelings by focusing on, or away from, <i>the emotion itself</i>	<ul style="list-style-type: none"> Attentional deployment (refocusing the target's attention either toward or away from the emotion or situation that caused an emotion) Response modulation (encouraging the target to suppress or express particular emotions) 	<ul style="list-style-type: none"> Joking with a coworker to distract them from their workload Telling your parent to "calm down" Explaining to your child that their emotions are normal Emotional cognitive change (changing how the target thinks about their emotion) 	<ul style="list-style-type: none"> Reminding your child of an upcoming homework deadline Telling members of a sports team they need to "get angry" Telling a friend that they are overreacting

Affective Consequences of Interpersonal Emotion Regulation

It may be unsurprising to hear that when we try to regulate another person's feelings, that person's feelings often change! And this is exactly what was found in an early field study, where participants completed diaries each day reflecting on the attempts they had made to manage others' feelings and those made by others to change their own feelings (Niven et al., 2007). Since then, other studies have confirmed this core insight, including Little and colleagues' (2013) research where they coded the behavior of call center workers and feelings of their customers using audio recordings of calls.

But it appears that all strategies are not equal when it comes to changing others' feelings. In Little and colleagues' (2013) call center study, they found that when call center workers addressed the caller's problem, or how they thought about the problem (both problem-oriented strategies), their customers' negative feelings reduced over the duration of the call. Conversely, trying to distract the callers or focusing on changing their expression of emotion, such as by telling them to "calm down" (both emotion-oriented strategies), not only failed to have the desired effects but backfired, causing heightened negative emotions in customers.

Studies contrasting relationship-oriented strategies with those that are problem oriented have further identified differences in the effectiveness of these strategy types. For example, Nils and Rimé (2012) had student participants watch a distressing film clip and then hold a conversation with an intimate person (a friend, partner, or sibling) who was given instructions about which approach they should use to manage the participant's feelings. They found that the problem-oriented approach of helping someone to see the problem in a different light and the relationship-oriented approach of attending in an empathic manner both had an immediate positive impact on alleviating participants' distress—however, when they reexposed their participants to the distressing film a couple of days later, only those whose intimate person had used the problem-oriented approach showed evidence of emotional recovery.

The evidence then seems to suggest that problem-oriented strategies are the most effective at changing how others feel. Relationship-oriented strategies can have temporary benefits, while emotion-oriented strategies, contrary to their name, do not seem effective for changing emotions. These differences likely emerge because only problem-oriented strategies tackle the underlying cause of the target's feelings. A hug or a display of compassion might feel good in the short term, but with the cause of the issue left unaddressed, they are unlikely to foster longer-term change. Meanwhile, having someone try to distract you from a problematic situation or tell you how you ought to respond probably doesn't feel so good.

Performance Consequences of Interpersonal Emotion Regulation

When people try to manage others' feelings, they often do so in pursuit of an underlying goal (Niven, 2016). In sporting contexts, for example, the underlying goal is often connected to performance (Friesen et al., 2013; Tamminen & Crocker, 2013). The manager of a soccer team might give a rousing speech at halftime to raise the team's spirits so that they deliver a more convincing performance in the second half. Or opposition players might hurl insults at one another, seeking to make their adversaries feel anxious and induce an error.

The link between interpersonal emotion regulation and performance has been convincingly demonstrated in work contexts, too. Several field studies examining managers of work teams have shown that attempts to improve the feelings of team members can be rewarded through enhanced performance, whether in the form of better outcomes for

core job tasks (Vasquez et al., 2020) or team members coming up with more creative ideas and implementing them more effectively (Madrid et al., 2019).

Much like the research on affective consequences, the weight of evidence in this domain suggests that problem-oriented strategies are those that confer the greatest benefits. For example, in a leadership context, employees engaged in more discretionary helping behaviors, like giving up time to help others with their duties, when their supervisors tried to reduce their negative feelings, but only when the supervisors used problem-oriented approaches (Little et al., 2016). It therefore seems that addressing the underlying problem causing someone's feelings, whether by tackling the problem itself or how it is thought about, not only aids others' emotional recovery but paves the way for facilitating better performance.

Social Consequences of Interpersonal Emotion Regulation

An influential perspective on emotion holds that the reason why people feel and express emotion is to regulate our social relationships (Parkinson, 1996). Following this perspective, it has been argued that one of the key drivers of interpersonal emotion regulation is to achieve social goals, such as enhancing the closeness of relationships or building new bonds (Zaki, 2020).

A series of studies has shown that attempts to improve others' feelings can indeed shape people's relationships. For example, one study involved workers and inmates from a high-security prison (Niven et al., 2012). Participants were asked whether they had tried to improve the feelings of their fellow-prison-wing members and to rate the trust and friendship they felt toward every other person on their wing. A month later the exercise was repeated to study change over time. The data showed that using interpersonal emotion regulation predicted an increase in trust and friendship, in a context where strong relationships can be extremely difficult to form. In a field study of freshmen, Williams et al. (2018) likewise found that individuals who had a greater tendency to use interpersonal emotion regulation developed more supportive relationships during their first year of college.

Studies contrasting the effectiveness of distinctive strategies for social outcomes have mainly compared problem-oriented and relationship-oriented strategies. In Nils and Rimé's (2012) study where participants watched a distressing film, those whose friend, partner, or sibling used responsive listening (relationship oriented) reported greater closeness with that person and reduced loneliness, whereas cognitive reframing of the film (problem oriented) did not have the same relational benefits.

In a similar vein, I led a study exploring how the interpersonal emotion regulation content of people's social media output would affect their online relationships (Niven et al., 2015). We subjected the tweets of thousands of consenting Twitter users to linguistic analysis, and quantified the presence of relationship-oriented (e.g., empathy, care) versus problem-oriented (e.g., reappraise, reframe) content within @mention tweets (which are interpersonal in nature) that also featured affective words (e.g., *emotion*, *mood*, *happy*, *sad*). The number of tweets containing a reference to relationship-oriented interpersonal emotion regulation was positively related to how many followers a person had (an indicator of their online popularity), while the number referring to problem-oriented regulation was negatively related to follower count.

So why is it that problem-oriented strategies work so well for emotional change and performance but not for building or enhancing relationships, whereas the converse is true for relationship-oriented strategies? It seems likely that different strategies meet different needs (Swerdlow & Johnson, 2022). Research on recipients of social support discuss different needs this can fulfill, including the needs for control, truth, and validation (Reis,

2012; Zee et al., 2020). For interpersonal emotion regulation, problem-oriented strategies may help a person to have a better handle, or better understanding, of their situation, and therefore could fulfil control and truth needs, which may facilitate greater emotional recovery and equip the person with the resources or confidence to achieve greater performance. In contrast, relationship-oriented strategies should help a person to feel understood and validated, which might make them feel closer to the regulator.

Taking Stock and Looking Forward

Given that problem-oriented strategies are beneficial for affective and performance outcomes, whereas relationship-oriented strategies are uniquely helpful for social outcomes, a remaining question is whether people can successfully combine strategies to reap the diverse rewards. A couple of studies speak to this question. Both Feng (2009) and Pauw and colleagues (2018) found that combining strategies was more effective than using either problem-oriented or relationship-oriented strategies alone. Crucially, in both studies, using relationship-oriented strategies first gleaned maximum rewards. They suggested that, in the absence of prior relational behaviors, the acts of trying to address a problem or how someone thinks about that problem might appear to be critical or dismissive of the target's feelings or their way of seeing the situation.

However, an alternative possibility is that the type of strategy people respond most positively to may depend on personal preferences or the situation. While some people might feel invalidated by attempts to reframe or "fix" their situation, others may feel patronized by someone expressing empathy and understanding toward them. In this latter case, the *visibility* of the support being offered could unintentionally convey that the regulator perceives the target to be incapable of dealing with their negative feelings (Bolger & Amarel, 2007). If this is true, then the important question becomes how to figure out what type of interpersonal emotion regulation behaviors to use.

A neat set of studies from Horowitz and colleagues (2001) provides insight here, suggesting that the problems that we talk about and how we frame these provide important cues about how we want others to provide support to us. When we focus on agentic problems (i.e., related to achievement) or frame them in terms of agency (e.g., "I don't know what to do"), we respond more positively when others help to solve our problem and give advice than when they show empathy and understanding. The exact opposite is true when we focus on communal problems (i.e., related to relationships) or frame them in communal terms (e.g., "I just feel awful"). The implication is that we need to take care to read the cues people give out when they talk about how they are feeling or the problems they are experiencing so that we can tailor our interpersonal emotion regulation to their needs for truth and control or for validation.

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CHAPTER 19

Implications of Attachment Processes for Emotion Regulation

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According to attachment theory, individual differences in the responsiveness of close relationship partners, beginning with parents, and the resulting formation of fairly stable relational patterns (*attachment orientations* or *styles*) have major implications for the ways in which people regulate emotions and cope with stressful events. In this chapter, we review what has been learned about the implications of attachment orientations for emotion regulation processes. We begin with a brief account of hypothesized links between different forms of attachment insecurity (anxiety, avoidance) and strategies people use to regulate distress. We then review findings from behavioral and neuroscientific studies showing that people differing in attachment orientations tend to show different cognitive, behavioral, and neural patterns of emotion activation and regulation.

Attachment Orientations and Emotion Regulation: Theoretical Background

The implications of attachment for emotion regulation received attention in Bowlby's (1973, 1980, 1982) foundational writings, where he attempted to understand the anxiety-buffering function of close relationships and the capacity for dysfunctional relationships to generate negative emotions and, in the extreme, to precipitate debilitating forms of psychopathology. The issue of emotion regulation has received much additional attention in our and other researchers' theoretical and empirical efforts to explain how secure attachments help a person maintain emotional composure and how different forms of insecurity interfere with effective emotion regulation (Mikulincer & Shaver, 2016, 2023).

According to Bowlby (1982), human beings are born with an innate psychobiological system (the *attachment behavioral system*) that motivates them to seek proximity

to protective others (*attachment figures*) in times of need. Interactions with attachment figures who are responsive and supportive install a sense of security (confidence that one is competent and lovable and that others will be supportive when needed) and foster the formation of positive mental representations of self-worth and others' benevolence (Bowlby, 1973). When attachment figures are not supportive, however, a sense of security is not attained, worries about one's value and others' intentions are strengthened, and insecure patterns of relational expectations, emotions, and behaviors (*insecure attachment orientations*) are formed (Bowlby, 1973).

These attachment orientations are conceptualized as regions in a continuous two-dimensional space (e.g., Brennan et al., 1998). One dimension, attachment-related *avoidance*, reflects the extent to which a person distrusts others' goodwill and defensively strives to maintain behavioral and emotional independence. The other dimension, attachment-related *anxiety*, reflects the extent to which a person worries that others will not be available in times of need and anxiously seeks their love and care. People who score relatively low on both dimensions are said to have a core sense of *felt security*.

From an attachment perspective, felt security is a resilience resource in times of need and a building block of mental health and social adjustment (Bowlby, 1973). Mikulincer and Shaver (2016) reviewed extensive evidence showing that people who are more secure with respect to attachment are more optimistic about life and make fewer catastrophic appraisals of threats and dangers. They are also more confident in their ability to deal with threats and challenges and tend to employ more constructive and effective emotion regulation strategies (e.g., problem solving, reappraisal, support seeking). Moreover, having managed threatening events or reappraised them in benign terms, secure people can remain open to their emotions, express and communicate feelings freely and accurately to others, and experience them fully without distortion.

In contrast, disruptions in the sense of attachment security and the subsequent formation of attachment insecurities (anxiety, avoidance) are viewed as risk factors for emotional problems and psychopathology (Mikulincer & Shaver, 2016)—however, it is important to note that these insecure attachment orientations are initially adaptive, in the sense that they adjust a child's behavior to the requirements of an inconsistently available or consistently unavailable attachment figure (Cassidy & Kobak, 1988). They become maladaptive when applied to later relationships in which warm and affectionate interactions with a partner are possible and can help a person maintain emotional composure during stressful periods and sustain both partners' subjective well-being (Overall et al., 2022). Moreover, these insecure attachment strategies encourage continued reliance on distorted mental representations of self and others, which contribute to poor physical and mental health (Mikulincer & Shaver, 2016).

The early attachment experiences of insecure people often involve unstable and inadequate distress regulation (Bowlby, 1973), which interferes with the development of inner resources needed for coping successfully with stressors. This impairment is particularly likely during prolonged, highly demanding stressful experiences that require reliance on others' support and guidance and actual confrontation with a problem. In such cases, attachment insecurities can damage not only a person's own physical and mental health but also the health and well-being of key relationship partners (Overall et al., 2022).

When regulating emotions, avoidant people attempt to block or inhibit any feeling that can reactivate suppressed needs for love and attention and proximity- and support-seeking tendencies (Mikulincer & Shaver, 2016). These inhibitory efforts are directed mainly at fear, anxiety, anger, sadness, shame, guilt, and distress because these emotional

states are associated with threats and feelings of vulnerability and neediness. In addition, anger often implies emotional involvement or investment in a relationship, and such involvement is incongruent with avoidant people's preference for independence and self-reliance. Avoidant individuals also attempt to block or inhibit emotional reactions to potential or actual signs of others' disapproval, rejection, or betrayal, because such threats can reactivate unwanted needs for love and care.

Attachment-related avoidance can cause people to avoid noticing their own emotional reactions. Avoidant individuals often deny or suppress emotion-related thoughts and memories, divert attention from emotion-related material, or suppress or mask verbal and nonverbal expressions of emotion (Mikulincer & Shaver, 2016). By defending against the conscious experience and expression of unpleasant emotions, avoidant individuals make it less likely that emotional experiences are integrated into existing cognitive-affective structures, and less likely that such feelings and mental structures are used effectively in subsequent information processing and social behavior. Bowlby (1980, p. 345) described this strategy as "defensive exclusion," resulting in the creation of "segregated mental systems."

Unlike people scoring high on attachment-related avoidance, who tend to view negative emotions as goal-incongruent states that should be ignored or suppressed, people scoring high on attachment anxiety often tend to perceive negative emotions as congruent with their proximity-seeking goals and hyperactivation of the need for love, attention, and care. These individuals are guided by an unfulfilled wish to cause attachment figures to pay more attention and provide more reliable protection and support (Cassidy & Kobak, 1988). Therefore, they tend to exaggerate the seriousness of threats and overemphasize their sense of helplessness and vulnerability, partly because signs of weakness and neediness sometimes elicit attachment figures' attention and care (Overall et al., 2022). Moreover, they may focus on and even exaggerate negative emotions and attempt to up-regulate rather than down-regulate distress. At the same time, they fear being rebuffed or rejected, which can motivate attempts to down-regulate or suppress emotion. They are, as Ainsworth et al. (1978) said early on, anxious and *ambivalent*.

Mikulincer and Shaver (2016) proposed various paths along which attachment-anxious people tend to up-regulate distress. One method is to exaggerate the appraisal of threats, perceptually heightening the threatening aspects of even fairly benign events, hold pessimistic beliefs about one's ability to cope with threats and challenges, and attribute failures and setbacks to one's personal inadequacies. Another method is to attend to internal indicators of distress. This includes hypervigilant attention to the physiological aspects of negative emotions, heightened recall of threat-related experiences, and rumination on real and potential threats. Still another strategy is to intensify negative emotions by favoring an approach, counterphobic orientation toward threatening situations or making self-defeating decisions, and taking ineffective actions likely to end in failure. These strategies create a self-amplifying cycle of distress even after a threat objectively recedes.

Empirical Evidence Linking Attachment Insecurities to Emotion Regulation

Attachment-related differences in emotion regulation have been extensively documented in studies of reactions to stressful and traumatic events. In these studies, avoidant people

are more likely to emotionally or cognitively disengage from distress-inducing events by dismissing or forgetting them or suppressing emotions and thoughts related to the events (e.g., Marshall et al., 2022). Moreover, they tend to rapidly withdraw behaviorally from potentially threatening situations. In two studies assessing reactions to a room gradually filling with smoke or to the sound of a fire alarm in a nearby room during a group task, more avoidant people were quicker to disengage from the group task and were faster in fleeing the room (Ein-Dor et al., 2011, 2018). In contrast, attachment anxiety has been associated with engaging in distress-exacerbating rumination: moody pondering, or thinking anxiously or gloomily about threatening events (e.g., Durme et al., 2018). This kind of distress amplification can also be seen in attachment-anxious adults' proneness to cry in response to stressful or sad events (e.g., Drenger et al., 2017) and their tendency to magnify the threat intensity of a painful physical stimulus and to feel helpless in the presence of pain (pain catastrophizing; e.g., Andersen et al., 2019).

Further evidence concerning the link between attachment and emotion regulation comes from longitudinal studies examining whether being securely versus insecurely attached during infancy (assessed with Ainsworth et al.'s, 1978, Strange Situation) is prospectively related to emotion regulation strategies during childhood, adolescence, and young adulthood (see Cooke et al., 2019, for a review and meta-analyses). For example, data from the London Parent-Child Project indicate that infants who were insecurely attached to their mother were less likely than their secure counterparts to acknowledge distress and rely on adaptive coping strategies at age 11 (Steele & Steele, 2005). In a recent study based on data from the Minnesota Longitudinal Study of Risk and Adaptation, Girme et al. (2021) found that infants who were classified as insecure in the Strange Situation at 12 and 18 months of age were less able to acknowledge and calmly express their feelings during conflict discussions with a romantic partner during young adulthood (20–35 years of age). Based on these kinds of findings, Cooke et al. concluded that attachment insecurities during childhood promote difficulties in emotion regulation throughout life.

Neuroscientific studies have provided evidence for signs of distress intensification in the brains of anxious people facing experimentally induced threats. For example, DeWall et al. (2012) found that in response to a simulated experience of social exclusion while participants were in a magnetic resonance imaging (MRI) scanner, self-reports of anxious attachment were related to heightened activity in regions involved in distress activation: the dorsal anterior cingulate cortex (dACC) and anterior insula. Importantly, these brain reactions to social exclusion were attenuated by asking attachment-anxious people to reflect on their security-providing attachment figure (i.e., by what we have called "security priming"; Karremans et al., 2011)—that is, their hyperactivation could be socially down-regulated.

Avoidant people's defensive tendency to block the experience of negative emotions has been noted in studies assessing thought suppression. For example, Fraley and Shaver (1997) asked participants to write about whatever thoughts and feelings they were experiencing while being asked to suppress thoughts about a romantic partner leaving them for someone else. Avoidant attachment was associated with a greater ability to suppress separation-related thoughts, as indicated by less frequent thoughts of loss following the suppression task and by lower skin conductance during the task. In contrast, attachment anxiety was associated with a poorer ability to suppress separation-related thoughts, as indicated by more frequent thoughts of loss following the suppression task and higher skin conductance during the task. Importantly, these attachment-related variations are

also evident in patterns of brain activation and deactivation when people are thinking about breakups and losses and attempting to suppress such thoughts (Gillath et al., 2005)—however, other studies have found that when a high cognitive load is imposed, avoidant people’s ability to suppress negative thoughts is disrupted and they become overwhelmed by the suppressed material (e.g., Kohn et al., 2012).

The fragility of avoidant defenses was also noted in Chun et al.’s (2015) study, in which avoidant participants’ ability to disengage attention from contempt faces was impaired when they were asked to rehearse a seven-digit number (imposing a cognitive load) while performing the attention task. The same fragility was noted by Pietromonaco et al. (2015) in their review of attachment studies on physiological reactions to stressors. Specifically, avoidant attachment has been associated with decreased heart rate variability, impaired blood pressure recovery, increased skin conductance, and heightened diastolic blood pressure in response to various laboratory stressors, such as recalling a stressful situation, performing demanding tasks, or discussing relationship problems with a dating partner. Similarly, studies showing that avoidant people do sometimes display strong negative emotions in response to painful separation or loss of a loved one suggest a similar breakdown of defenses when these people experience a great and prolonged emotional load (e.g., Bourassa et al., 2019).

Following this line of research, Vrtička et al. (2012) scanned the brains of people who were asked to attend naturally or to cognitively reappraise their emotional responses to unpleasant scenes. Avoidant participants showed increased prefrontal and anterior cingulate activation to unpleasant scenes and exhibited increases in dorsolateral prefrontal cortex and left amygdala activity during reappraisal—that is, avoidant people may be less efficient in using reappraisal strategies and need to engage in more effortful control for dealing with distress. Anxious participants showed increases in the right amygdala across all conditions—another sign of their tendency to up-regulate rather than down-regulate distress.

People scoring high on attachment anxiety or avoidance have serious difficulties in identifying and describing emotions (e.g., Radetzki et al., 2021). These problems are also evident in studies examining individual differences in mindfulness: the capacity to maintain mindful attention and awareness to “here-and-now” stimuli, sensations, feelings, and thoughts without any judgmental attitude. In all such studies, self-reports of attachment insecurities are associated with lower levels of dispositional mindfulness, and difficulties in emotion regulation seem to mediate this association (e.g., Stevenson et al., 2021; see Stevenson et al., 2017, for a meta-analysis).

Conclusions

Attachment-related individual differences in emotion regulation have been documented in a wide variety of behavioral and neuroscientific studies, providing strong support for Bowlby’s (1982) attachment theory and its extension to the realm of adult dispositions and relationships—however, more research is needed to better articulate and understand individual differences in emotion-related goals and regulation strategies. In addition, future studies should be aimed at integrating Bowlby’s (1988) notion that effective therapeutic interventions amount to providing a secure base and help with emotion regulation—which was likely missing in a client’s previous attachment relationships—with the findings we have reviewed here concerning attachment insecurities and emotion regulation strategies.

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CHAPTER 20

Emotion Regulation in Romantic Relationships

TABEA MEIER
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Romantic relationships are hotbeds of emotions—from the high highs and low lows in the beginning of a new relationship to all the tough and tender moments when navigating life as a couple to the question of how to let go and move on when a relationship ends. How couples regulate emotions has profound consequences, not only for relationship quality and stability but also for well-being, health, and longevity (e.g., Gottman & Gottman, 2017; Levenson et al., 2014; Wells et al., 2022).

Drawing from functionalist perspectives of emotion (e.g., Levenson, 1999), we propose that each phase in a romantic relationship (i.e., initiation, development, ending) can be characterized by specific challenges and opportunities that give rise to specific emotions and with it, demands for emotion regulation. We do not wish to imply that these challenges and opportunities are universal (although there is evidence that romantic love is a cross-cultural phenomenon; see Jankowiak & Fischer, 1992) or that everyone will navigate these stages in similar ways (in fact, variability is key when it comes to couples' emotion regulation; Levenson et al., 2014). But we hope for this to be a useful organizing framework that can bridge the vast affective and relationship science literatures that speak to couples' emotion regulation.

Emotion Regulation During Relationship Initiation

Romantic relationships can begin in line at the grocery store, in a bar and, increasingly so, online. They may be most likely to progress beyond fleeting attraction if both parties are interested in pursuing a relationship; are more, rather than less, proximal (e.g., living in the same area); and embody what individuals are looking for in a partner (Clark et al.,

2019). Many studies have examined (often hypothetical) romantic and sexual attraction. Yet, how individuals fall in love and begin a relationship (which may not necessarily go hand in hand) remains surprisingly elusive. What we do know is that romantic love is a powerful emotional experience that has long occupied laypeople, artists, and scholars alike.

High Highs and Low Lows

The early stages of romantic love have experiential, behavioral, physiological, and neurobiological qualities that can be almost cocaine-like (Fisher et al., 2006). Newly in love individuals may feel excitement, elation, and euphoria. They may be highly focused on their partner and motivated to be around them. They may feel full of energy, lose their appetite, and have trouble sleeping. At the neural level, intense, early-stage romantic love can be associated with activity in brain regions that are also implicated in addiction (Aron et al., 2013). In addition to the high highs, however, individuals may also experience low lows, perhaps because of the enormous uncertainty of this phase. In fact, in a study of young adults, being in love was also associated with depressive and anxiety symptoms (Bajoghli et al., 2014). Fear and anxiety may arise over whether one's feelings are reciprocated and whether a relationship will flourish. Embarrassment, guilt, and shame over real or imaginary shortcomings may come up. Jealousy may rear its head when there are attractive others around.

While individuals are often more motivated to down-regulate negative and up-regulate positive emotions, the similarities between early romantic love and states of addiction or mania point to an interesting emotion regulation challenge: Individuals (as well as their family members, friends, coworkers, etc.) may want to down-regulate some of the positive emotions when they become too much. And while romantic love and sexual desire often overlap, there is evidence that they are distinct from each other (e.g., Diamond, 2009); coupling or decoupling them may pose its own regulatory challenge.

Rules of Expression

When people begin a new relationship, they may face another profound emotion regulation challenge. On the one hand, they may want to present the best version of their self in order to impress their (potential) partner, while on the other hand, they may want to present their "authentic self" and engage in vulnerable self-disclosure to promote closeness and intimacy (e.g., Reis & Shaver, 1988). At the emotional level, presenting the best self can take the form of up-regulating prosocial behavior toward others in general (e.g., holding the door open for a stranger) and the new (or potential) partner in particular (e.g., offering support). Individuals may also follow (culture-specific) display rules that govern the appropriateness of a given emotional behavior and are typically more stringent (and perhaps scripted) for budding relationships. Early in a relationship, individuals may seek to amplify the expression of positive emotions and suppress the expression of negative emotions. With time, partners have greater opportunities to reveal themselves across a wider range of situations, making selective self-presentation more difficult or less relevant.

At the same time, individuals may not just want to show their best self but also reveal their "authentic self" early on in a relationship. Building trust and intimacy is a primary goal of relationship initiation according to Reis and Shaver (1988), who described relationship initiation as a dynamic, interactive process of self-disclosure and responsive behaviors that can create *intimacy* between partners. In fact, the most frequently

endorsed behaviors for individuals seeking a relationship are activities that boost emotional intimacy (e.g., Reis & Shaver, 1988).

Current Directions

Love and desire can be quite fluid (Diamond, 2009). Falling in love is often described as a state beyond one's control, but individuals may (seek to) regulate love-related feelings more than one might assume. They may seek to up-regulate positive emotions to feel more attached to a partner (if they are invested in making the relationship work) or down-regulate them to feel less attached (perhaps in order to focus on other goals, protect existing relationships, or because early attachment experiences make them wary of too much interdependence). More inclusive research on emotion regulation in this phase is needed, including sources (e.g., attachment), strategies (e.g., emotional acceptance), and consequences (e.g., for subsequent relationship development), to better understand how different individuals (across cultures, gender identities, sexual orientations, and other identities) navigate emerging romantic relationships. And we must also recognize and disavow some of the earlier research in this area, which engaged in reprehensible practices (e.g., sexual orientation and gender identity change efforts) that caused violent harm to individuals who identify as lesbian, gay, bisexual, transgender, queer, or members of other marginalized sexual orientations or gender identities (LGBTQ+). Moreover, while romantic love may be (nearly) universal (Jankowiak & Fischer, 1992), the idea that love is a prerequisite for a committed relationship is not shared across cultures. What emotion regulation looks like across diverse types of romantic relationships (e.g., arranged marriage, non-monogamy) is ripe for more research.

Emotion Regulation During Relationship Development

Most people will be in a committed relationship at some point in their lives. In the United States, for example, more than 93% of all people will have been married at least once by the age of 65. Other forms of committed relationships are common around the world and for some (e.g., same-sex couples) often the only option.

Navigating Conflict and Beyond

Disagreements are very common in romantic relationships and potent triggers of negative (but also positive) emotions. This renders couples' conflict discussions a fertile testing ground for emotion regulation. A large body of laboratory-based research has probed how partners generate and regulate emotions during conflict at the level of emotional experiences, behavior, and physiological arousal and reveals tremendous individual differences (e.g., Gottman & Gottman, 2017; Levenson et al., 2014). In our own work (Bloch et al., 2014), for example, we have found that how quickly spouses down-regulate negative emotions during conflict is an important correlate of marital satisfaction (for men and women) and predicts changes in marital satisfaction longitudinally over more than a decade (for women). There is, of course, much more to a relationship than navigating conflict as partners regulate emotions in positive contexts (e.g., Algoe, 2019; Gable & Bedrov, 2022) and everyday life (e.g., Horn et al., 2019; Meier et al., 2021), with the latter often examined through experience sampling methods. Overall, this body of work points to couples' emotion regulation as a key predictor of not just relationship quality

and stability but also the well-being and health of both partners, which has origins in early attachment experiences (Mikulincer & Shaver, 2007) and changes across the life-span, often for the better (e.g., Levenson et al., 2014).

Dyadic Emotion Regulation

As partners become increasingly included in each other's selves (Aron et al., 2013), couples' emotion regulation becomes more than the sum of each partner's parts. A growing literature has looked at couples' emotion regulation through a dedicated dyadic lens, examining how individuals regulate their own and their partner's emotions for better or worse in a relationship (e.g., Gable & Bedrov, 2022). Interest in couples' coregulation (or linkage, synchronization, or resonance, which all refer to phenomena of emotional coordination; see also Butler, this volume) especially has been on the rise. Fredrickson (2016), for example, presents an account of love as emotional coordination that occurs during moments of *shared* positive emotions (see, e.g., Wells et al., 2022, for an overview). This positivity resonance between spouses (especially at the behavioral level) predicts physical health and longevity over more than 30 years over and above individual positive emotions (Wells et al., 2022). In addition, couples not only coregulate their own emotions, their emotions also affect (dare we say, regulate) close others outside the dyad. For example, when a baby arrives, many couples struggle emotionally and this, in turn, can have consequences not just for the relationship but also the child's emotional development (Gottman & Gottman, 2017).

Current Directions

Existing couples research has provided important insights. At the same time, the field needs more inclusive research that puts couples' emotion regulation in context to interrogate the roles of culture, racism, sex, gender, socioeconomic status, and relationship norms, among others. Moreover, we note that in a recent analysis of self-report measures from 47 longitudinal couples studies (Joel et al., 2020), several emotion-related constructs (e.g., appreciation toward their partner) emerged as important correlates of relationship quality. Yet, none of these constructs predicted *changes* in relationship quality over time. From this, some might conclude that couples' emotions matter little for relationship development—however, studies that have included dedicated measures of couples' emotional functioning, especially measures of couples' objectively coded emotional behaviors, provide a different perspective—both positive and negative emotional behaviors independently predict marital satisfaction and stability (e.g., Karney & Bradbury, 1995)—converging with emotion-focused couples therapy approaches, which have proven successful (e.g., Gottman & Gottman, 2017). We suspect that future couples research will benefit enormously from more cross-talk with couples therapists (and, hopefully, the reverse will also apply).

Emotion Regulation During Relationship Dissolution

All good—and bad—relationships come to an end. Whether through amicable “conscious uncoupling,” a messy divorce, or the death of a partner, relationship dissolution is considered one of the most stressful life events (e.g., Knöpfli et al., 2016). Relationship dissolution is a longer-term process and profound changes in individuals' emotions and thoughts may surface months before the official end of a relationship (Seraj et al., 2021).

Letting Go

The end of a relationship often elicits intense emotions. Individuals may experience anger when infidelity was involved, craving for the former partner, or relief when the relationship was a burden. Yet, sadness and depression-like states are perhaps most common after relationship dissolution (Sbarra & Ferrer, 2006), consistent with the notion that irrevocable loss is a prototypical sadness antecedent (Levenson, 1999). Some of the strategies that individuals use to regulate emotions after a breakup may be more maladaptive—for example, continued contact with an ex-partner (O’Hara et al., 2020). Other strategies appear to be more helpful—for example, sharing emotions with other people, which may help build connection and support (Reis & Shaver, 1988; see also Rimé, this volume), or expressive writing, which may help construct a coherent narrative and meaning out of what has happened (Pennebaker, 1997). Functionalist perspectives remind us that sadness in response to loss is adaptive as it helps individuals disengage and elicit social support, suggesting an important role for emotional acceptance as a regulation strategy (Ford et al., 2018). And while many people seem to adapt well to relationship dissolution over time (Knöpfli et al., 2016), there is considerable heterogeneity in trajectories and some have questioned how common resilience after spousal divorce or loss really is (Infurna & Luthar, 2016).

Moving On

When a relationship ends, individuals need to let go *and* move on. They may (re)discover who they are and who they want to be, what gives them pleasure and meaning in life, and whether to stay single or look for a new relationship. In this process, positive emotions are candidate emotions to up-regulate as they may help individuals broaden and build action repertoires (Fredrickson, 2001) and reengage with new goals (Haase et al., 2021). One emotional system that could be particularly useful is play or playfulness (Panksepp, 1998), which is an inclination to engage in intrinsically motivating behaviors for fun (Van Vleet & Feeney, 2015). Playfulness has an important role in relationships (e.g., inside jokes), but it could also be critical in navigating relationship dissolution as it promotes self-expansion (Aron et al., 2013) and may help individuals explore and engage in new behaviors, goals, and relationships. After all, the former partner may have been a main source of support in good and in bad times (Gable & Bedrov, 2022) and playfulness may help individuals (re)connect with other people.

Current Directions

Relationship endings seem especially well suited for studying mixed emotions as individuals go through intense negative emotions (which sometimes may not or cannot be down-regulated) while also wanting to up-regulate positive emotions. For many, this process may not be linear, and moments of joy or playfulness may be interwoven or co-occur with moments of sadness (Bonanno, 2009). Moreover, although grief can be very isolating, the end of a romantic relationship is a deeply interpersonal experience that may affect other people, including children (whose lives may be profoundly altered by parental separation or loss), friends (who may feel the need to choose sides), other family members or coworkers (who may be more or less supportive), and communities. Research on emotion regulation has rarely adopted a systemic perspective that accounts for regulation not just within individuals (or within a couple). The dissolution of a relationship could provide a meaningful context for developing frameworks that carefully consider sources and consequences of emotion regulation across multiple relationships.

Conclusion

Almost all of our emotion regulation episodes occur in social contexts (Gross et al., 2006)—yet, emotion regulation research has often relied on single-subject paradigms. Romantic relationships are hotbeds of emotion and their beginnings, development, and endings offer ample opportunities and challenges for emotion regulation that we hope more emotion researchers will explore.

ACKNOWLEDGMENTS

This work was supported by a grant from the Swiss National Science Foundation awarded to Tabea Meier (P2ZHP1_199409) and a research venture grant from the Northwestern University School of Education and Social Policy awarded to Claudia M. Haase.

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CHAPTER 21

Emotion Regulation in Parenting

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Human beings have been parents since the dawn of humanity. Parenting determines both the survival of the human species and the way successive generations develop. Successful parenting requires a wide range of resources and skills, and in this chapter, we consider mounting evidence that emotion regulation (ER) plays a critical role in parenting. After defining ER in parenting and presenting its major goals, we briefly review its antecedents at the personal and cultural levels. In so doing, we seek to understand why pressure to exercise ER has increased in parenting in recent decades. Then, we review the outcomes of parents' ER and discover an important point: In parenting, the perfect is the enemy of the good. Finally, we present a number of important directions for future research.

The Nature of ER in Parenting

ER in parenting is defined as the automatic or strategic process by which parents regulate their own or their child's emotion in order to maintain their well-being as a parent and/or to foster their child's development. ER in parenting can thus be represented as a 2×2 matrix: Its target can be the parent's emotion (self-focused) or the child's emotion (child focused) and its goal can serve primarily the interests of the parent (self-serving ER) and/or primarily the child's (child-serving ER). Examples are provided in Table 21.1 of ER activities that belong specifically in one cell. However, as will be evident later, a single regulatory activity can sometimes belong in several cells.

Unfortunately, as yet no research has either explicitly integrated or compared the matrix cells. However, there has been research within most cells. Examples are, in the

TABLE 21.1. Illustrations of the 2 × 2 Matrix of Emotion Regulation (ER) in Parenting

Target/ beneficiary	Self-focused ER (ER focused on the parent's emotion)	Child-focused ER (ER focused on the child's emotion)
Self-serving	A mother down-regulates her sadness when her child leaves the nest. A father up-regulates his enthusiasm at playing with his children to fit the image he has of the ideal caring father.	A father down-regulates the excitement of his children when they make too much noise at home. A mother up-regulates her son's enthusiasm for helping her wash the car.
Child-serving	A mother down-regulates her anger to avoid spanking her child. A father up-regulates his happiness when receiving a gift he only moderately likes to avoid disappointing the child.	A father down-regulates his daughter's sadness at her first breakup. A mother up-regulates her son's anxiety about exams to motivate him to do more math exercises.

top left cell, research linking ER with parenting stress (see Mikolajczak & Roskam, in press, for a review); in the bottom left cell, research linking ER with child maltreatment (see Miragoli et al., in press, for a review); and in the bottom right cell, research on parental coregulation of child emotions (see Holodyniski & Kärtner, in press, for a review). Research specifically focusing on the top right cell is missing.

ER in parenting is both frequent and highly varied: Parents aim to down-regulate negative emotions (e.g., down-regulating their anger intensity to avoid spanking their child, down-regulating their child's anger at a sibling), up-regulate negative emotions (e.g., up-regulating their facial manifestations of anger if their teenager breaks an important house rule, up-regulating their teenager's stress to encourage him or her to study), down-regulate positive emotions (e.g., hiding their amusement at their young child's mistake, reducing their child's enthusiasm for a costly toy), and up-regulate positive emotions (e.g., showing love more frequently when the child is going through a difficult period, increasing their teenager's enthusiasm for his or her lessons). Depending on the parent, the child, the circumstances, and the culture, ER can be more or less effortful.

Goals of ER in Parenting

ER is a critical ability for parents (Dix, 1991; Rutherford et al., 2015), as it serves multiple and crucial goals. The most common and important ones are listed below. In reference to Table 21.1, each goal can be reached via one or, most often, several forms of parental ER.

Socialization of Children's Emotions

By up- or down-regulating specific emotions in certain contexts, parents implicitly teach their children display rules—namely, that some emotions are more/less appropriate in certain contexts (Eisenberg et al., 1998). This goal is achieved by both self-focused and child-focused ER and primarily serves the child (see Table 21.1). For instance, parents may up-regulate external manifestations of happiness when receiving a gift that they only moderately like, in order to teach their children which emotion it is appropriate/inappropriate to show in this circumstance.

Coregulation of Children's Emotions

Up to the age of 5, children have difficulty in managing their emotions on their own because of immature prefrontal areas (Lenroot & Giedd, 2006). Parents therefore regularly coregulate their children's emotions by implementing and verbalizing the chosen ER strategy (see Holodynski & Kärtner, *in press*, for a review). This goal is typically achieved with child-focused ER and primarily serves the child (see Table 21.1). For example, a parent may direct a child's attention to something interesting in order to manage impatience in a long queue.

Fostering the Development of Children's ER

Parents strategically use ER strategies to model and foster the development of some specific ER strategies in their children (Bariola et al., 2012). This goal is typically achieved with self-focused ER and primarily serves the child (see Table 21.1). For instance, a father may up-regulate his enthusiasm about gardening—"I'm tired but the weather is beautiful and Mom will be so happy"—to foster his son's own ER.

Enforcing Rules

Parents consciously or unconsciously enforce their rules by up-regulating expression of positive emotions when the child behaves according to their expectations and up-regulating expression of negative emotions when the child fails to do so. This goal is typically achieved by self-focused ER and can be both self- and child serving (see Table 21.1). For instance, a mother may compliment her daughter when she cleans her room and express disappointment or irritation when the room is a mess.

Fostering Children's Development

Parents regulate both their own and their children's emotions to foster children's affective, cognitive, social, and physical development. This goal is achieved by both self-focused and child-focused ER and is primarily child serving (see Table 21.1). For instance, a father may down-regulate the expression of his anxiety at his daughter's first outing to foster her social development, or up-regulate his son's anxiety about math to foster his cognitive development.

Maintaining Parents' Well-Being

Parenting entails a lot of acute and chronic stress (Deater-Deckard, 2008) and parents need ER to maintain their well-being in the short and long run. This goal is achieved by both self-focused and child-focused ER that are primarily self-serving (see Table 21.1). For instance, a mother may down-regulate her stress and her son's anger toward his brother to reduce the shouting and preserve her own well-being.

Antecedents of ER in Parenting

ER in parenting is determined by both personal and cultural factors. At a personal level, the transition to parenting is accompanied by a number of neurobiological changes that

foster ER capacity and improve the care given to the newborn child. These changes occur in brain regions directly involved in emotion information processing, emotional response, and self-regulation (Kinsley & Meyer, 2010; Swain, 2011) and result in increased perceived self-control (Galdioli et al., 2020) and greater capacity to respond to the infant's need for coregulation (see Rutherford et al., 2015, for a review). Although potent, these neurobiological changes do not mask individual differences in parents' ER resulting from their genetic makeup (Canli et al., 2009) and from psychological traits that either facilitate or hamper ER. For instance, extraversion, agreeableness, conscientiousness, and openness facilitate ER self-efficacy in parenting, while high levels of neuroticism impede it (e.g., Cabecinha-Alati et al., 2020). Besides genes and traits, life experiences also influence ER: Parents who were maltreated in their own childhood show poorer ER capacity and self-efficacy (see Talmon, in press).

At the cultural level, a number of changes that occurred during the 20th century increased the pressure to exercise ER in parenting. These changes resulted from a profound change in thinking about children. Children's needs had been largely ignored for centuries, but in the 20th century children increasingly came to be regarded as precious beings whose protection must be ensured, and whose development must be optimized (Dupont et al., 2022). The Convention on the Rights of the Child (United Nations General Assembly, 1989) can be considered a milestone in this shift. Besides children's rights, the Convention outlines the duties of those responsible for them: their parents, obviously, and the signatory states that must guide and support parents but also monitor them and intervene when they are not acting in the child's best interest.

It is in the context of the Convention that the concept of *positive parenting* has been defined (Daly, 2007). Positive parenting sets the standards for child-rearing behaviors that are in the child's best interest. Its definition is based on two axes (Baumrind, 1989; Maccoby & Martin, 1983): the first concerns the importance of warm, supportive, empowering, and responsive parenting, whereas the second concerns the importance of structure, rules, and limits given to the child. While research shows that both axes are necessary to the child's development (Baumrind, 2012; Baumrind et al., 2010), countries and cultures vary in the emphasis they put on the first and/or second axis. For reasons that are beyond the scope of this chapter (see Dupont et al., 2022, for a summary), Western countries have increasingly emphasized the first axis, culminating in the concept of "exclusively positive parenting" that focuses exclusively on the first axis and considers the second as severe discipline, harsh parenting, or emotional abuse (Larzelere et al., 2017).

The concrete consequences of such a shift for ER in parenting are that many parents make constant efforts to up-regulate positive emotions (love, enthusiasm, pride, etc.) in the presence of their children and to down-regulate negative emotions (stress, impatience, anger, etc.) (Lin et al., 2021). Many parents believe that even if a child breaks an important house rule or behaves against values to which the parent is strongly attached, the parent must down-regulate his or her own negative emotions while accepting the child's. Expressions of love, warmth, and support have become the default response, regardless of the child's behavior on the one hand and the parent's feelings on the other.

Outcomes of ER in Parenting

All things being equal, the available evidence indicates that the development of a child whose parents have good ER strategies may be more favorable than that of a child whose parents have poor ER strategies. One may therefore assume that the more parents

regulate their emotions, the better—however, things are a little more complex than that in the parenting domain.

Generally, it seems that efficient parental ER has positive outcomes for both the child and the parent. Note that research is scarce, that it focuses on ER in general, not necessarily ER in response to emotions that arise in the specific context of parenting, and that most measures are self-reported. Nonetheless, better parental ER self-efficacy has been related to higher parental well-being (e.g., less parental burnout; Vertsberger et al., 2022) and better child emotional/affective development (Are & Shaffer, 2016; Oddo et al., 2022; Zimmer-Gembeck et al., 2022). Studies on the relation between parental ER and social development are inconclusive so far (see Zimmer-Gembeck et al., 2022, for a meta-analysis), and studies on cognitive and physical development are still lacking (see, although, De Campora et al., 2016, for preliminary evidence that mothers' ER self-efficacy may influence children's body mass index). Although proper mediating studies are also lacking, likely mediators between parental ER and better child development include the fact that parents with better ER self-efficacy are less preoccupied with their own emotions and more sensitive to their children's emotions and needs (Leerkes et al., 2020), foster more secure attachment (see Brake et al., 2020, for indirect evidence), have better emotion socialization practices (i.e., display better reactions to their children's emotions; Cabecinha-Alati et al., 2020), tend to adopt a more authoritative parenting style (i.e., combining warmth and discipline; Bahrami et al., 2018), display less harsh or hostile parenting (Oddo et al., 2022; Sarıtaş et al., 2013), and are more supportive when their children face adversity (Oddo et al., 2022). All of these have been related to better child development, so it is reasonable to assume that better parental ER may promote better child development.

The above-mentioned evidence has certainly contributed to the pressure that today's parents feel to regulate their emotions in the presence of their children (see the section "Antecedents of ER in Parenting"). This pressure is based on the assumption that "the more ER, the better" (for both parents and children). In reality, although ER is indeed a critical ability for parents, the linear assumption does not hold true. Too much pressure to exercise ER in parenting has negative side effects for both parents and children. Regarding parents, recent research shows that the harder parents try to regulate their emotions to comply with (their perception of) positive parenting display rules, the higher their risk of parental burnout (Lin et al., 2021), a disorder that has severe consequences for parents' mental and physical health (see Mikolajczak et al., 2021, for a review). Given that parental burnout drastically increases neglectful and violent behaviors toward children, pressure to exercise ER that is intended to promote children's development can ironically backfire against them.

In addition to the foregoing, there are at least three other reasons to suspect that too much self-focused and child-focused parental ER may be detrimental to children. First, the fact that parents are constantly regulating their own emotions prevents children from facing their parents' negative emotions and learning to cope with others' emotions in a safe context. Second, the fact that parents are continuously regulating their children's emotions to avoid them being distressed prevents children from learning and becoming autonomous in managing their own negative emotions: They remain dependent on others (coregulators) whenever they are emotionally overwhelmed and, therefore, cannot develop resilience. Combined, these two phenomena may contribute to the rise of "cotton wool children" (Nikiforidou, 2017)—that is, children who are protected from any unpleasant/adverse situation and who become fragile through lack of opportunity to develop strength and resilience.

Directions for Future Research

Despite the crucial importance of ER in parenting, the ER field has long overlooked the parenting domain. Research is now burgeoning, but much remains to be done. Methodologically, studies are urgently needed that go beyond cross-sectional designs. Longitudinal cross-lagged designs are of the utmost importance not only to infer causation (e.g., Does parental ER causally influence children's development?) but also to disentangle parent-to-child effects from the reverse (child behavior or attachment may reciprocally influence parents' ER). Studies including fathers and, ideally, triadic designs including child and two coparents alike, are also needed, as the effect of one parent's ER on the child may be potentialized or masked by the coparent's ER.

In view of what we have discussed in this chapter, another important direction is to go beyond linear conceptions (i.e., the notion that more ER is always better) and consider curvilinear hypotheses (i.e., that too much parental ER may actually be detrimental to some aspects of child development). The fourth direction consists in systematically distinguishing the effects of self-focused versus child-focused parental ER on each facet of child development. Finally, and crucially, there is a need to systematically include both child development *and* parental well-being as dependent variables (in order to remedy the current imbalance in the literature, which focuses on children much more than on parents—to the detriment of the latter). It is our hope that this chapter stimulates these studies and research at the intersection of ER and parenting more broadly.

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SECTION VI

SOCIAL ASPECTS

Groups and Collectives

CHAPTER 22

Regulating Collective Emotions

AMIT GOLDENBERG

When we think of emotion and emotion regulation, we typically think of them as processes occurring at the individual level. Even when emotions are experienced by multiple people who interact with one another, analysis is typically centered around individual-level processes. Recently, however, there is a growing realization that there is unique value in examining emotions not only at the individual, micro level, but also at the collective, macro level. These macro-level emotions are often called collective emotions (Goldenberg et al., 2020a), and they represent the aggregation of emotions of a certain collective in response to a specific situation as it unfolds over time. Research on collective emotions has received increased attention in the past few years as part of a broader realization that macro psychological processes, such as collective memory (Vlasceanu et al., 2018), collective attention (Shteynberg, 2015), and collective intelligence (Woolley et al., 2010), can capture unique aspects of social behavior and therefore deserve specific attention. Thus far, however, growing research on collective emotion has focused on emotion generation, paying almost no attention to whether and to what extent collective emotions can be regulated. The current chapter represents an attempt to explore the concept of collective emotion regulation. In light of the lack of existing empirical research on this topic, I have four goals in this paper: First, to define collective emotion regulation. Second, to define the notion of emotion regulation. Third, to review some of the strategies in which collective emotion can be regulated. Fourth, to discuss important future directions for research on collective emotion regulation.

What Is Collective Emotion?

I define *collective emotion* as a macro-level emotional response to a specific situation by multiple individuals who are interacting with one another. The most important aspect of this definition is that collective emotion is a macro-level phenomenon that is evaluated

when aggregating emotions of the collective as a whole. I wish to sidestep the rich philosophical debate of whether groups can or cannot have conscious experiences, such as emotions (Huebner, 2011), and merely say that measuring the emotions of a collective can provide unique information and improve prediction of its behavior. More specifically, there are situations in which collective emotion patterns cannot be captured by looking at individual-level emotions. For example, in some cases collective emotional intensity is increasing, while the emotional intensity of most individuals within that collective is decreasing (see Figure 22.1). This is caused by the fact that the rate of decay in individuals' emotions is counterbalanced by the rate of new activated individuals who are expressing their emotions. This example supports the claim that examining emotions at the collective level deserves specific attention.

The definition I propose to collective emotion also includes two necessary (but not sufficient) conditions for collective emotion. The first is that collective emotion is a response to a specific situation. This distinction is intended to differentiate collective emotions from other, longer-term, collective affective phenomena, such as mood or a

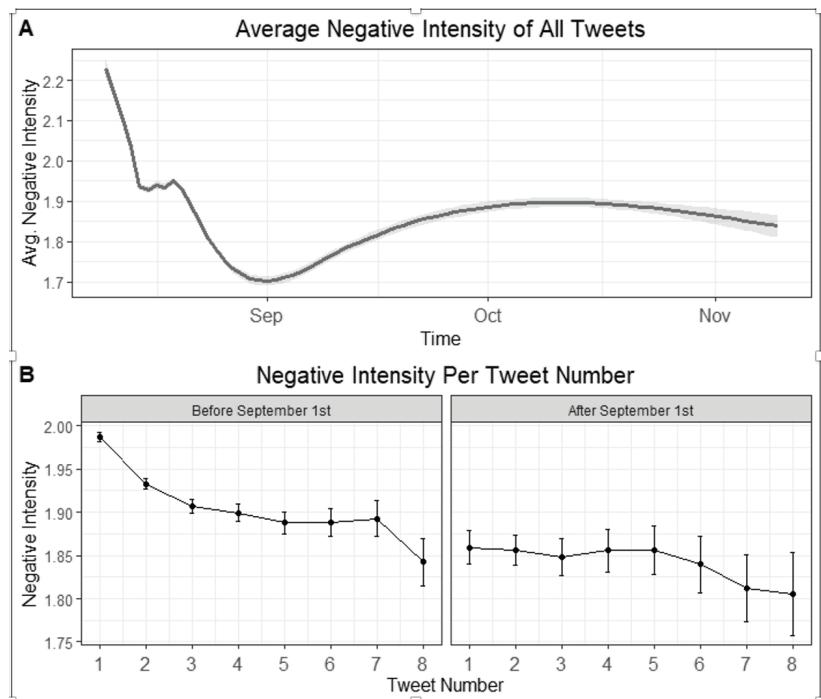


FIGURE 22.1. Emotions expressed in ~500K tweets in response to the Ferguson unrest (Goldenberg et al., 2020a). Negative intensity of tweets is evaluated using SentiStrength. Panel A shows mean emotional intensity of all tweets as a function of time. The pattern shows a reduction in negative intensity during August, and then an increase in collective emotional intensity from September 1 to the middle of October. Panel B shows negative intensity as a function of tweet number per individual, and data are divided into tweets before and after September 1. As seen in both Panel B graphs, users' eighth tweet in response to the incident was less negative than their first tweet, suggesting an emotional relaxation at the individual level. These graphs point to the fact that emotional patterns are temporally extended at the collective level compared to the individual level.

climate (de Rivera, 1992; Dodds et al., 2011). The second necessary condition is that collective emotion arises as a result of interactions between individuals. Interactions lead to changes in people's emotions via either processes of contagion or polarization, which contribute to some of the emerging properties that cannot be captured at the individual level (Goldenberg et al., 2020a). Emotional interactions also facilitate a sense of togetherness and a realization that the experienced emotion is "our emotion," which contributes to an increase in emotional intensity, a feature that is central to some of the classical work on this topic (Durkheim, 1912; Le Bon, 1896). It is important to note that many collective emotion researchers consider collective emotion to be driven only by emotional interactions leading to emotional convergence (Thonhauser, 2022; von Scheve & Ismer, 2013). In contrast, I argue that we can conceptualize a collective emotion that takes the form of two or more subgroups reacting differently to a situation or even become polarized over time (Goldenberg et al., 2020a).

What Is Collective Emotion Regulation?

Imagine an internet forum dedicated to stock discussions. After a disappointing earnings report by a specific company, its stock crashes, leading to a strong sense of anxiety in the investor community on the forum. At this point, many investors who hold the stock are motivated to calm down the community and mitigate the reduction in price. Therefore, following the reporting, various interpretations of the situation are suggested in an attempt to regulate the collective emotion. Some of these interpretations are rejected, but one interpretation that explains the disappointing report as a result of a potentially profitable investment that would later yield more profits, receives traction. As time goes by, more users adopt this interpretation, which contributes to a strong reduction in the anxiety expressed within the forum, and the stock price goes back to normal.

The above example represents a hypothetical scenario in which collective anxiety is regulated, in this case using cognitive reappraisal. I define collective emotion regulation as a process in which a subset of the group engages in behavior that has the goal of impacting the collective emotional response. The most important component of this definition is the fact that regulation is driven by a goal to impact the collective emotion (Gross, 2015). This does not mean that individuals have to be aware of their goal. The notion of a goal is merely a definitional tool designed to differentiate between emotion generation and regulation. Collective emotion regulation can be activated either in a top-down process, by a leader of the group who wishes to impact the collective emotional response, and it can also emerge as a bottom-up process, when an aggregated force of multiple people shares the same goal and are able to execute it by interacting with one another and with other group members.

Collective emotion regulation may seem similar to interpersonal emotion regulation, in which one individual regulates another individual's emotion (Niven et al., 2011; Zaki & Williams, 2013). While the two may be similar in some cases, especially ones in which the collective is a dyad (Brown et al., 2022), the fact that both the regulating agents and the target of regulation can comprise more than one person impacts regulation in important ways. For example, collective emotion regulation may be initiated by more than one person. This may lead to convergence both among regulators, as well as impact those who are being regulated (Páez & Rimé, 2014; von Scheve & Ismer, 2013). Such considerations are completely absent from traditional work on extrinsic regulation.

Strategies for Collective Emotion Regulation

People regulate individual emotions using a variety of strategies, but what are some of the strategies used for collective emotion regulation? The goal of the current section is to use the well-established process model of emotion regulation (Gross, 1998b, 2015) as a unifying framework to examine strategies for collective emotion regulation. Given that there is no research explicitly focused on the subject, I hope to form connections between the process model and other existing literatures of collective behavior, with the goal that such connections would generate more research in the future. As regulation may occur both as a top-down and bottom-up process, I hope to provide examples for both types in each strategy.

The first family of emotion regulation strategies involves changing emotions by targeting the emotion-eliciting situation. This is done by either choosing a certain situation as the target for collective emotion (situation selection) or changing the existing situation in a way that may lead to changes in the emotions associated with that situation (situation modification). One well-documented way of situation modification that is designed to impact a collective emotion is rituals. Groups develop rituals in order to both up-regulate or down-regulate collective emotion (Hobson et al., 2018). For example, rituals relating to death and mourning are often designed to enhance social support to reduce sadness (Norton & Gino, 2014). Rituals can both emerge naturally as a bottom-up process or may be orchestrated by a group leader who wishes to regulate the collective emotion. A second well-documented way in which collectives act to change certain situation is via collective action (van Zomeren et al., 2004, 2012). One central driver of collective action is emotions, often negative emotions, such as anger or outrage toward an inequity or a injustice. Collectives then strive to impact the emotion-eliciting situation by acting on it. Although collective action does not necessarily emerge with the direct goal of changing collective emotion, it is strongly driven by emotions, and tends to impact the collective emotion in important ways.

The second family of emotion regulation strategies involves changing emotions by modifying attention to the emotional stimuli. Attention is not only an individual property but is also shared by multiple individuals (Shteynberg, 2015). Similar to collective emotion, shared attention is contagious (Milgram et al., 1969) and is associated with a “sense of *us*,” that *we* are attending together to a certain target, which in turn leads to enhanced cognitive processing and to an increase in collective emotion (Shteynberg et al., 2014). We can conceive of collective emotion regulation occurring either by enhancing shared attention toward a situation that is likely to increase emotion, or by diverting attention away from a target to reduce such emotional response. This can be done by a collective leader trying to regulate a collective emotion (Griffiths, 1997), or merely as an emergent property occurring by bottom-up increased attention toward, or away from, a certain emotional stimulus.

The third family of emotion regulation strategies is called cognitive change, which involves changing how one thinks about the emotional situation or the emotion itself in a way that impacts the subsequent emotional response (Uusberg et al., 2019). As shown in the example above—which represents a case of regulation via reappraisal—bottom-up collective reappraisal is likely to involve a situation in which multiple reappraisals are offered and are then selected and consolidated to become part of the way that the collective interprets the situation (Schwartzstein & Sunderam, 2022). It is unclear yet, however, how and in what way this process emerges, and what are the reappraisals that are more likely to be selected by the collective. Reappraisal is often initiated by top-down

processes in which a leader or a prominent figure addresses and provides reappraisal with the goal of changing the collective emotion (Pescosolido, 2002).

The last family of emotion regulation strategies is called response modulation, and involves changing emotions by intervening on the actual emotional response. At the collective level, response modulations often occur when a member or members of the group change their own emotional response to a situation in a way that impacts the responses of other group members. Importantly, how individuals change their own responses may occur using a variety of strategies, but the main point is that the outcome of such regulation then impacts the individual's emotional expressions, which then impacts others in the collective in a way that changes their emotions. Recent empirical studies provide initial evidence for the occurrence of collective emotion regulation as a result of response modulation.

In a recent study, White participants read a guilt-inducing article about a segregated prom in upstate New York, in which White and Black students were asked to party in separate locations (Goldenberg et al., 2014). Participants were led to believe that other White readers of the article either felt a lot of guilt or no guilt. Results suggested that participants expressed stronger guilt when learning that others did not feel guilty in response to the article compared to when learning that others did feel guilty. Furthermore, higher levels of expressed guilt were mediated by participants' desire to change their emotions with the hope of impacting others' emotions. Later studies show that the tendency to amplify one's emotion indeed contributes to emotion contagion and a future increase of the collective emotion (Goldenberg et al., 2020b). Similar processes, in this case of attempts to down-regulate emotion via response modulation, were also documented in the context of parents' emotional responses to children's misbehavior (Goldenberg et al., 2017). Although these processes are examples of bottom-up processes, it is easy to imagine response modulation occurring as a top-down process. Imagine a leader who is keeping a positive emotion in response to a challenging situation with the hope of maintaining a positive collective emotion. Or on the flip side, maintaining a still face in response to adversity to reduce negative emotions (Eberly & Fong, 2013; Sy et al., 2005; Wang & Seibert, 2015).

Discussion: Overarching Questions for Research on Collective Emotion Regulation

The current chapter introduces the concept of collective emotion regulation. In the few remaining paragraphs, I hope to introduce three overarching questions that I think should be the first to be addressed in future research on collective emotion regulation.

The first question is *How* is collective emotion best regulated? Research at the individual level has paid increased attention to the question of what strategies seems to be more helpful in changing emotions (Gross, 2015). Similar questions can be asked for collective emotion regulation. For example, research on individual emotion regulation suggests that in many cases, using reappraisal seems to be more helpful in changing emotions than response modulations. Is the same true for collective emotion regulation? Response modulation is considered an ineffective strategy at the individual level, but could be an effective strategy to change collectives. Future research should further examine this question.

The second question is *How much effort* is needed to regulate a collective emotion? In other words, what is the relationship between the number of people regulating

the collective and the change in collective emotion? We can imagine a linear association between the number of regulators and outcomes—the relationship can also be exponential, such that any increase in the people regulating a collective leads to an exponential change in the collective emotion. This exponential process may be caused by the fact that regulators influence one another, which increases their impact on other group members. These relationships may obviously depend on many aspects, such as the strategies used for regulation, and the specific attributes of the group.

The third and final question is *When* are collective emotions best regulated? At the individual level, earlier intervention in the emotional process seems to be more helpful in leading to emotional change (Gross, 1998a). This is also likely to be true in collective emotion regulation. Earlier onsets of collective emotion include more variance between individuals that can be likely utilized for better regulation—however, there may be other opportunities for optimal intervention. Future research should examine these questions. My hope is that these questions and others would contribute to the increase in interest in collective emotion and collective emotion regulation and to the emergence of a new field of research in affective science.

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CHAPTER 23

Emotion Regulation in the Context of Discrimination PROGRESS AND CHALLENGES

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There are large and persistent health disparities between people based on their sociodemographic characteristics, including race/ethnicity, sexual orientation, gender identity, and socioeconomic status, among other factors (Ibe et al., 2021). These health inequities are due, at least in part, to a broad class of factors that epidemiologists call “social determinants of health” (e.g., Braveman & Gottlieb, 2014). These social determinants include structural factors, such as pervasive institutional discrimination and residential segregation, often resulting in limited employment and educational opportunities, substandard housing, lack of public safety, lack of neighborhood amenities and resources that promote health and, of course, unequal access to quality health care. In addition to these structural factors, work has linked exposure to interpersonal discrimination (i.e., forms of unequal treatment on the basis of identities like race/ethnicity, gender, or sexual orientation by other individuals) to adverse physical and mental health outcomes. Specifically, interpersonal discrimination has been characterized as a stressor that has negative implications for its targets’ psychological and physical well-being and contributes to group-level health disparities (Braveman & Gottlieb, 2014). Everyday instances of discrimination are linked to increased anxiety, anger, and distress in members of groups that face persistent discrimination (Banks et al., 2006; Hatzenbuehler et al., 2009). Hence, it is vital to examine how members of such societally stigmatized groups attempt to cope with their experiences and, further, to unearth strategies that may result in better health outcomes.

In this chapter, we review the role that emotion regulation plays in shaping the affective outcomes of interpersonal discrimination. We begin with the premise that stigma-based stressors, such as discrimination, typically lead people to engage in certain forms of emotion regulation (e.g., suppression) that, in turn, increase the risk of negative psychological and physical health outcomes. We then consider the efficacy of various forms of emotion regulation to promote more positive psychological outcomes of contending with group-based discrimination, noting potential constraints associated with the discrimination context that may limit efficacy. We follow this discussion with a charge to broaden the scope of the types of outcomes considered when assessing whether an emotion regulation strategy is adaptive. We close with a call for greater engagement between scholars of the psychology of intergroup relations, stigma and prejudice, and affective science in order to reduce the burden of discrimination on its victims.

Emotion Regulation in the Wake of Discrimination

Current theoretical frameworks identify five main classes of emotion regulation that occur across different time points related to the experience of an emotion/emotion-eliciting event: situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Webb et al., 2012). Although each strategy certainly applies to discrimination experiences, people engage in attentional deployment and response modulation most frequently when contending with discrimination (Gross & John, 2003; Hatzenbuehler et al., 2009). Unfortunately, these strategies also tend to yield negative downstream affective outcomes. Indeed, in the wake of experiencing discrimination, much like with other negative events, people tend to rely on self-immersed processing: a form of attentional deployment (Hatzenbuehler et al., 2009)—that is, people focus on specific details of the emotion-eliciting event from an immersed perspective, presumably to understand what happened to elicit the emotions they are experiencing. Although common, self-immersed responses to discrimination are associated with the maintenance, if not the exacerbation, of negative affect and psychological distress (Hatzenbuehler et al., 2009).

Similarly, suppression—a form of response modulation—is a common response to discrimination. Suppression involves attempting to reduce the experience of an emotion, the expression of an emotion, such as in one's facial expressions or body language, and/or the thoughts about the discriminatory event that elicit negative emotions (Webb et al., 2012). For instance, women often suppress their emotional reactions when they experience sexist behavior (e.g., Shelton & Stewart, 2004), a phenomenon found among members of other marginalized groups in the face of group-based discrimination (see Hatzenbuehler et al., 2009; Richeson & Shelton, 2007). Although often necessary to successfully navigate the social contexts in which individuals experience discrimination (i.e., work, school, etc.), suppression is cognitively and emotionally taxing (Johnson & Richeson, 2009) and leaves individuals more susceptible to engaging in behaviors that undermine health (Inzlicht & Kang, 2010).

Given the known negative outcomes of self-immersion in and suppression of discrimination experiences, research has begun to explore whether cognitive change emotion regulation strategies may be effective in this context, much like what has been found for coping with negative events and stimuli more generally (e.g., Webb et al., 2012). Cognitive change strategies (often termed *reappraisal strategies*) involve efforts to modify thoughts about, or interpretations of, situations to alter their emotional impact (Gross, 1998), and

have consistently been linked to adaptive affective outcomes (e.g., reduced negative affect) in the face of general stressors (e.g., Ayduk & Kross, 2008). Self-distanced reappraisal, which involves taking a more neutral, third-person perspective when thinking about one's own negative or stressful experience (e.g., Ochsner et al., 2004), has been associated with increased emotional (e.g., decreased anger), and physiological (e.g., lower blood pressure reactivity) well-being, relative to self-immersion (Ayduk & Kross, 2008). The results of recent work examining the effects of self-distanced, relative to self-immersed, processing of past experiences of discrimination, however, are less optimistic (Duker et al., 2022a). Specifically, several studies have observed small or, even, null effects of self-distanced reappraisal compared with self-immersion in reducing the negative affect women experience after contending with their past experiences of sexism (Duker et al., 2022a).

Although self-distanced reappraisal may not reliably reduce negative affective outcomes when contending with past experiences of discrimination, there has been some work suggesting that other forms of cognitive reappraisal may, at least under certain circumstances, foster positive psychological outcomes among members of marginalized groups (e.g., Inzlicht & Kang, 2010; Perez & Soto, 2011). For instance, recent research suggests that positive reappraisal may be broadly helpful for members of marginalized groups. Positive reappraisal involves the reappraisal of an emotional stimulus or event in which individuals reconstrue it as benign, beneficial, or even meaningful (Garland et al., 2011). Positive reappraisal can take many forms, including generating a redemption narrative—that is, a story about growing from negative life experiences and hardships (McAdams, 2001). The spontaneous generation of redemption narratives has been positively associated with self-esteem and life satisfaction, and negatively associated with depression (McAdams, 2001). Recent work suggests that positive reappraisal via generating redemption narratives may be effective in mitigating the negative affective consequences of contending with discrimination. Specifically, generating a redemption narrative, compared to engaging in self-distanced reappraisal and self-immersion, blunts negative affect and bolsters positive affect in women contending with past experiences of sexism (Duker et al., 2022a; see also Mosley & Branscombe, 2020) and Black Americans contending with past experiences of racism (Duker et al., 2002b). Taken together, this research suggests that at least some forms of cognitive reappraisal may reduce the psychological burden of discrimination.

Reexamining Reappraisal in Context

The research reviewed previously suggests that at least some forms of cognitive reappraisal proven effective outside of the discrimination domain (Ayduk & Kross, 2008; Gross, 1998; Webb et al., 2012) may not reliably yield positive emotional outcomes as people contend with group-based discrimination (e.g., Duker et al., 2022a; Perez & Soto, 2011). Reappraisal affordances—the opportunities inherent in a stimulus or event to reconstrue, reinterpret, or reframe it (Suri et al., 2018)—may help explain the varied outcomes of reappraisal in this context. Quite simply, some experiences are challenging to reframe, including those that are high in intensity and negative valence (Ford & Troy, 2019). Discrimination experiences may provide few reappraisal affordances for their victims. Not only are such experiences typically quite negative and intense (e.g., Utsey et al., 2008) but because discrimination is connected to a largely unchangeable aspect of an individual's social identity (e.g., Major & O'Brien, 2005), the most accessible

ways to alter the situation are not relevant—that is, the target of discrimination cannot and should not have to be a different race, gender, sexual orientation, and so on to be treated fairly. Consequently, interpersonal discrimination can be more distressing than most other interpersonal stressors (Brondolo et al., 2003).

The broader social or environmental context may also shape what, if any, reappraisal affordances are available when contending with group-based discrimination. Research finds, for instance, that the success of reappraising discrimination experiences is moderated by the extent to which societal discrimination against the larger group is perceived (or known) to be pervasive versus rare (Perez & Soto, 2011; Soto et al., 2012; see also Hatzenbuehler et al., 2009). It may simply be more difficult to generate reappraisals for discriminatory events when discrimination is a pervasive component of an environment. Perhaps this is why positive reappraisal through benefit finding and/or the generation of a redemption narrative is reliably effective in the discrimination context (Duker, 2022a). This form of positive reappraisal does not require the event, or social context, to be reconstrued, but, rather, the discrimination is connected to something valuable in the present, providing the experience with new meaning. Taken together, this work underscores the importance of taking into consideration features of the discrimination context (i.e., group level, uncontrollable components of the self, societal hierarchical power relations) when attempting to discern which emotion regulation strategies will be effective (and why).

Is Effective Emotion Regulation Necessarily Adaptive? Considering Multiple Outcomes in Discrimination Contexts

Although understanding which emotion regulation strategies are likely to be effective when contending with discrimination and why is vital; here we argue that an emotion regulation strategy's efficacy in reducing individuals' negative affect should not be equated with its overall "adaptiveness." Indeed, in the context of discrimination experiences, at least, both the efficacy of an emotion regulation strategy and its functionality—that is, its alignment with individuals' broader goals and needs—should be considered when classifying it as either adaptive or maladaptive. Instead, we think it important to consider intrapersonal, interpersonal, and group-level outcomes of an emotion regulation strategy when assessing both whether it is adaptive, as well as its overall value.

Consider, for instance, the putative impact of reappraisal when contending with outcomes that are appraised to be injustices (such as discrimination). Reappraisal in this context, as in others, is typically forwarded as adaptive because it reduces individuals' negative emotions, including their anger. But the negative emotions that are often triggered by discrimination and other injustices, such as anger, are often the fuel that motivates people to fight for social change, be it through individual efforts or collective action—any response or behavior with the goal of redressing the disadvantages faced by one's ingroup (e.g., van Zomeren et al., 2012). Engaging in strategies that reduce these emotions, then, may reduce engagement behavior that could reduce the likelihood that both individuals and members of the relevant social identity group experience discrimination in the future (see Ford et al., 2019).

Moreover, some emotion regulation strategies (e.g., suppression) are often characterized as maladaptive, since they tend to be associated with negative intrapersonal outcomes (Webb et al., 2012). Suppressing one's emotional reactions in response to discrimination

can be protective for members of socially stigmatized groups, as they often face backlash from members of dominant groups when they even assert, much less try to confront, the discrimination they have faced (e.g., Kaiser & Miller, 2001). Even displaying negative emotional reactions in response to discrimination can be punished (e.g., Archer & Mills, 2019). Our point here is not that the suppression of emotions/emotional facial displays is healthy. Indeed, the work on “John Henryism” and skin-deep resilience (e.g., Brody et al., 2013; James, 1994) suggest just the opposite. But members of stigmatized social groups may judge the intrapersonal costs of suppression in the wake of discrimination to be better than the potential interpersonal costs, which often have long-term material consequences (losing income, educational opportunities, etc.). In other words, despite being cognitively, affectively, and even physiologically draining, putatively maladaptive emotion regulation strategies, such as suppression, used to respond to discrimination may be adaptive in the environments in which they often occur (workplace, school, interactions with police officers). On the other hand, putatively adaptive emotion regulation strategies, such as reappraisal, in response to discrimination may undermine efforts to change the status quo due its palliative effects on emotions (e.g., anger) that motivate collective action.

Road Map for Future Work

The research reviewed here highlights the need for additional work exploring the different types or, perhaps, combinations of emotion regulation strategies that are protective and efficacious in the context of discrimination, as well as examining when (and under what contexts) such strategies are likely to occur. Given the complexity of discrimination experiences, a variety of study designs need to be leveraged to pursue these questions. For instance, considerable research on this topic asks participants to recall and then relive a past experience of discrimination (e.g., Hatzenbuehler et al., 2009; Inzlicht & Kang, 2010). This is the paradigm in which the promise of positive reappraisal through the generation of redemption narratives was revealed (Duker et al., 2022a). When someone is actively experiencing discrimination, it is probably both more difficult and, possibly maladaptive, for the person to begin to look for potential benefits that may come from being discriminated against. In other words, the time course of a discriminatory event is relevant to the value of different emotion regulation strategies and research on this topic should begin to consider this factor more explicitly.

In addition, studies are needed to compare the emotion regulation strategies used (and successfully employed) by people from marginalized and nonmarginalized groups, in response to discrimination-based, compared to other, stressors. Similarly, the value of different strategies across varying contexts of discrimination (e.g., sexism, racism, ageism) remains in need of investigation. Further, longitudinal studies are necessary to begin to answer questions related to the longevity of “successful” emotion regulation strategies, considering different outcomes across different domains (health, relationships, wealth/income, educational outcomes, etc.), and different levels of analysis (self, family, group, organization, society). Given the negative effects that discrimination has on its targets’ well-being, understanding whether and which emotion regulation strategies could be recruited to disrupt individuals’ psychological distress, while perhaps also promoting collective action and other forms of dismantling the structural and/or motivational roots of the discrimination, is of the utmost importance.

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CHAPTER 24

Coping with Stigma

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This chapter presents an overview of how individuals who are subjected to negative stereotypes, prejudice, and discrimination cope with stigma, with a particular focus on emotion regulation strategies. I aim to highlight strategies used to cope with stigma that sit at the intersection of two domains: type (cognitive and behavioral) and engagement versus disengagement (see Table 24.1). Cognitive strategies center on psychological processes, whereas behavioral strategies focus on behaviors as a primary way to regulate emotions. Engagement coping is broadly defined by approaching the stressor or its associated emotions, whereas disengagement is distancing oneself from the stressor or related emotions. I identify two characteristics that have received limited attention that shape these coping strategies: the nature of the stigma-based stressor and one's sociocultural history. I conclude with considering intersectionality as an important framework to guide future work in this area.

Integrating Stress and Coping with Emotion Regulation

There is a vast literature outlining the overwhelmingly negative consequences of stigma. At its core, stigma occurs when individuals are devalued within a particular context because of an attribute or social identity that they have or are perceived to have (Crocker et al., 1998; Jones et al., 1984). Therefore, identification with a social group or being “marked” with an attribute that is perceived as flawed may be subject to the consequences of being stigmatized.

Understanding the consequences of stigma has often been framed via transactional models of stress and coping (Lazarus & Folkman, 1984; Major & O'Brien, 2005; Miller & Kaiser, 2001), identifying stigma as a stressor eliciting a stress response. Individuals' responses lie in their appraisal of the stressor as taxing or exceeding their resources to effectively cope with the stressor and impacting their well-being. That individuals vary

TABLE 24.1. Coping Strategies in Response to Stigma by Strategy Family and (Dis)engagement Coping

Type of strategy	Engagement coping	Disengagement coping
Cognitive strategies	<p><i>Meaning making:</i> Finding a purpose in or meaning for a stigma-related stressor. Example: A strengthening of one's stigmatized identity in response to a stigma-related event.</p> <p><i>Attribution change:</i> Making an external versus internal attribution for stigma. Example: Attributing an experience of stigma to someone's prejudice as opposed to believing a person deserved such treatment.</p>	<p><i>Denial or minimization:</i> Deny or minimize that one is the target of stigma. Example: Believing that an experience of harassment is not important.</p> <p><i>Distraction:</i> Engaging in cognitions and behaviors that direct attention away from emotional stimuli. Example: Focusing one's attention on something pleasant and not related to the stigma.</p>
Behavioral strategies	<p><i>Seeking social support:</i> Seeking assistance or comfort from others. Example: Reaching out to friends or family to vent.</p> <p><i>Collective action:</i> Engaging in activism. Example: Going to a protest that advocates for improved treatment of one's ingroup.</p>	<p><i>Escape or avoidance behaviors:</i> Engaging in behavior that avoids engaging with aversive affective states resulting from stigma. Example: Drinking alcohol to deal with one's negative mood.</p> <p><i>Concealment:</i> An active attempt to prevent disclosure of a stigma. Example: Avoiding conversations where one's stigmatized identity may be brought up.</p>

in their appraisal of stressors and their ability to cope, which are impacted by context, suggests a diversity of responses to the same stressor.

Compared to other stressors, stigma places unique demands on the individual because of their specific devalued characteristic, making stigma particularly stressful and evoking primarily negative affective responses (Miller & Major, 2000). Despite stigma being context dependent, it is regarded as a relatively chronic stressor considering that stigma is embedded into social and cultural structures.

Within the stress and coping framework, the response to stigma-based stressors is dependent on how an individual cognitively appraises the situation/event and the availability of resources to cope with the demand. Though individuals mount involuntary responses to stigma (e.g., rumination), coping refers to efforts to regulate emotion, physiology, behavior, cognition, and the environment in response to stressful events (Compas et al., 2001). Within this perspective, there are clear connections between coping with stigma and emotion regulation. Both require some measure of control to regulate affective states when it is relevant for an individual's current goal, as well as recognizing how contexts can shape these efforts (Gross, 2015). Unlike emotion regulation, which includes regulating positive and/or negative emotions, coping with stigma can be regarded as mitigating generally negative affective states. Identifying strategies to decrease these negative states has historically been the focus of coping with stigma.

Importantly, coping efforts are divorced from its outcomes such that not all coping strategies will be successful and may in some circumstances be harmful (Compas et al., 2001), which suggest that identifying effective coping strategies may be a learned skill. Though it places the burden on the stigmatized to cope the "right way" within specific contexts (e.g., salience of the "mark"), it acknowledges the stigmatized as individuals

with agency and resilience to overcome the pervasive and detrimental effects of stigma (Crocker & Major, 1989). Because several reviews of emotion-focused coping strategies in response to stigmatization exist (e.g., Crocker et al., 1998; Major & Townsend, 2010), this chapter serves as a highlight of the coping strategies used to regulate emotions in response to stigma.

Which Coping Strategies Regulate Emotions in Response to Stigma?

There are a number of strategies used to cope with stigma that can be organized across two dimensions: type (cognitive, behavioral) and engagement versus disengagement coping. While choice of coping strategy and its associated effectiveness is contingent on various factors, generally disengagement strategies tend to be adaptive in the short term but maladaptive as a long-term strategy, particularly when compared to engagement coping. Coping strategies are discussed below by type but are further characterized by their (dis) engagement in Table 24.1.

Cognitive Strategies

Stress and coping frameworks and process models of emotion regulation (Gross, 2015) recognize appraisal as central to shaping any given response. Reappraisal, demonstrated by changing an original appraisal, are common cognitive strategies in coping with stigma. One manner of reappraisal is to deny or minimize that one is the target of stigma. This strategy avoids negative affective states by denying the existence of prejudice and discrimination or minimizing the role that stigma may have on their well-being. For instance, one may believe that harassment by a colleague is not important or does not interfere with their immediate goals, thereby mitigating any negative consequences of stigma. This strategy may make stigmatized individuals feel less vulnerable to stigma and perceive their situation as less threatening (Major et al., 2002). Denying may also protect the individual from acknowledging the presence of an unfair system given that people are motivated to believe in an overall fair system (Bahamondes et al., 2019). Though this strategy may be adaptive in the short term, it may be a maladaptive long-term strategy by passively “accepting” stigma as a way of life.

Another cognitive strategy is to engage in positive reappraisal, such as meaning making. Engaging in a strategy to derive meaning from exposure to stigma includes appraising the stressor as a challenge (vs. threat). This strategy elicits a sense of empowerment and resilience, which facilitates positive affect and mitigates downstream negative affective states insofar as meaning is made. Individuals also engage in meaning making by reaffirming or strengthening their stigmatized identity following a stigma-related stressor as a way of protecting their self-esteem and increase feelings of belonging (Branscombe et al., 1999). That positive reappraisal has been identified as important for emotion regulation in the face of discrimination (Duker et al., 2022) suggests it as a potential point for intervention and promotes the stigmatized as active agents to resist and thrive in the face of stigma.

As another form of reappraisal, one could also change their attributions explaining the experience of stigma. For instance, one might make an external attribution of social rejection as a characteristic of the perceiver instead of an internal attribution, or personal characteristic. Attributional models of emotion indicate that negative emotions are more likely when internal attributions are made toward negative outcomes than when they are attributed to external factors. Because there is an innate desire to view oneself and their

social group positively, making external attributions toward prejudiced events enhances self-esteem (Crocker & Major, 1989) and rightly places the responsibility of stigma onto others and dominant social structures—however, in the absence of clear situational cues that may denote prejudice, a stigmatized individual may be more apt to make internal attributions for rejection, which have negative consequences (e.g., lowering self-esteem).

Distraction is another cognitive strategy that can help regulate the intensity of the emotional response and disrupt rumination, curtailing stigma-related distress. Distraction involves engaging in cognitions and behaviors that redirects attention away from aversive emotional situations/conditions (Aldwin, 2011). For instance, individuals who engaged in distraction reported improved mood (less psychological distress) following a stigma-related stressor, while individuals who engaged in rumination maintained high levels of distress (Hatzenbuehler et al., 2009). While research has generally pointed to the adaptive nature of distraction via cognitions, evidence for the long-term effectiveness of distraction via behaviors may be dependent on the specific behavior, discussed in the next section.

Behavioral Strategies

Stigmatized individuals also cope with aversive affective states resulting from stigma by engaging in escape or avoidance behaviors. Stigmatized people may actively avoid environments where stigma occurs or may be expected (Pinel, 1999). Though this strategy maintains stigma by keeping the stigmatized “away” from the nonstigmatized (Link & Phelan, 2014), it may be especially advantageous if the stigmatized perceive few benefits (e.g., social connection) from being in situations where stigma is anticipated. People also engage in various physical escape and avoidance behaviors to cope with stigma, such as alcohol use and smoking, among others (Pascoe & Richman, 2009). Though there are strong relations between stigma and unhealthy behaviors (e.g., alcohol use), evidence of engagement in other avoidance behaviors is mixed (e.g., exercise). Irrespective of their long-term consequences, all aim to buffer or eliminate the immediate negative affect resulting from stigma. In severe instances, some may try to “escape” their stigmatized characteristic if it’s perceived as mutable (e.g., getting gastric bypass surgery to escape weight-based stigma). Individuals unable to do so may attempt to hide their stigmas, if possible.

For individuals with nonvisible stigmas (those not readily apparent), concealing a stigma is another behavioral strategy. Concealment, an active attempt to prevent disclosure of one’s stigmatized identity, may serve as an adaptive short-term coping strategy to avoid future victimization and subsequent negative affective response. For instance, concealment may be particularly beneficial if disclosing one’s stigma may interfere with current goals and if stigmatized individuals perceive their environments to be hostile (Quinn, 2018). Importantly, concealment has significant consequences as a long-term coping strategy, as it can become a significant source of stress with adverse affective (e.g., thought suppression, depression) and coping (e.g., reduced social support access) implications.

Seeking social support can also serve as a behavioral emotion regulation coping strategy. The benefits of social support are well documented and generally serve to buffer stress (Cohen & Wills, 1985). For instance, social support provides individuals with a way to express their emotions, help with reappraisal, and serve as a distraction from the stigmatized event (Compas et al., 2001). Social support’s effectiveness, however, may depend on whether those providing support are ingroup (those included in one’s group) or outgroup (those not included in one’s group) members. Whereas outgroup members may meet some of the needs of the stigmatized (e.g., source for venting), ingroup members may offer greater insight for reappraisal (Haslam et al., 2004) and validation—yielding greater

benefits. Seeking social support may also manifest in self-segregation. Limiting social interaction to ingroup members may circumvent stigma and increase self-validation, but it may also limit access to resources (e.g., knowledge) known only to outgroup members (Schmader & Sedikides, 2018), which may diminish effective coping. Social support may also play an important role for reducing societal stigma, such as engaging in collective action.

Organizing for collective action is one avenue by which individuals who experience unfair treatment share their feelings of dissatisfaction toward an unjust system. Stigmatization can yield action-oriented emotions like anger, an affective state aroused by moral situations and an other-directed emotion associated with external attributions (Weiner, 2014). Anger is a common affective response when individuals perceive stigma as impacting their ingroup and is associated with perceived injustice. Importantly, anger mediates the relationship between perceived unfairness and collective action tendencies (van Zomeren et al., 2004). This suggests that under certain conditions, collective action is simultaneously an emotion-focused coping strategy and a motivator for change in the sociocultural structures that gave rise to stigma in the first place.

What Characteristics Shape Coping Responses?

There is a recognition that coping responses to stigma are shaped by numerous factors, such as characteristics of the stigma, person, situation, and sociocultural context (see Major & Townsend, 2010, for a review). Two that have received less attention are the nature of the stigma-related stressor and one's cultural history.

One characteristic that may shape coping responses is the nature of the stigma-related stressor. Stigma can manifest in different ways, including, but not limited to, major life events (e.g., being denied housing), daily microaggressions (e.g., being followed while shopping), and implementation of new policies (e.g., being banned from activities). Experiences that are perceived as unique and significant, such as major life events or implementation of new policies, may be more apt to elicit activated negative affective states, such as anger and frustration, that signal an important unachieved goal (e.g., not getting the job). Daily slights, however, may not be perceived as unique events given their chronicity, be perceived as less severe, and less likely to impede meeting one's goal. As such, they may be more likely to elicit deactivated negative affect states, such as disappointment. Given that responses differ as a function of level of arousal (e.g., preserving energy in response to low arousal states, mobilizing energy in high arousal states; Carver, 2004), stigmatized individuals may engage in different coping strategies as a function of the different affective states elicited by major versus minor stigma-related stressors.

A stigmatized individual's sociocultural history can also shape coping responses. Growing evidence indicates the presence of group differences in coping styles across numerous identity dimensions, such as race and sexual orientation. The extent to which there are differences may, in part, derive from an individual's cultural background and historical context. For instance, African Americans have historically been grounded in a strong religious belief system, a collective social orientation, and affective expressiveness (Utsey et al., 2007) likely deriving from the need to contend with a legacy of racism. As such, African Americans may be predisposed toward specific forms of coping strategies, such as engaging social support or prayer due, in part, to their sociocultural history. Conversely, sexual minorities may be less likely to use prayer given their historical persecution by religious organizations and may instead engage in concealment, social support, and alcohol use, given bars historically being a respite from concealing their stigmas and

a source of community connection (Trujillo & Mendes, 2021). Though individuals have multifaceted connections to their stigmatized identity, an individual's sociocultural history is likely an important consideration for coping.

Future Directions

While coping with stigma has received considerable attention in the literature, there remain several areas ripe for additional study. There has been increased interest in applying an intersectional framework to several psychological domains, including stigma. Intersectional stigma as a concept has emerged from this attention to consider the intersection of multiple stigmas within a person and understand their effects (Bowleg, 2012). In contrast to an additive approach whereby stigma's effects are (literally) added together, intersectional stigma seeks to reflect the unique experiences of individuals with multiple intersecting stigmas (e.g., Black lesbians, individuals with HIV and larger bodies) that counter this additive (analytical) perspective. How an individual appraises a stigma-based stressor and subsequently copes is likely to be impacted by their lived experiences as a person with more than one stigma. Each stigma may have its own unique effects on access to the resources necessary for effective coping. For instance, a Black lesbian may attribute an ambiguous stigma experience to race, sexuality, or both, which impacts which form of coping may be effective. Concealment may be an option if stigma is attributed to sexuality but not so for race.

An intersectional perspective can also help identify new coping strategies, particularly as they relate to identification with one's stigmatized identities. Identification with one's ingroup may both increase and decrease in response to stigma and this may either hinder or facilitate effective coping. To increase complexity, relatively little is known about how stigmatized individuals navigate multiple identities in response to stigmatization, especially if more than one stigma is targeted. While work on understanding multiple identities exists (Kang & Bodenhausen, 2015), this has often been limited to race and one other identity. Expanding on this intersectional work can bring us to a fuller understanding on how multiply stigmatized people experience and cope with exposure to stigma. Future work on coping with stigma should consider an intersectional framework for understanding stigma and effective coping for multiply marginalized people taking care to center their experiences and knowledge as acts of resistance and resilience.

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CHAPTER 25

Emotion Regulation and Conflict Resolution

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Emotions play a central role in many aspects of our lives. In the contexts of ongoing intergroup conflicts, when people suspect that their fundamental beliefs, identities, and even their existences are threatened, emotions are especially pronounced. In such challenging contexts, group-level emotions—namely, emotions caused by felt belongingness to a group and targeted at another group or its representatives (Smith et al., 2007), such as fear, anger, humiliation, and hatred—powerfully shape public support for conflict-related policies. Moreover, group-level emotions also drive people's personal action tendencies when faced with conflicts. These tendencies include, among other things, motivation for contact with the adversary, openness to new ideas that can potentially promote conflict resolution, and engagement in pro-peace or antiwar collective action.

Empirically, the effect of emotions on the outcomes mentioned above remains significant even when controlling for more “traditional” predictors of conflict-related policies or behaviors, such as political ideology, socioeconomic status, and conflict-related personal experiences. This was demonstrated in studies conducted in the recent two decades showing meaningful effects of different emotions on various conflict-related outcomes, like support for compromise (Halperin, 2008), ingroup bias (Gur et al., 2021), aggressive and conciliatory attitudes (Rosler et al., 2017), or collective action (Cohen-Chen et al., 2015).

These findings have motivated researchers and practitioners to investigate how emotions can be changed in conflict situations. Emotion regulation is the process by which individuals influence which emotions they experience and how and when they experience and express them (Gross, 1998, 2015). Emotion regulation can involve increasing, maintaining, or decreasing positive or negative emotions (Gross, 2015). Studies over the last few years have integrated conflict research with the field of emotion regulation, thus creating a new perspective of the avenues to reduce conflict and advance peace (see Avichail et al., in press; Čehajić-Clancy et al., 2016; Halperin, 2016, for reviews). In the current

chapter, three main approaches for regulating emotions in the context of conflicts are reviewed: motivational change that targets the motivation to regulate emotions, direct emotion regulation that involves an explicit goal to influence emotions using established emotion regulation strategies, and indirect emotion regulation in which different messages or themes are used to influence emotions implicitly (Halperin, Cohen-Chen, et al., 2014). Finally, some open questions are presented, followed by initial suggestions for future work in that area.

Motivation-Focused Interventions

In the context of intergroup conflict, research shows that often people wish to maintain their conflict-related destructive emotions, or even increase their intensity (Porat et al., 2016), posing a challenge to directly reducing these emotions. This challenge can be addressed by explicitly influencing people's motivation to regulate their group-level emotions. By motivating people to increase (or decrease) particular group-level emotions, research based on this approach aims to alter emotion regulation in the intergroup setting. Recent studies both outside and inside of the context of intergroup conflicts have demonstrated that manipulating what people want to feel may be as (or even more) effective as training them to use beneficial strategies, such as cognitive reappraisal (Tamir et al., 2019).

Specifically in the context of violent conflicts, activating prohedonic goals among Jews within the context of the Israeli–Palestinian conflict, was just as effective in decreasing negative emotions as was activating prohedonic goals using only a reappraisal intervention (Tamir et al., 2019). Other studies in the same context, targeting people's motivation to down- or up-regulate group-level emotions, were successful in reducing outgroup anger and fear, which diminished support of intolerant political policies toward the out-group (Porat et al., 2016). Motivation-based interventions are effective not only when directed at negative outgroup emotions but also when directed at positive ones. In a set of studies along these lines that were conducted in Israel and the United States, researchers increased the motivation to experience outgroup empathy by manipulating the belief that empathy is an unlimited resource. This, in turn, led to a significant increase in outgroup empathy, support for prosocial actions, and empathic behaviors (Hasson et al., 2022). Both of these studies suggest that intergroup emotions may ultimately be influenced by changing societies' emotional goals (i.e., desired emotions in an intergroup context). They also emphasize the importance of targeting motivation in emotion regulation when designing intergroup emotion regulation interventions.

Direct Emotion Regulation

Direct emotion regulation includes an explicit goal to influence emotions using one or more established emotion regulation strategies like situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross, 1998, 2015). Research in the context of intergroup conflicts using direct strategies, such as situation selection (Schultz, 2014) and expressive suppression (Burns et al., 2008; Westerlund et al., 2020), is still in its early stages. Therefore, we focus on the most studied direct emotion regulation strategies—namely, reappraisal and acceptance—with evidence across types of conflicts and contexts.

Reappraisal, which is likely the most widely studied strategy, is a direct emotion regulation form of cognitive change where individuals appraise a situation differently from how they did initially in order to change its emotional impact (e.g., Ford et al., 2019; Halperin et al., 2013; Hurtado-Parrado et al., 2019). Individuals who participate in reappraisal interventions often go through a training phase in which they reappraise multiple emotional triggers before applying the method to various intergroup-related stimuli. Reappraisal instructions include statements like “One way to manage emotions is to reconsider or reframe situations such that they are less upsetting and more hopeful” (Ford et al., 2019) or “respond to them [the stimuli] like scientists, objectively and analytically, trying to think about them in a cold and detached manner” (Halperin et al., 2013).

When experimentally tested in the context of intergroup conflicts, reappraisal interventions were found to impact outgroup emotions, attitudes, and behavioral intentions. For example, reappraisal successfully reduced intergroup anger, irritability, fear, and uneasiness, as well as promoted support for conciliatory policies within the context of the armed conflict between the Colombian government and the Revolutionary Armed Forces of Colombia (FARC; Hurtado-Parrado et al., 2019). Furthermore, applying reappraisal in politically heated situations, such as the political polarization in the United States, resulted in a significant reduction in negative emotional responses toward the government (Ford et al., 2019). In Finland, reappraisal training increased acceptance of outgroups (Westerlund et al., 2020), and in two studies conducted in Israel, reappraisal reduced levels of political intolerance of Jewish Israelis toward Palestinian Israelis and toward their least-liked outgroup (Halperin, Pliskin, et al., 2014). In another set of studies, reappraisal increased Jewish Israelis’ support of conciliatory policies in regard to the Israeli–Palestinian conflict (Alkoby et al., 2017; Halperin et al., 2013). These findings were replicated using a mobile app reappraisal intervention, which revealed a decrease in overall support for aggressive policies directed at the outgroup (Porat et al., 2020). Although the majority of these studies looked only at short-term effects, at least one study found that reappraisal training had lasting effects up to 5 months after the initial training (Halperin et al., 2013).

Another direct emotion regulation strategy employed in intergroup conflicts is emotional acceptance, which entails an active readiness to experience thoughts, emotions, and sensations with an open mind (Williams & Lynn, 2010). There are numerous definitions and operationalizations of acceptance—however, here we focus on those that instruct individuals to accept their emotions without judgment. In experimental studies within the context of intergroup conflicts, emotional acceptance reduced bias and animosity toward Muslims among U.S. participants after the 2013 Boston Marathon terror attack (Steele et al., 2019). Furthermore, mindfulness interventions that encourage the practice of emotional acceptance have been found to reduce implicit age and race bias (Lueke & Gibson, 2015), reduce racial discrimination in a simulation trust game (Lueke & Gibson, 2016), and increase support for political compromise with the outgroup (Alkoby et al., 2017). This is supported by a recent systemic review of mindfulness interventions that found a small but significant effect in reducing intergroup bias (Oyler et al., 2022).

Indirect Emotion Regulation

Training in direct emotion regulation strategies can definitely enhance peace-oriented reactions to political events—however, the challenge with direct emotion regulation training is that it requires people to be motivated to change their emotions in a direction

conducive to peace promotion (Tamir, 2009)—therefore, limiting the applicability of these interventions in the context of intractable conflict. To overcome that limitation, indirect emotion regulation is utilized as a way to at least partially circumvent motivation. By identifying the appropriate discrete emotion for regulation, we can use interventions that modify emotion's core appraisal themes, and so affect emotional reactions to subsequent events, and corresponding political preferences (see Halperin, Cohen-Chen, et al., 2014, for review). This is somewhat similar to the cognitive process embedded within reappraisal strategy, only that it does not include direct instructions to reappraise.

Unlike the direct emotion regulation approach, which utilizes more general interventions to influence emotions, the indirect approach aims to form more tailored interventions targeted at discrete intergroup emotions. Given the specificity of the emotion-action tendency association (Frijda, 1986; Scherer, 2004), the first step is identifying the target action tendency and its association with the desired conflict-related process (e.g., contact motivation, support for humanitarian aid). The following step is to link that association to a discrete emotion. For example, for increasing contact motivation, the targeted discrete emotion is reducing intergroup anxiety. On the other hand, if a goal is to raise support for providing humanitarian aid to the adversary outgroup, the target emotion is most likely promoting empathy.

After identifying the discrete target emotion, we need to identify the concrete message or process that allows that emotion to be regulated. This is based on the emotion's core appraisal theme (Roseman, 1984; Scherer, 2004), which constitutes the foundation for its motivational and behavioral implications. We believe that, by changing this core appraisal theme, similarly to reappraisal, we can regulate the associated emotion and thus transform emotional goals, as well as conflict-related action tendencies. For example, changing the appraisal of the outgroup's actions deemed unfair may reduce intergroup anger, and changing the depiction of the outgroup as threatening would reduce outgroup fear.

The third step after identifying the target core appraisal theme is searching for a countermESSAGE or psychological process that might potentially reduce adherence to that very theme. This can be accomplished by presenting direct counterevidence (e.g., the outgroup had well-justified reasons to carry out a specific action). Such a tactic, on the other hand, could elicit antagonism and even backfire. Alternatively, we can create a subtler intervention by adjusting the principles of preexisting sociopsychological interventions. For example, existing power or self-/group efficacy manipulations might possibly act as buffers in the face of threat appraisals frequently leading to fear. Thus, rather than explicitly probing the target audience to regulate their emotions, indirect emotion regulation creates a subtle external intervention aimed to change core appraisal themes related to a certain emotion (see Figure 25.1).

An interesting demonstration of that process would be emotion regulation of hate. An indirect emotion regulation of hate would suggest first identifying its core appraisal—namely, that the outgroup is inherently and unchangeably evil (Halperin, 2008). It would then propose an intervention to counteract this appraisal such that future evaluations of compromise are met with lesser hatred and thus decreased resistance. To avoid reactance, such an intervention would need to be independent of the context of the specific intergroup conflict (Halperin et al., 2011). By introducing an established manipulation to increase people's belief that groups generally do change (Halperin et al., 2011), we were able to reduce hate across a variety of conflicts, and accordingly increase support for compromise.

Similarly, when targeting indirect emotion regulation of guilt, researchers found that a self-affirmation intervention (Sherman & Cohen, 2006) would increase willingness to

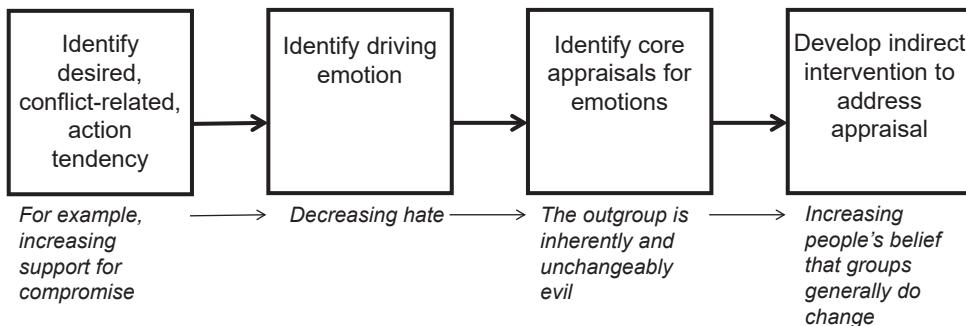


FIGURE 25.1. Indirect emotion regulation in intractable conflicts.

acknowledge ingroup responsibility for wrongdoing, and correspondingly support reparations (Čehajić et al., 2011). The indirect path to emotion regulation holds particular promise to intergroup conflict resolution, since it bypasses both potential defensiveness and reactance, as well as the lack of desire required for direct or communicative emotion regulation by changing targeted cognitive appraisals outside the context of a conflict.

Conclusions and Future Directions

Emotions play a crucial role in conflict, with some emotions tending to increase conflict (e.g., anger or hate), and other emotions tending to decrease conflict (e.g., empathy or hope). Thus, the rapid advancements in the field of emotion regulation enrich our understanding of conflict processes and provide us with better tools to cope with this critical social challenge. However, while intergroup emotion regulation interventions could have beneficial effects on intergroup conflicts, they are challenging to implement successfully. The fundamental issue with these interventions is motivation, as discussed previously. Hence, future studies should consider how all three approaches—namely, motivational, direct, and indirect—could be combined. Such integrated interventions must encompass the most effective strategy, the correct direction, and the specific messages that speak to the core appraisals of the relevant emotion in order to be successful.

Another challenge in implementing emotion regulation interventions in the context of violent conflicts results from the nature of the emotional processes that dominate these conflicts—namely, intergroup or collective emotions. Such emotions emerge from emotional dynamics among individuals who are part of a joint identity group and respond to the same situation (Goldenberg et al., 2020). When people interact with one another while sharing an emotional experience, their emotional responses can change in various ways, and as a result, it significantly affects how these emotions can be regulated. Much more research is required in order for us to gain a deeper understanding regarding the ways in which emotion regulation can be implemented in large groups and on a broad scale, and more importantly, regarding the distinction between regulating emotions of a group on the one hand, versus regulating the emotions of many individuals.

Finally, we should acknowledge the fact that the use of emotion regulation strategies can also create a barrier to social change. In the context of political adversary, individuals who used reappraisal more successfully tended to engage less in political action (Ford et

al., 2019). This phenomenon was also found among other emotion regulation strategies. For example, four studies conducted in Turkey, Israel, and the United States indicated that expressive suppression may undermine, rather than facilitate, efforts to engage in collective action even among people who are low in system justification (Solak et al., 2021). This means that in some intergroup contexts, emotion regulation intervention may ultimately be counterproductive when the goal is promoting social change toward more equality. More work is required to understand the way emotion regulation can promote social change through collective action, rather than focus exclusively on the reduction of negative group-level emotions in order to promote more harmonious relations. Given the complex nature and dynamics of emotions, emotional change can and should contribute to change through various means.

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CHAPTER 26

Institutional Emotion Regulation as a Support for Upward Socioeconomic Mobility

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People's lives vary dramatically according to the socioeconomic resources available to them and their communities. These financial and structural differences in life circumstances have implications for individuals' proximal emotional functioning, and long-term health and well-being (Cundiff et al., 2019; Hittner et al., 2019; Hittner & Haase, 2021; Kraus et al., 2012; Troy et al., 2017). Importantly, socioeconomic status (SES) is malleable, and many people move from one SES to another throughout their lifespan (see Destin & Debrosse, 2017). One dominant path toward upward socioeconomic mobility starts with a young person from a modest socioeconomic background attaining high academic achievement in their school years. Next, they might attend and succeed at an esteemed college or university, which eventually opens opportunities toward stable and fulfilling career trajectories. This seemingly straightforward path contains an abundance of potential barriers that present challenges, as well as opportunities for individuals' emotion regulation. A range of experiences within higher education illustrate the challenges of socioeconomic mobility and the central role of institutional actors.

Institutional Emotion Regulation

Early accounts defined emotion regulation as "the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998, p. 275). Subsequent work broadened this to focus on emotion regulation in interpersonal, group-based, collective, cultural, and other

contexts (e.g., Ford et al., 2022; Goldenberg et al., 2020; Meier et al., this volume; Porat et al., 2020). Building from this base, institutional emotion regulation captures the processes by which institutional actors implicitly or explicitly seek to regulate their own and others' emotions in the pursuit of complex and often conflicting institutional goals. As demonstrated in organizational research, institutional actors include influential forces at various levels that express and facilitate the values, interests, and objectives of a unit or organization (see Hwang & Colyvas, 2020).

This chapter focuses specifically on how institutional actors in higher education (e.g., administrators, faculty, staff) regulate their own emotions and the emotions of students from lower SES backgrounds in pursuit of institutional goals toward increasing socioeconomic diversity amid institutional practices that preserve inequity (see Lewis, 2022). Despite the focus on institutional emotion regulation as relevant to upward socio-economic mobility through higher education in the United States, the perspective aims to generate ideas that can apply to a diversity of other contexts and experiences as well.

Institutional Emotion Regulation within Higher Education

As many traditional 4-year colleges and universities in the United States strive to expand the socioeconomic diversity of their student populations, they increase the number of students who are likely to navigate higher education as a route toward upward socioeconomic mobility. These institutions confront key choices as they encounter the reality of a student body with increasingly diverse backgrounds and life experiences. The existing conditions for traditional colleges and universities tend to present a variety of inequitable challenges that can impair well-being, health, and learning for students from lower SES backgrounds. For example, social psychological research demonstrates that the cultural norms of postsecondary institutions tend to align with the orientation of students from higher SES rather than lower SES backgrounds (see Stephens, Markus, et al., 2014). Further, traditional colleges and universities often create physical and social separation between students and their home communities that is especially pronounced and consequential for college students from lower SES backgrounds (Covarrubias & Fryberg, 2015). Students from lower SES backgrounds become more likely than students from higher SES backgrounds to feel status uncertainty within college settings, which is a sense of instability about who they are and where they fall on the status hierarchy (Destin et al., 2017). Institutional emotion regulation builds from the process model of emotion regulation (Gross, 1998, 2015) to reveal how institutional actors shape these experiences and cope with the emotional ramifications for themselves and for students.¹

Institutional actors start by determining the parameters of the *situation*. Through situation selection and modification (e.g., admission processes, financial aid offerings, health and leave policies, syllabus policies), institutional actors play a profound role in shaping their own and others' emotions in the pursuit of institutional socioeconomic diversity goals. Some institutional actors, for example, may request perfect course attendance and deadline adherence, while others may allow for more flexibility to take into account students' lives outside the classroom. By adopting rigid policies, institutional actors may seek to keep negative emotions at bay, such as confusion or frustration, that may come from grappling with flexibility requests.

¹An institutional goal to increase socioeconomic diversity may in itself serve a variety of higher-order goals, including emotion regulation goals, as institutional actors may reap emotional benefits when their actions align with widely held beliefs in equality and meritocracy (cf. Jost, 2019).

As institutional actors engage with students from a wider range of socioeconomic backgrounds, they then decide the level of *attention* they devote to the experiences of students from lower SES backgrounds. Some institutional actors, for example, may adopt an approach that ignores SES to avoid ableist language, while others may shift their attention to acknowledge the ways that existing policies and practices privilege students from higher SES backgrounds and disadvantage those from lower SES backgrounds. By adopting a strategy that ignores SES, institutional actors may attempt to shield themselves from experiencing negative emotions, such as guilt or anger, as they maintain established operational practices.

Further, institutional actors form an *appraisal* of their students' disparate experiences. Some institutional actors, for example, may decide that students from lower SES backgrounds have negative experiences due to their own personal failings, while others may determine that structural inequities play a role in shaping these experiences. By attributing negative experiences primarily to students' personal failings, institutional actors may nurture feelings of pity and condescension toward them. They may also be less inclined to change policies and practices to meet student needs and leverage student strengths and, instead, may develop compensatory educational programs misguidedly aimed at remediating presumed student deficits (see Bensimon, 2005).

These processes related to the situation, attention, and appraisal are dynamic, cyclical, and nonlinear. An examination of subcontexts within institutions illustrates how institutional emotion regulation processes unfold, their consequences for student experiences, and evidence for approaches to better support students through the challenges of upward socioeconomic mobility.

Institutional Emotion Regulation within Higher-Education Subcontexts

Classrooms

In many ways, college instructors and faculty are institutional agents with the most regular and direct interactions with students (see Turetsky et al., 2021). College-level instructors make many decisions shaping the experiences of students from lower SES backgrounds, which are guided by regulation of their own emotions and can thus be analyzed through the lens of institutional emotion regulation. First, some faculty choices influence the situation by explicitly or implicitly encouraging or discouraging students from particular groups to enroll in their courses. Several areas of social psychological research suggest the types of messages from faculty about their courses that are likely to attract students from a diverse range of socioeconomic backgrounds. Specifically, experiments demonstrate that students across developmental periods become more motivated to engage when efforts are made to present topics in ways that connect with their genuine interests (see Harackiewicz & Hulleman, 2010). Also, experiments demonstrate that students who face stigma are better able to thrive around people and settings that acknowledge their identities rather than minimize their existence (Hollien & Shelton, 2012). College faculty often have the capacity to determine how their courses are described, how the content is presented, and what qualifies as valid scholarship. The evidence suggests that these course descriptions and broader frames that faculty use to introduce students to the course are likely to attract different types of students. For example, an instructor may signal that the course topics acknowledge social inequalities or have connections to important social issues affecting real communities. Even though such topics may evoke shame among instructors or privileged students, these types of messages are more likely to invite students from lower SES and other marginalized backgrounds. On the other

hand, signals that a course ignores social issues and students' sociodemographic positions are more likely to alienate lower SES students in ways that can limit their interest and achievement.

For faculty that do engage in situation selection practices that lead to socioeconomic diversity within their classrooms, there are also processes related to attention that shape student experiences. From their opening lectures to the final exam, college educators articulate to students whether they really *see* them and their backgrounds and further the inherent value derived from student backgrounds that are often seen as marginalized. A series of experiments have shown the effects of educators who deploy their attention toward the experiences and strengths of students from lower SES backgrounds (Silverman et al., 2023). College students were randomly assigned to encounter a faculty lecture that either specifically acknowledged the value of perspectives from students whose backgrounds are often marginalized or a lecture that was equally warm but did not attend to the strengths of students' backgrounds. Lower SES students who encountered messages from faculty recognizing their backgrounds and strengths showed a variety of positive effects on how they viewed themselves and engaged with the course. Educators can infuse their courses with effective content and messages that convey genuine attention and value to otherwise marginalized perspectives when their actions are not guided by fear and a motivation to avoid discomfort.

In addition to situation selection and attentional deployment, educators' appraisal processes also emerge as they engage with students from diverse backgrounds. Appraisals become especially apparent in investigating the types of assessments that college instructors and faculty use in their learning environments. How educators use assessments like assignments and exams reflect how an instructor makes sense of a student's potential and performance in the classroom and beyond. One relevant area of work distinguishes between assessments that emphasize ranking and those that emphasize learning. Assessments designed around ranking tend to sort students by presumed ability, making them more likely to elicit biases based on students' backgrounds. In several experiments, when instructed to rank for the strongest students, evaluators give worse grades to lower SES students than to higher SES students with the same test responses (Autin et al., 2019). These studies demonstrate the latitude that instructors hold in how they view, evaluate, and explain student achievement. For many, a process of cognitive change is necessary to move away from pity and condescension to acknowledge how specific teaching practices are rooted in biased appraisals that reproduce inequalities.

Institutional Climate

Beyond the individual classrooms of faculty members, the practices and policies of a college or university contribute to its institutional climate. Throughout this broader layer of context, there are many ways that the moves of institutional actors map onto an institutional emotion regulation model to shape the experiences and emotions of students. Admissions and financial aid policies play an enormous role in establishing the *situation* of socioeconomic diversity or homogeny at an institution. As such, increasing the recruitment of students from lower SES backgrounds has become a dominant form of situation modification. Financial aid packages are among the strongest student recruitment tools. The economic resources that are made available to students have a significant effect on their college experience and achievement. One set of studies demonstrated how the financial burden of paying for college negatively affects students. When students were randomly assigned to bring to mind the high costs of college in ways that interfered

with their future goals, they experienced worse cognitive functioning than other students (Destin & Svoboda, 2018). These financial circumstances force students to negotiate feelings of gratitude and hope amid conflicting feelings of worry and distress.

Beyond policies and practices related to admissions, the ongoing institutional climate can be one that acknowledges and devotes *attention* to the needs of students across socioeconomic backgrounds, or it can reinforce a norm of student wealth. One series of studies experimentally manipulated whether the institutional climate was warm and attentive toward lower SES students or chilly and dismissive of their existence (Browman & Destin, 2016). In the warm climate condition, students encountered materials emphasizing that the university was proud to devote financial resources to support the inclusion and success of students from lower SES backgrounds. In the chilly climate condition, materials instead emphasized the wealth of the student body. Compared to the chilly climate prompts, the warm climate prompts where institutions deploy greater attention to lower SES students led those students to feel better situated to succeed academically and to internalize the view of themselves as high-achieving students. Meaningful indicators that an institution attends to the needs of otherwise marginalized students may be that these students experience interest, joy, pride, hope, and even love rather than predominantly fear, disappointment, and frustration.

For many students from marginalized backgrounds, their interactions with peers and their distance from valued communities present additional barriers to positive affective experiences, such as feelings of security and belonging. Institutions make their own *appraisals* in deciding their level of responsibility for these critical aspects of the student experience. A variety of studies demonstrate practices that can help to facilitate experiences that are connected to positive affect and emotions for students when institutions accept their role in cultivating the environment. For example, experimental efforts to cultivate a sense of belonging among students can have pronounced effects on the achievement, retention, and life trajectory of students from minoritized communities (Brady et al., 2020; Murphy et al., 2020; Walton & Cohen, 2011). Additionally, providing opportunities for peers to convey to students that their diverse socioeconomic backgrounds are valued contributors to success has positive effects on the achievement of students from lower SES backgrounds (Stephens, Hamedani, et al., 2014; Townsend et al., 2021). Finally, a variety of institutional practices can help students to maintain connections to valued communities, which can be especially consequential for students from socially and economically marginalized backgrounds (Covarrubias, 2021; Destin et al., 2021). All of these approaches require a cognitive change for institutions to shift away from existing appraisals that assume students should navigate feelings of precarity in social circumstances that were designed without consideration for their backgrounds and perspectives.

Conclusion

A better understanding and recognition of the emotion regulation processes of institutional actors that shape the experiences of students from marginalized backgrounds opens new opportunities for multiple areas of research in addition to educational practice. For example, studies can use innovative methods to directly investigate, reveal, and address sources and consequences of institutional emotion regulation that may guide the development of a wide variety of specific institutional practices and policies. This introduction of institutional emotion regulation focuses on the unique identity challenges associated with socioeconomic mobility and students' shifting socioeconomic circumstances. These

processes intersect, however, with racialized, gendered, and other experiences connected to social positions in ways that can be captured by this attention to institutional values and practices. Continuing to build from a foundation that connects powerful structures to the well-being of individuals will illuminate effective approaches to leverage a rich emotional landscape to reduce rather than contribute to inequality.

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CHAPTER 27

Culture and Emotion Regulation

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Emotions in this chapter are viewed from the perspective of what they do in our relationships: making sense of events in those relationships, and taking a stance accordingly. For example, many instances of anger involve a position of nonacceptance (*stance*) upon the observation that one is treated unjustly by another person (*making sense*). Many instances of pride entail a claim on respect and good treatment by others (*stance*)—for example, because one deserves it or deserves it more than others (*making sense*). Emotions, conceived as relationship acts, are at the foundation of our interactions and relationships.

There is increasing evidence that cultural differences in the most desirable and the most prevalent types of emotions (i.e., relationship acts) can be understood from the interactions and relationships that are valued in each culture (e.g., Boiger & Mesquita, 2012; Kitayama et al., 2006). For example, relationship acts that underline entitlement (instances of anger, pride) are both more appropriate and prevalent in cultures that value autonomy in relationships. In these cultures, emotional episodes that compromise an individual's autonomy are deemed inappropriate and tend to be avoided. Many instances of shame fall in this latter category, as they involve (expressions of) a willingness to conform to social norms and expectations (together with the awareness that one has been in violation of those norms and expectations). In this chapter, we first provide evidence supporting systematic cultural differences in the descriptive emotion norms.

We then discuss the processes at work in emotion regulation, here broadly conceived as “all processes that influence which emotions we have, when we have them, and how” (Gross et al., 2011, p. 767). We suggest that emotions are fashioned or regulated to match the valued interactions and relationships in the respective culture. Emotion regulation happens at three different levels: the individual, relational, and collective levels. At the individual level, emotion regulation is guided by concerns and values that have been internalized through frequent encounters with the sociocultural environment. At the relational level, emotion regulation is ushered by one’s interactions and relationships with others; people negotiate cultural values, goals, and beliefs together (i.e., with their

children or partner), and in so doing, afford culturally valued emotions. Finally, at the collective level, emotion regulation is an effect of how the sociocultural environment is organized (i.e., in terms of institutions, practices, and products). For the sake of clarity, we discuss processes of cultural emotion regulation at each level separately, although these levels are often interrelated.

One conclusion from the extant (but scarce) research is that emotion regulation is not shouldered by an individual alone but often undertaken by collectives and in relationships. Even if the individual does not actively modify their emotions, social and collective regulation influence what emotions individuals have, when they have them, and how. To the extent regulation is social and collective, the distinction between emotion regulation and emotion generation is moot. Our proximal and distant cultural environments help tailor our emotions to the culturally valued ways of relating to others.

The “Right” Emotions Differ across Cultures

Across cultures, the most prevalent types of emotions differ, and so do the emotions that predict the best outcomes in different cultures. Prevalent emotions tend to foster, and rare emotions tend to interfere with, the culturally valued interactions and relationships (e.g., Mesquita, 2003; Mesquita et al., 2016). For example, Kitayama and colleagues (2006) found that European American participants reported more *socially disengaging emotions*, such as anger and pride, and that Japanese participants reported more *socially engaging emotions*, such as closeness, indebtedness, and shame. The dimension of social engagement was empirically derived to describe the emotion domain in both the United States and Japan (Kitayama et al., 2000). Emotions at the disengaging end of the dimension can be thought of as conducive to independent relationships, as they separate the self from others and highlight autonomy; emotions at the engaging end can be thought of as conducive to interdependent relationships, as they promote relatedness. Well-being in U.S. participants was associated primarily with disengaging emotions, and in Japanese participants primarily with engaging emotions (Kitayama et al., 2000).

In research tracking emotions “online” during an actual interaction, we also found cultural differences in the prevalent emotions. Here, too, the culturally prevalent emotions fit the valued relationship models. In a recent study, we invited Belgian and Japanese couples to a lab in their respective countries, and asked them to discuss a topic of disagreement (Boiger et al., 2022; Kirchner-Häusler et al., 2022). The emotional states couples frequently returned to over the course of the conflict interaction (so-called attractor states, derived from self-reported emotion ratings) differed across cultures. Belgian couples returned to mutual states of *anger/hostility*, while Japanese couple interactions gravitated toward mutual states of *positive socially engaging emotions* (e.g., *empathy*; Boiger et al., 2022). These couple attractor states matched the relationship goals described for Western versus Japanese contexts: relational autonomy and independence versus harmony and mutual adjustment, respectively (Markus & Kitayama, 2010; Morling et al., 2002; Rothbaum et al., 2000).

The same couple interaction study yielded evidence for systemic cultural differences in the preponderance of positive versus negative affect (Kirchner-Häusler et al., 2022). Based on continuous valence ratings, we calculated the positive-to-negative ratios of each couple during the disagreement interaction. Belgian couples had a higher positive-to-negative ratio than Japanese couples. The difference is consistent with the emphasis on mutual enhancement as a relationship goal in Western (U.S.) cultures (e.g., Kitayama et

al., 2000) and on harmony and mutual adjustment in Japanese relationships (Rothbaum et al., 2000; Markus & Kitayama et al., 2010; Morling et al., 2002). In fact, the relatively lower prevalence of positive affect fits other research (e.g., Uchida & Kitayama, 2009), which suggests that positive emotions may be seen as disruptive in Japanese relationships, as they hamper sensitivity for the other's needs (unlike some negative emotions, such as shame). Positive-to-negative ratios in the couple interactions were positively associated with relationship satisfaction. In both cultures, satisfied couples were more likely to avoid negative affect than less satisfied couples, yet only Belgian satisfied couples reported high levels of positive affect.

Processes of Emotion Regulation

Cultural differences in emotions are not random, nor are the culturally different ways in which emotions contribute to well-being. Instead, these differences appear to be systematic in that they can be understood from the prevalent relationship goals in each culture. This is reason to assume that emotion regulation is at play. In what follows, we aim to shed light on the regulatory processes that align emotions to the respective cultural relationship goals.

Individual-Level Emotion Regulation

Appraisal

The appraisal of the situation is one individual-level process to align emotions with valued relationship goals in a situation. For instance, Boiger and colleagues (2018) found that a wide range of anger and shame vignettes, developed to be relevant across cultures, were differently appraised by Japanese, Belgian, and American college students. Differences in appraisal could be understood from the valued relationship goals. For anger situations, for instance, Japanese participants reported more blame in response to vignettes with distant than with close others as protagonists—suggesting they refrained from blaming close others. This would be consistent with the Japanese concern with protecting close relationships. In contrast, American and Belgian participants, concerned with protecting individual autonomy in close relationships, were more likely to report other-blame in response to vignettes in which close others failed to meet relational norms. In this study, similar situations were appraised differently across cultures in ways that constituted a different emotional experience.

Some other research suggests that the relationship goals at stake in a situation—those that informed the appraisal—predicted the types of emotions reported in a situation. In survey research, Belgian and Turkish respondents reported more socially disengaging (anger, pride) than engaging (embarrassment, closeness) emotions when self-focused goals were at stake in the situation (e.g., personal success, being ambitious); they reported more engaging than disengaging emotions when other-focused concerns were at stake (e.g., being loyal, helping others; De Leersnyder et al., 2018).

Response Modulation

Another individual-level process of emotion regulation is response modulation: the extent to which (certain) emotions are displayed. Again, the combined evidence suggests that

response modulation serves culturally valued relationship goals. Most evidence is indirect, examining the extent to which participants in different cultures think they *should* modulate the display of emotions. For instance, Matsumoto et al. (2008; see Moran et al., 2013, for similar findings) asked students from a variety of cultures to indicate to what extent they displayed each of seven emotions (anger, contempt, disgust, fear, happiness, sadness, and surprise); the scale included anchors such as “showing what you feel” and “showing nothing.” In individualistic cultures, “showing what you feel” was considered important; in collectivistic cultures, “showing less than you feel” or “showing nothing” were more important (Matsumoto et al., 2008).

Cultural differences in the norms for response modulation seemed to be more pronounced for some emotions than for others: the association between individualism and “showing what you feel” in Matsumoto et al.’s (2008) study was primarily carried by high-arousal positive emotions (happiness and surprise) that are less valued in East Asian than in U.S. cultural contexts (Tsai et al., 2006). Comparing a Japanese and a Canadian sample, Safdar et al. (2009) found cultural differences in the norms for response modulation of “powerful” (e.g., anger, contempt), but not of “powerless” (e.g., sadness, fear) emotions. The researchers suggest that powerful (not powerless) emotions threaten harmony and adjustment, and for this reason are suppressed more by Japanese.

In our recent cross-cultural couple study, we went beyond studying the norms for response modulation to study self-reported response modulation in Japanese and Belgian couples that engaged in a conflict discussion (Schouten et al., 2020). We replicated earlier findings that suppression is more common in Japanese than Belgian contexts—however, cultural differences in suppression were more pronounced for socially disengaging (e.g., anger) than for socially engaging (e.g., embarrassment) emotions.

Relational Emotion Regulation

From early on, other people help us to align our emotions to the culturally valued relationship goals; across cultures they do so in very different ways (Mesquita, 2022). For example, Cole et al. (2006) observed how caregivers in two Nepali ethnic groups with similar demographic characteristics, the Tamang and the Brahman, regulated their children’s anger and shame differently. Tamang caregivers (Tibetan Buddhists) ignored and rebuked their child’s anger, possibly because it would interfere with their social goals of egalitarianism, compassion, and social harmony. In contrast, Brahman caregivers positively attended to the child’s anger through nurturing and reasoning; anger is compatible with the value placed on vigilance, ethnic pride, and dominance in this high caste with privileged status. The opposite pattern emerged for shame: Tamang caregivers responded to most instances of shame with teaching and nurturing, as shame promotes modesty and humility, and implies a concern for others’ evaluations about the self. Brahman caregivers, wanting their children to be assertive, mostly ignored shame instances in their children.

Even in adulthood, partners mutually influence each other’s emotions toward an equilibrium (Butler, 2011; Parkinson et al., 2016)—however, research on the ways other people later in life help us to align our emotions with the culturally valued relationship goals is scarce. One cross-cultural daily diary study among couples of eight different countries (Schoebi et al., 2010) yielded cultural differences in the emotional connection between one partner’s self-reported anger, and the other partner’s self-reported emotions on the next day. In collectivist cultures (e.g., China), husbands were more likely to respond to their wife’s anger with sadness/depressed mood than in individualistic cultures (e.g.,

Germany). The husband's sadness/depressed mood may have helped to restore relational harmony, as it signaled a need for compassion on the part of the wife, possibly attenuating the wife's anger subsequently (the researchers did not confirm that this was the case). The finding suggests that partners' emotions may mutually constrain or afford each other in ways that serve the culturally valued relationship goals.

Collective Emotion Regulation

Cultural emotion regulation also happens at the collective level. Cultural products, such as books, highlight cultural emotion norms by displaying the emotions that are conducive to culturally valued relationship goals (Boiger, De Deyne, et al., 2013; Ding et al., 2021; Sanders et al., 2018). For example, the books that Russian parents had read to their children contained more words referring to anger and sadness, and more illustrations of anger and fear than the books U.S. parents had read (Chentsova-Dutton et al., 2021). Cultural differences in the books' display of negative emotions reflected the differential degree to which Russian and U.S. parents attached value to negative emotions. Hence, cultural products—such as books—highlight emotion norms, thus affording emotions that are consistent with the cultural values.

Cultural regulation may also occur as situational affordances. Boiger and colleagues (Boiger, De Deyne, et al., 2013; Boiger, Mesquita, et al., 2013; Boiger et al., 2014) tested the idea that the ecology of everyday interactions promotes culturally valued, and suppresses culturally devalued, emotions. In one study (Boiger, Mesquita, et al., 2013), college students from the United States and Japan read about interactions that, in previous research, were reported to elicit either shame or anger by respondents from the same cultures. For each vignette, participants rated the frequency of this type of situation in their culture, and the intensity of the elicited emotion if the situation were to occur. U.S. participants reported a high frequency, whereas Japanese participants reported a low frequency, of those anger situations that were most anger provoking. The opposite was found for shame. One way to understand these findings is that the most common types of social interactions in a given culture align individuals' emotions to the culturally valued relationship goals. For instance, the assertiveness found in many U.S. contexts promotes anger; the elaborate politeness rules shaping Japanese interactions steer away from anger, thus promoting relational harmony.

In subsequent studies, including Japanese and Turkish (Boiger et al., 2014), and U.S. and Belgian (Boiger, De Deyne, et al., 2013) samples, we replicated this general principle. Whereas the specific emotions of anger and shame were valued to culturally different degrees, social interactions geared toward the culturally valued emotions were in all cultures frequently encountered, and social interactions known to elicit devalued emotions were cross-culturally avoided. In sum, the ways we habitually interact with one another—the commonly encountered interactions—help to align individuals' emotions to the culturally valued relationship goals.

Conclusion

Cultural differences in prevalent emotions can be understood as the outcomes of emotion regulation. The processes of emotion regulation that underly these different outcomes are documented less well. Research suggests that individual appraisals and response modulation align emotions to culturally valued relationship goals—however, cultural emotion

regulation also takes place at the relational and collective levels. Starting with caregivers early on in life, significant others' responses shape our emotions in ways that converge with the cultural relationship goals: they afford and promote culturally valued and discourage and avoid culturally devalued emotions. At the collective level, cultural products (i.e., books) and habitual interpersonal encounters afford valued and constrain devalued emotions. Individual tendencies, relationships, and cultural practices co-constitute our emotional experiences and expressions such that they match the prevalent cultural values, goals, and beliefs.

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SECTION VII

**INDIVIDUAL
DIFFERENCES**

CHAPTER 28

Emotion Regulation through the Lens of Emotional Intelligence

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In 1990, emotion scientists Salovey and Mayer proposed that some individuals possess a greater ability than others to reason with emotions in order to enhance both cognitive and social functioning. They defined emotional intelligence (EI) as “the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them, and to use this information to guide one’s thinking and actions” (p. 189). In 1995, EI was popularized by Goleman’s (1995) book *Emotional Intelligence: Why It Can Matter More Than IQ*. Goleman’s definition of EI included a broad array of traits and dispositions, such as self-confidence, motivation, and optimism, that had been shown to contribute to work performance, well-being, and overall success in life.

In subsequent years, the field became replete with many definitions, measures, theories, and models of EI—however, interpretations often conflicted and engendered confusion and controversy about the construct and its predictive validity (Brackett & Mayer, 2003; Daus & Ashkanasy, 2003; Zeidner et al., 2004). In 1997, Mayer and Salovey refined their model of EI to include four distinct abilities: perceiving emotions, using emotions to facilitate thought and language, understanding emotions, and managing emotions in oneself and others.

Brackett (2019) built upon Mayer and Salovey’s (1997) model to further refine the skills (e.g., distinguishing emotion perception and emotion expression) identified by the acronym RULER. The first skill is *Recognizing emotion*: noticing a shift in one’s thoughts, energy, or body, or in someone else’s facial expression, body language, or voice as an initial clue that something important is happening. The second skill is *Understanding emotion*: knowing the causes of emotions and how they influence our thoughts and decisions. This begins to point to a regulation strategy—for example, knowing that frustration can be caused by a blocked goal can inform a helpful response. The third skill is *Labeling emotions*: finding the precise term(s) for an emotional experience. Skillful

differentiation of emotion words (e.g., *anxiety* vs. *stress* vs. *overwhelm*) helps us to communicate clearly and choose relevant regulation strategies. The fourth skill is *Expressing emotions*: discerning how and when to best display or share our emotions, depending on the social and cultural contexts. The fifth skill is *Regulating emotions*: monitoring and modifying emotional responses in helpful ways in order to reach personal and professional goals. Emotion regulation (ER) requires an acceptance and skillful management of *all* emotions. According to EI theory, the first three skills help us to accurately identify and decode what we and others are feeling. The last two skills, help us to use our emotions wisely to achieve desired outcomes.

ER from an Emotionally Intelligent Perspective

ER is the most crucial of the five RULER skills. We need it to function to varying degrees every moment of our waking life. Yet many of us default to an ad hoc, automatic approach (e.g., numbing feelings, pursuing unhealthy habits), or we rely on external social controls (e.g., conforming to convention, deferring to others' influence). Few of us received a formal education on how to intentionally use ER strategies to facilitate desired outcomes.

ER is also the most challenging of the five skills. Gross (1998, p. 275) defines it as “the process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions.” EI theory specifically emphasizes and codifies two goals. The first goal is to modify an emotional experience, for example, to up- or down-regulate one or more emotions. The second goal is to select one or more regulation strategies to achieve a more distal outcome, such as making a sound decision, building and maintaining a positive relationship, performing an important task, or striving for well-being (Brackett, 2019).

In the field of EI, healthy ER has several qualities. It begins with the belief that emotions matter to all human endeavors (Ford & Gross, 2019). Additionally, all emotions, pleasant and unpleasant, are valued for the information they can provide in specific situations. Precise labeling and accurate understanding increases the accuracy of emotion communication and regulation. A growth mindset supports persistent learning since it can take several attempts—lifelong in some cases—to achieve a regulation goal. One’s repertoire of strategies evolves with development, circumstances, and challenges, and benefits from frequent reevaluation and improvement. Discernment is required to discover and select the best short- or long-term strategies that minimize undesirable emotions (down-regulation), increase desirable emotions (up-regulation), or maintain wanted emotions.

Misconceptions about Emotionally Intelligent ER

In our work implementing RULER, an evidence-based approach to social and emotional learning (www.rulerapproach.org), into thousands of schools nationwide and abroad, we have encountered numerous misconceptions about ER in need of clarification.

First, ER is not about denying our own or others’ emotions; quite the opposite, it affirms a “permission to feel” attitude about all emotions and our choices we make about what we do with them. Similarly, ER does not minimize the difficulty of actual life events that cause unpleasant emotions, such as poverty, discrimination, or COVID-19. Rather, in situations where rearranging circumstances is not possible, ER can offer some

self-protection, control, or an alteration of how an event is experienced in oneself and inside our close relationships.

ER is not a ruse for the social control of others. It's important that individual goals for regulation be validated, and that the strategies draw upon unique identities, strengths, values, and cultural backgrounds. Coregulators (people who help others regulate their emotions) in positions of power have an added responsibility to be sensitive and skillful, and to monitor their motivations.

ER is not singularly focused on happiness, but rather the ability to increase or decrease a full range of emotions depending on the situation and goal. All emotions, including unpleasant ones, are informative (Parrot, 2002)—for example, grief can help one process a loss. There is no external criterion of correctness of a strategy (other than to exclude those that cause physical or emotional harm to oneself or others). Some strategies that work in the short term (e.g., a nap) are counterproductive in the long term (e.g., oversleeping). Some strategies can be helpful in moderation but can lead to lower well-being when overused (e.g., social media). Strategies that work for one person may not work for another person. The goal of ER is to cultivate a wide range of strategies and evaluate them for their helpfulness in achieving personal and professional goals. ER skills are not “fixed” but rather are continuously co-constructed, learned, replaced, and refined throughout development.

Finally, ER is not the same as temperament or personality. A person who seems calm or to possess high self-esteem may still have difficulty regulating unpleasant emotions. Likewise, someone whose moods are more mercurial may be highly skilled at managing challenging emotions in order to function. Research shows that personality traits, such as the “Big Five,” correlate weakly with performance measures of ER (Brackett & Mayer, 2003). ER is also different from coping and resilience. Coping generally refers to how we respond to stress, whereas ER pertains to managing the full range of emotions. Resilience is a process of adapting in the presence of adversity, whereas ER is one contribution to that ability (Folkman & Moskowitz, 2000).

Steps to Emotionally Intelligent ER

The pedagogy of teaching the RULER skills of EI has been simplified over 2 decades to a sequence of parsimonious steps. However, it is critical that each step is considered in a person-by-context perspective (Bronfenbrenner & Morris, 2006), where the understanding of and meaning ascribed to emotions, emotion goals, and regulation strategies may vary by individual and setting. One size does not fit all.

Person variables include one’s biology, psychology, and developmental status. For example, humans as a species have emotion biases toward threat detection, as well as social connection and cohesion. Yet each individual’s stress regulation system is also uniquely sculpted in part by their genetics and epigenetics (Kundakovic & Champagne, 2015). It can also vary with their pattern of neurodiversity, and even their momentary biological state (Grillon et al., 2015). Psychological qualities like temperament (e.g., biological sensitivity; Boyce, 2019), personality, and psychological skill also vary by person. Developmental processes constrain and shape emotion salience, emotion goals, and ER: The stress and ER system takes 25–27 years to fully mature, and both the first 3 years of life and the onset of puberty are sensitive periods when coregulation with others has a strong influence on an individual’s stress regulation physiology (Gunnar & Howland, 2022).

Context variables provide larger “blueprints” for interpreting and managing emotions in different settings. Various circumstances have different “scripts” for the meaning and appropriateness of emotions. For example, strategies that work in one setting may not be effective or practical—even for the same emotion—in another setting. Different cultures value collective harmony over individual autonomy, so dissonant emotions may be unrecognized, misunderstood, or judged harshly. Gender norms powerfully constrain emotions and the selection of ER strategies (e.g., Nolen-Hoeksema & Aldao, 2011). Some settings allow strategies while others may not. A student who prefers to stand in class may need permission to do so. Resources of all kinds—personal, interpersonal, physical, institutional, or economic—can constrain the selection of strategies. It is important to understand the context to determine the fit between the individual experience and the setting; the greater the gap, the more discernment and emotion skill are required.

Step 1. Identify the Emotion(s): “What Am I Feeling?”

ER strategy selection is best informed when we recognize *what* we’re feeling before we decide *what to do* with our feeling. Often, we feel more than one emotion at a time (Scherer & Ceschi, 1997). We can feel moods and emotions simultaneously, and even experience feelings about our feelings (meta-emotions). The more nuanced a person is in describing their feelings, the easier it is to communicate those feelings and choose helpful ER strategies. Research shows that *emotion granularity* (making fine-grained distinctions between similar emotional states) and *emotion differentiation* (classifying experiences into discrete emotional categories) are associated with psychosocial adjustment (see Smidt & Suvak, 2015).

Lieberman and colleagues (2007) examined whether affective labeling would moderate distressing emotions. In one study, participants with arachnophobia were placed in a room with a caged spider. Initially, participants did not believe labeling their emotions would help. But those who used words such as *anxiety* or *fear* to describe their feelings were able to take more steps closer to the cage than participants who used emotion-neutral words to simply state the facts of the situation. Affective labeling is linked to lower activation of the amygdala, the brain region that is activated when we feel negative emotions, and higher activation in the right ventrolateral prefrontal cortex (rVLPFC) that supports ER (Lieberman et al., 2011).

In our teaching of ER throughout the COVID-19 pandemic, we asked thousands of people to define related but distinguishable emotions like anxiety, stress, pressure, and fear. A majority of the participants said there were no real differences. Yet there are striking differences in definition. Anxiety is related to perceived uncertainty; stress arises from having too many demands and not enough resources; pressure is the belief that something at stake is dependent on our behavior; and fear is connected to impending danger. With these finer distinctions, it becomes evident, for example, that an ER strategy that might work best for anxiety, such as deep breathing or positive self-talk, might not be as helpful for stress, which may require lessening demands or increasing support. Finding the right word(s) can help a person select more helpful strategies, more quickly.

Step 2. Determine the Goal: “What Do I Want to Do About This Emotion?”

This step in the regulation process begins with the question “What is my emotion goal?” or “How do I *want* to feel?” In RULER, we follow Gross’s (1998) process model and use the acronym PRIME to help individuals identify five possible emotion goals: *prevent*,

reduce, initiate, maintain, or enhance emotions—for example, “Do I want to feel less anxious or disappointed? Sit with my frustration? Remain content or optimistic?”

ER can be applied to different points in time. For example, we can attempt to prevent unwanted emotions from occurring in the future, sometimes referred to as anticipatory ER (e.g., prevent anxiety around an upcoming test). We can also reduce or deactivate overwhelming emotions in the moment (e.g., lessen fear resulting from an unexpected scare). We can enhance or prolong our experience of pleasant emotions—for example, by choosing to savor a joyful encounter. Or we can reframe a difficult past experience.

Step 3. Select a Strategy: “What Strategy Will Be Most Effective for This Emotion in This Context?”

Choosing an ER strategy is a complex calculation. Helpful strategies are individualized; one size doesn’t fit all, even for the same emotion, and we regularly employ multiple strategies, polyregulation, to regulate an emotion (Ford et al., 2019). The options for healthy ER strategies can be infinite (Parkinson & Totterdell, 1999). They may include strategies that regulate physiological arousal, such as mindful breathing; thoughts that analyze or reframe emotional experiences (e.g., positive reappraisal, temporal distancing, and prayer); engagement of others for social support; or the modification of one’s situation, which can include physical activity, sleep, and nutrition.

Research over the last few decades has found that individuals with deeper knowledge of healthy ER have greater well-being, more meaningful social relationships, and better job performance (Brackett et al., 2016).

Step 4. Evaluate the Strategy: “Did It Work? Was It Helpful?”

The final step requires reflecting on the implementation of the ER strategy: “Did my action help to achieve a personal or professional goal? If not, why was the strategy unsuccessful? Do I need more practice with the strategy, or do I need to replace it with a more helpful one?” In practice, we encourage people to become “emotion scientists” about their strategy selection: curious, open, investigative, and experimental about searching for, evaluating, and refining their own strategies, and helping others to refine theirs.

Conclusion

ER is the process of influencing our emotions in the directions of our goals, whether they are momentary or long term, proximal or distal. Our work embedding RULER in school ecologies throughout the world has shown that ER skills can be taught to adults and children, and that better regulation leads to more positive outcomes (Brackett et al., 2019). ER begins with prenatal influences on physiology, takes shape in the home, is learned in schools, and evolves across development. Because ER is inextricably linked to cognitive and social development, ER skills should be taught in a developmentally scaled fashion like most other curricula, with schools serving as learning hubs for caregivers, families, and the wider community.

In summary, ER strategies must be modeled, learned, encouraged, practiced, evaluated, and continually refined. More research is needed to unpack the best methods for teaching ER, the role of coregulation, and which specific strategies work best for whom across development and contexts.

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CHAPTER 29

Alexithymia

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The term *alexithymia* (from the Greek: *a* = lack, *lexis* = word, *thymos* = emotion) was first coined in the 1970s by American psychiatrists Sifneos and Nemiah to describe a cluster of emotion processing deficits they commonly observed in their patients with psychosomatic disorders (Sifneos, 1973). Following these pioneering observations, over five decades of research has since established alexithymia as a key transdiagnostic risk factor for a wide range of psychopathologies, with important implications for emotion regulation, well-being, and interpersonal functioning (Luminet et al., 2021).

It is generally agreed that alexithymia is characterized by at least three core facets: *difficulty identifying one's own feelings*; *difficulty describing one's own feelings*; and an *externally oriented thinking style*, whereby one tends to focus attention excessively on the external world rather than on one's internal feelings (Preece et al., 2017). Alexithymia is now well established as a dimensional trait that is normally distributed in the general population, with twin studies indicating that around 30–33% of the variance in alexithymia levels can be attributed to genetic, and the remainder to environmental, factors (Jørgensen et al., 2007).

In this chapter, we provide an overview of alexithymia. We first outline what we believe is a useful conceptual framework for understanding alexithymia: the *attention-appraisal model of alexithymia*. We then review some key alexithymia assessment tools, research on the clinical relevance and treatment of alexithymia, its importance for emotion regulation, and some key growth areas for the field.

The Attention–Appraisal Model of Alexithymia

The *attention–appraisal model of alexithymia* (Preece et al., 2017, 2020) is based within the framework of Gross's (2015) *extended process model of emotion regulation*. According to the latter, emotions are generated and regulated via *valuation systems* comprising four sequential stages (situation–attention–appraisal–response) through which people

evaluate stimuli in the world. An emotion is generated when an emotion-inducing stimulus or *situation* is present; one focuses *attention* on that situation; and if it is *appraised* as meaningful, then an emotional *response* may occur. That emotional response may then be regulated via a second-level valuation system, where the emotion itself now becomes the *situation* that is the focus of *attention*; the emotion is *appraised* in terms of what it is and what it means for one's goals; and based on that appraisal, a decision to regulate that emotion might be made at the *response* stage.

In the attention-appraisal model, people's level of alexithymia can be understood as their degree of difficulties at the attention and appraisal stages of the second-level valuation system (or any valuation system that is evaluating an emotion). That is, externally oriented thinking reflects difficulties in focusing attention on the emotion, whereas difficulty identifying feelings and difficulty describing feelings reflect difficulties in appraising what the emotion is and what it means (see Figure 29.1 for a visual representation of this model). Specifically, people with high alexithymia have difficulties processing emotions with a high degree of differentiation or nuance (i.e., they characteristically experience their emotions as a more undifferentiated state; e.g., they are unsure whether an unpleasant feeling is sadness, fear, or anger; Preece et al., 2018). Since emotion regulation decisions (i.e., at the response stage of the second-level valuation system) hinge on how the emotion is appraised, it follows that alexithymic difficulties in attending to and appraising the emotion hinder effective emotion regulation (Preece et al., 2022). Thus, alexithymia is an important consideration for the broader emotion regulation field.

Alexithymic difficulties at the attention and appraisal stages of emotion processing appear to be caused by a combination of two primary sources. One source is the *developmental level of people's emotion schemas* (also known as ability-deficit alexithymia)—that is, the cognitive structures that people use to process emotions (Preece et al., 2017). As noted by Lane and Schwartz (1987), large individual differences exist between people in how well developed their emotion schema systems are. If these systems are underdeveloped, a person's ability to process emotions at a nuanced level, even if they want to, is limited. Indeed, a variety of studies have found that high levels of alexithymia are associated with underdeveloped emotion schema systems (e.g., Vermeulen et al., 2006) and a distinct pattern of neurobiological correlates across limbic, motor, and cognitive control-related brain areas (see Xu et al., 2018, for a meta-analysis).

The second key source of variance is the extent to which people use *experiential avoidance of their emotions as an emotion regulation strategy* (also known as avoidance alexithymia; Preece et al., 2017). That is, to cope with distress, some people may select an emotion regulation strategy where they avoid focusing their attention on and appraising their emotions (e.g., Panayiotou et al., 2015). If selected, this means that in subsequent valuation systems evaluating an emotion, alexithymic individuals are likely to have even greater difficulties processing their emotions accurately.

Taken together, one's overall level of alexithymia (i.e., difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking) is therefore determined by the combination of the individual's degree of emotional processing ability deficits and their avoidance of emotions. Indeed, this is in line with the current body of longitudinal findings demonstrating that people's levels of alexithymia are relatively stable over time (i.e., likely reflecting the developmental level of emotion schemas), but can still fluctuate meaningfully, with elevations common during periods of distress (i.e., increased avoidance alexithymia as an emotion regulation response; e.g., Luminet et al., 2001; see Luminet et al. 2021, for a more detailed integrative review of the evidence supporting the attention-appraisal model and the nature of cognitive-emotional processing in alexithymia).

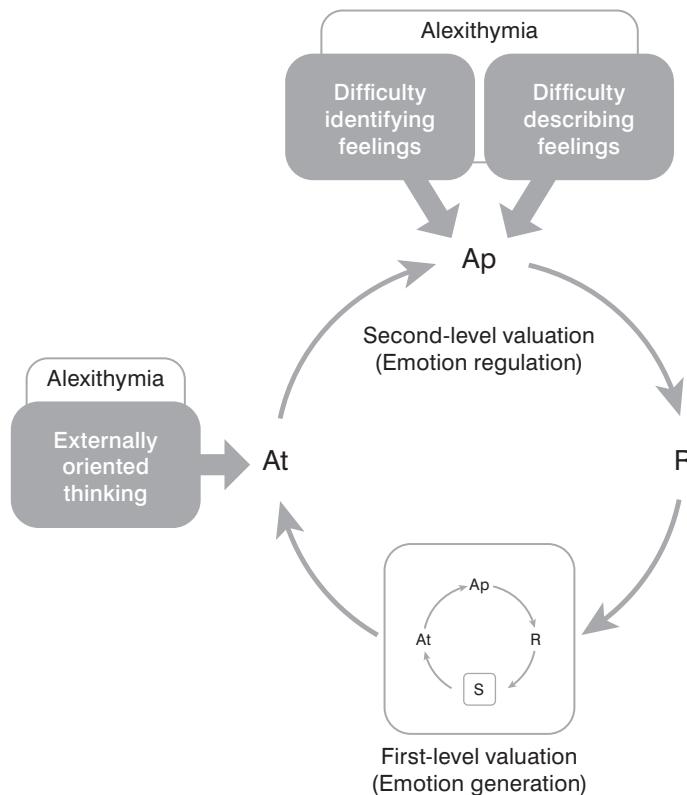


FIGURE 29.1. The attention-appraisal model of alexithymia. As noted in the extended process model of emotion regulation (Gross, 2015), all valuation systems consist of four sequential stages through which stimuli are evaluated: *situation* (S), *attention* (At), *appraisal* (Ap), and *response* (R) stages. At the first-level valuation system (emotion generation), an emotion is generated when an emotion-inducing stimulus is present at the situation stage (e.g., a snake is in the room), one focuses attention on it (e.g., noticing the snake), appraises whether it is meaningful for their goals (e.g., appraising that the stimulus is a dangerous snake and bad for one's goal of staying alive), and if so, an emotional response may occur (e.g., fear). This emotion can then become the target (situation) of the second-level valuation system (emotion regulation). The generated emotion becomes the focus of attention, is appraised in terms of what kind of an emotion it is and what it means for one's goals, and based on the appraisal, as a response, a decision is made whether to regulate the emotion. The attention-appraisal model of alexithymia (Preece et al., 2017) specifies that some level of alexithymia (i.e., a low, average, or high level) will be present in these valuation systems with an emotion at the situation stage, manifesting as one's degree of difficulties at the attention and appraisal stages; the *externally oriented thinking* facet of alexithymia is one's degree of difficulty at the attention stage, and the *difficulty identifying feelings* and *difficulty describing feelings* facets of alexithymia are one's degree of difficulties at the appraisal stage. Some of these alexithymic difficulties can be attributed to the developmental level of people's emotion schemas (i.e., those cognitive structures used to process emotions), and this is known as *ability deficit alexithymia*. Additionally, as an emotion regulation response (i.e., the response stage of the second-level valuation system), an individual may decide to try to regulate their emotion by avoiding focusing attention on or appraising emotions in subsequent emotion processing; this is known as *avoidance alexithymia*. Thus, as emotion regulation sequences continue to unfold over time, ability deficit and avoidance alexithymia can both contribute to ongoing deficits in attending to and accurately appraising an emotion.

Assessment of Alexithymia

Several well-validated psychometric tools have been developed to measure alexithymia. Most of these are self-report questionnaires, but some observer-rated interviews also exist. We focus here on what has traditionally been the most widely used measure, the 20-item Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994), as well as the more recently introduced Perth Alexithymia Questionnaire (PAQ; Preece et al., 2018).

The TAS-20 (Bagby et al., 1994) was among the first self-report measures of alexithymia and has been used in the majority of alexithymia research. It was originally designed to provide a total score as an overall marker of alexithymia, but Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally Oriented Thinking subscales are also commonly derived. The TAS-20 has been shown to have generally good validity and reliability across a range of samples and languages, though some psychometric issues have been noted. Most prominently, the Externally Oriented Thinking subscale usually has low reliability ($\alpha < .70$), thus limiting the capacity to confidently capture this facet of alexithymia (Kooiman et al., 2002).

The PAQ (Preece et al., 2018) was introduced in part to try to address the issues measuring externally oriented thinking, as well as to enable valence-specific assessment of alexithymia. This was motivated by findings that other emotion constructs can often function differently depending on the valence of the emotion (Becerra et al., 2021). As such, the PAQ assesses all facets of alexithymia and has some separate subscales for negative and positive emotions (see Table 29.1 for example items from each subscale). All items can also be summed to form a total scale score as an overall marker of alexithymia. The psychometric properties of the PAQ have so far been examined in samples from the

TABLE 29.1. Example Items from the Perth Alexithymia Questionnaire

Subscale	Content measured	Example items
Negative—Difficulty Identifying Feelings (N-DIF)	Difficulty identifying, understanding, and differentiating between one's own negative feelings.	<ul style="list-style-type: none"> When I'm feeling bad, I can't tell whether I'm sad, angry, or scared. When I'm feeling bad, I get confused about what emotion it is.
Positive—Difficulty Identifying Feelings (P-DIF)	Difficulty identifying, understanding, and differentiating between one's own positive feelings.	<ul style="list-style-type: none"> When I'm feeling good, I can't tell whether I'm happy, excited, or amused. When I'm feeling good, I can't make sense of those feelings.
Negative—Difficulty Describing Feelings (N-DDF)	Difficulty describing and communicating one's own negative feelings.	<ul style="list-style-type: none"> When I'm feeling bad (feeling an unpleasant emotion), I can't find the right words to describe those feelings. When I'm feeling bad, I can't talk about those feelings in much depth or detail.
Positive—Difficulty Describing Feelings (P-DDF)	Difficulty describing and communicating one's own positive feelings.	<ul style="list-style-type: none"> When something good happens, it's hard for me to put into words how I'm feeling. When I'm feeling good, if I try to describe how I'm feeling, I don't know what to say.
General—Externally Oriented Thinking (G-EOT)	Tendency to not focus attention on one's own emotions (negative and positive).	<ul style="list-style-type: none"> I tend to ignore how I feel. I don't pay attention to my emotions.

United States, Australia, Turkey, Iran, Singapore, and Chile, including general community, student, and clinical samples, with all studies indicating good validity and reliability for all subscales and the total score (e.g., Fynn et al., 2022). Early findings with the PAQ show that the valence distinction is important, with people typically reporting more difficulties appraising negative emotions than positive emotions (Becerra et al., 2021). Comparisons with the TAS-20 indicate that the TAS-20 is primarily a measure of alexithymia for negative emotions (Chan et al., 2023).

Ideally, self-report measures like the TAS-20 or PAQ are complemented by observer-rated measures like the Toronto Structured Interview for Alexithymia (Bagby et al., 2006), although, as of yet, no observer-rated alexithymia measures provide valence-specific scores. Furthermore, future work is needed to develop and test performance-based measures and those that rely on the processing of (emotional) language produced in naturalistic settings (Aaron et al., 2018). Together, these measures may enable a more comprehensive multimodal assessment of alexithymia.

Clinical Relevance of Alexithymia

Alexithymia is highly prevalent in psychiatric samples, with important implications for case formulations and treatment planning. Over 30% of people in clinical samples usually have problematically high levels of alexithymia, compared to around 10% in the general population (McGillivray et al., 2017). High alexithymia is associated with symptoms from a range of disorders characterized by problematic levels of emotion or emotion dysregulation, including depressive, anxiety, psychosomatic, substance use, eating, and personality disorders (e.g., Leweke et al., 2012). These relationships appear to be bidirectional: high levels of alexithymia may constitute a risk factor for the development of psychopathology via compromising of emotion regulation (Preece et al., 2022), but heightened psychopathology symptoms may also lead to increased emotional avoidance (i.e., avoidance alexithymia; Luminet et al., 2001).

High levels of alexithymia also appear to impair the effectiveness of some psychotherapies. This motivated the early interest in alexithymia, whereby it was observed that people with high alexithymia were often less responsive to psychodynamic psychotherapy (Sifneos, 1973). Different treatment approaches often assume that individuals are able to pay attention to, accurately identify, and describe their emotional experiences. This assumption is problematic for those with high levels of alexithymia and highlights the importance of accounting for this trait in psychotherapy.

One approach is to use techniques that require less emotional awareness (e.g., behavioral strategies, medication), but given the status of alexithymia as a key transdiagnostic risk factor for many psychopathologies, it is likely pertinent to directly target alexithymia in therapy (see also Taylor et al., 1999). From the perspective of the attention-appraisal model, the goal is to develop people's ability to focus attention on and accurately appraise their emotions; a goal achieved by developing their emotion schema systems and reducing their use of experiential avoidance of emotions as an emotion regulation strategy (Preece et al., 2017). Thus, psychoeducation about emotions, therapist guidance in describing and differentiating between emotions, as well as techniques like mindfulness of emotions that bring attention to present emotional states, may be useful. Treatment protocols (e.g., *Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders*; Barlow et al., 2010) that have modules teaching emotional awareness and emotion regulation skills seem good candidates for addressing alexithymia.

Indeed, there is growing evidence that such targeted approaches can meaningfully reduce levels of alexithymia. For example, Edwards et al. (2018) recently demonstrated that mindfulness training can significantly improve emotion labeling in people with high alexithymia, and Neumann et al. (2017) documented reductions in alexithymia following an emotional awareness training program in patients with traumatic brain injury. Nonetheless, with targeted alexithymia treatments still being a fairly new area, more work is needed to determine optimal approaches when treating individuals with high alexithymia.

Alexithymia and Emotion Regulation

As aforementioned, much of the link between alexithymia and psychopathology may be explained by dysfunctional emotion regulation (Preece et al., 2022). Successful emotion regulation requires multiple complex processes in *identifying* when to regulate emotions; *selecting* appropriate regulation strategies; *implementing* them in one's context; and *monitoring* their effect to determine whether to continue, switch, or stop emotion regulation attempts (Gross, 2015). Conceptually, these processes are optimally facilitated by accurate attention to and appraisal of the emotional state, and thus likely affected in those with high alexithymia. Furthermore, if a person's alexithymia is primarily due to attempts to avoid focusing on emotion (i.e., avoidance alexithymia), this manifestation of alexithymia can also be seen itself as a form of emotion regulation (Preece et al., 2017).

To date, most of the empirical research on alexithymia and emotion regulation has focused on the selection of emotion regulation strategies. Findings show that people with high alexithymia tend to use less generally adaptive strategies (e.g., cognitive reappraisal) and more avoidant or generally maladaptive strategies (e.g., expressive suppression; e.g., Luminet & Zamariola, 2018). There is also evidence that people with high alexithymia are less effective at implementing adaptive regulation strategies when instructed to do so (Pollatos & Gramann, 2012). More broadly, regarding overall emotion regulation ability, people with high alexithymia consistently report more emotion regulation difficulties, as well as higher levels of negative affect or distress and lower levels of positive affect (i.e., suggesting difficulties in up- and down-regulating their emotions; see Luminet & Zamariola, 2018, for a review).

In summary, the available evidence presently indicates that alexithymia may compromise emotion regulation. Moving forward, more work using ecological momentary assessment approaches (Koval et al., 2022) is needed to determine more precisely how alexithymia is associated with each of the identification, selection, implementation, and monitoring processes of emotion regulation in daily life settings. This information can potentially inform more integrated treatments of alexithymia and emotion regulation problems.

Future Directions

There are several other key areas where we think future research in the alexithymia field will be particularly beneficial. One of the most pressing issues relates to the ongoing debate about the very definition of the construct, and whether *constricted imaginal processes* (i.e., not daydreaming or fantasizing as frequently as other people) might represent a fourth core facet of alexithymia (Bagby et al., 2006). This proposal stems from early

psychoanalytical-based observations of alexithymic individuals, noting impoverished fantasy and reduced frequency of daydreaming, among other features (Sifneos, 1973). However, most of the empirical work has so far indicated that daydreaming problems are not part of the same construct as difficulties identifying feelings, difficulties describing feelings, and externally oriented thinking (see Preece et al., 2020). Subsequently, the most commonly used alexithymia assessment tools do not include the measurement of daydreaming. Nevertheless, because studies have so far relied on trait questionnaires, it is unclear how alexithymia is related to the frequency and content of daydreaming (or mind wandering) as measured with experience sampling or daily diaries. Moreover, daydreaming is continuous with nighttime dreaming, and both reflect imaginal processes, one during wakefulness, the other during sleep. Thus, future studies should examine the relationship between alexithymia and different aspects of daydreaming and nighttime dreaming, utilizing relevant conceptual distinctions and established experimental methodologies from the fields of mind-wandering and dream research (Sikka et al., 2021).

Another key growth area is to explore whether distinct alexithymia profiles (i.e., at the facet level across difficulties identifying feelings, difficulties describing feelings, and externally oriented thinking) characterize different categories of psychopathology (Leweke et al., 2012). This may help shed light on how transdiagnostic mechanisms can simultaneously account for commonalities, as well as differences between different psychopathologies. The PAQ may additionally help distinguish relative difficulties in the processing of negative versus positive emotions. Relatedly, it is possible that the relative contributions of ability-deficit alexithymia and avoidance alexithymia may differ between people high in alexithymia (Preece et al., 2017). This line of reasoning follows from early distinctions between *primary alexithymia* and *secondary alexithymia* (Sifneos, 1996), and the putative differences in the neural substrates underlying different hypothesized alexithymia subtypes (Lane et al., 2020). Future studies using latent profile analysis of measures of alexithymia and experiential avoidance may help determine the existence of possible subtypes (i.e., different profiles) of alexithymia, and the extent to which these might provide a more nuanced understanding of the relationships between alexithymia, psychopathology, and emotion regulation patterns. In the context of precision psychiatry, greater specificity in understanding the nature and mechanisms of alexithymia may ultimately lead to more optimized and effective treatments of psychopathology.

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CHAPTER 30

Valence Bias

INDIVIDUAL DIFFERENCES IN RESPONSE TO AMBIGUITY

MAITAL NETA

As we move around the world, one of the most important things we can do as a living organism is to know the difference between things that are good for us or bad for us, and to move toward the good and away from the bad. Thankfully, there are objects and situations in the world that readily announce themselves as being one or the other (see Figure 30.1A)—however, we often encounter things that don’t announce themselves as being particularly good or bad for us, and so we are left to make a decision about a particular stimulus with incomplete information. For example, ambiguities are inherent in decision making across many contexts, including financial (e.g., peaks and valleys of a stock), health (e.g., social distancing), and interpersonal (e.g., a stranger looking at you) domains. These ambiguities require that we choose—somewhat in the dark—between alternatives that are associated with both positive and negative outcomes. In other words, we must decide for ourselves whether we believe the outcome is likely to be positive or negative in this instance, and these choices can have profound consequences. So the question is How do we deal with this type of ambiguity?

At one extreme, one could imagine that an organism’s determination of valence is driven exclusively by the situation. For example, every single time humans encounter a dark alley, we choose to avoid it. At the other extreme, one could imagine that an organism’s determination of valence is driven exclusively by the organism itself. For example, *you* might, on every instance of encountering a dark alley, choose to approach. But the world we live in is much more complex than these two extremes; both situation- and organism-level information is important. Having said that, this chapter focuses on the portion of the variance driven by the organism, revealing that there are stable organism-level differences in valence decisions made in response to ambiguity (i.e., individuals differ from one another, but individuals are also stable over time), and what gives rise to them.

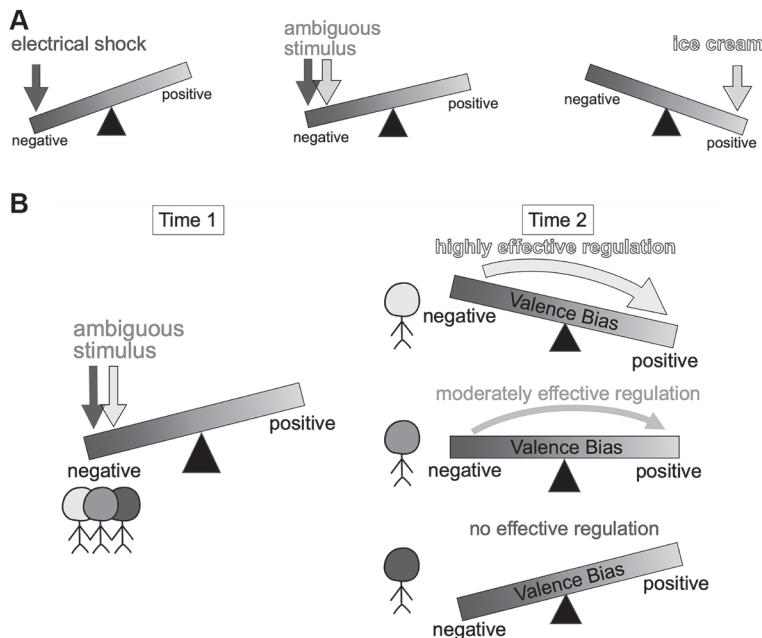


FIGURE 30.1. A mechanistic account of valence bias. (A) Affective responses to clearly negative (left) and clearly positive (right) stimuli. Responses to ambiguous stimuli are characterized by an initial negativity, regardless of whether someone ultimately shows a more negative valence bias (dark gray arrow) or a more positive bias (light gray arrow). (B) Unpacking the response to ambiguity reveals an initial negativity across individuals with different valence biases (Time 1: left, which is taken from Panel A). This initial negativity is updated with a more regulated (less negative) bias in some people (Time 2: light gray individual at top right), or is maintained as a less regulated (more negative) bias in others (Time 2: dark gray individual at bottom right). This variability in valence bias, of course, lies on a continuum, such that there are also individuals who might display moderate regulation and show a valence bias that is somewhere in the middle (medium gray individual at center right).

Research in this domain has explored individual differences in *valence bias*, or the trait-like tendency to evaluate ambiguous cues—those that have an equally valid positive and negative meaning—as either positive or negative. The construct of valence bias extends prior work on negative interpretation bias (i.e., the tendency to interpret stimuli as negative when a neutral interpretation is also possible) that largely overlooked an important factor: the potential to evaluate ambiguity as positive. Valence bias is stable within individuals (Neta et al., 2009; Harp, Freeman, et al., 2022), suggesting that there is important organism-level variation in our responses to ambiguity that is evident even when controlling for state or situational effects. This bias also generalizes across different categories of dual-valence ambiguity (emotional faces, scenes, and words; Neta et al., 2013; Harp et al., 2021; Neta & Brock, 2021). Thus, valence bias represents a trait-like difference between individuals.

Notably, valence bias is consequential: it is linked with important psychological and physical measures of well-being. For example, a more negative valence bias is associated with greater symptoms of depression and anxiety (Park et al., 2016; Petro, Tottenham, et al., 2021; Neta & Brock, 2021), increased stress reactivity (Brown et al., 2017), and lower

levels of physical activity (Neta et al., 2019). In addition, a less negative valence bias is associated with greater social connectedness (Neta & Brock, 2021), greater trait reappraisal (Harp, Gross, et al., 2022), and a pattern of brain activity/connectivity suggestive of emotion regulation (Petro et al., 2018; Petro, Tottenham, et al., 2021). Relatedly, we found that the negative bias that resulted from a stress induction (Brown et al., 2017) was buffered by greater trait reappraisal (Raio et al., 2021). Although there could be bidirectional influences between valence bias and well-being (e.g., when one is anxious, they can experience exaggerated negativity), this work has focused on establishing associational links between organism-level variability in valence bias and well-being (see the “Valence Bias Is Malleable” section for causal findings).

Given that valence bias is stable and consequential, it is critical to understand the mechanisms that produce this bias, and their susceptibility to intervention. Toward that end, research in the last decade has leveraged a variety of experimental approaches that culminate in an overarching framework for how the individual differences in valence bias arise. Accumulating evidence suggests that the likely mechanism is a dynamic, two-stage process that begins with an initial negativity (i.e., even for those who eventually evaluate the stimulus as positive, branding this framework the *initial negativity hypothesis*), and evolves into a more regulated (less negative) bias in some people, or is maintained as a less regulated (more negative) bias in others (see Figure 30.1B). Interestingly, some evidence has suggested that this regulatory process that putatively supports a more positive bias is similar to reappraisal. Reappraisal is often depicted as a slow, conscious, and controlled (i.e., explicit) process, but it can also be a fast, unconscious, and automatic (i.e., implicit) process (Braunstein et al., 2017) that comes online even in a fast-paced laboratory task.

A Mechanistic Account: The Initial Negativity Hypothesis

Several lines of evidence corroborate the initial negativity hypothesis described above. First, the distinction between the initial appraisal and subsequent reappraisal is evident in studies of the dynamic unfolding of affective responses to ambiguous stimuli. For instance, mouse-tracking studies revealed that positive evaluations of ambiguous stimuli are characterized by an initial motoric attraction to the competing (negative) response option (Brown et al., 2017; Neta et al., 2021). Relatedly, even simple button-press tasks reveal that positive evaluations require longer reaction times than negative evaluations, suggesting an additional (putatively, reappraisal) process may be involved in producing a positive evaluation (Neta et al., 2009; Harp, Freeman, et al., 2022). Further, a vision science approach supports the initial negativity hypothesis. For example, ambiguous images that are low-pass filtered—thereby favoring brain mechanisms that produce early visual representations—elicit more negative responses than those that are high-pass filtered (Neta & Whalen, 2010; Neta et al., 2017).

Second, the subsequent reduction in initial negativity depends on cognitive resources. For instance, participants tend to feel more negative about ambiguity under high compared to low concurrent cognitive load (Salter et al., 2022). Consistent with this idea, when people are instructed to deliberate about ambiguous stimuli, thereby investing more cognitive resources, they tend to appraise these stimuli as less negative (Neta & Tong, 2016). Conversely, inducing a state of stress, which promotes hypervigilance and reduces cognitive control, results in a more negative response (Brown et al., 2017). Further, developmental findings have demonstrated that children (ages 6–13 years) who have weaker

cognitive control and regulatory support (Gee et al., 2013) show a more negative valence bias than adults (Tottenham et al., 2013; Petro, Tottenham, et al., 2021).

Third, neuroimaging studies suggest an initially negative appraisal followed by positive reappraisal. Negative responses to ambiguity recruit greater amygdala activation, whereas more positive responses recruit greater prefrontal activity (Kim et al., 2003; Petro et al., 2018). Furthermore, individuals who respond more positively to ambiguity show greater inverse connectivity between the amygdala and a region of the medial prefrontal cortex associated with emotion regulation (Petro, Tottenham, et al., 2021). These findings align with the idea of an initial negative appraisal driven by the amygdala being later updated within a broader brain network involved in emotion regulation (Frank et al., 2014).

Valence Bias Is Malleable

Building on this mechanistic framework for how individual differences in valence bias arise, we set out to explore its susceptibility to intervention. In other words, by identifying what processes, if any, interfere with this mechanism—causing a shift in bias in either the more or less negative direction—we can better understand the mechanism supporting a naturally occurring bias. For example, a process that “tips the scale” (see Figure 30.1B; i.e., shifting one’s bias from the initial negativity to a less negative response) could inform the mechanism at play in individuals with an intrinsically less negative bias. Relatedly, identifying processes that “tip the scale” could inform future work that aims to intervene in situations where one’s valence bias is maladaptive. For example, some individuals might have an extreme negative bias that interferes with their daily functioning (as in many cases of depression or anxiety). Thus, interventions that successfully shift one’s valence bias might be useful tools for alleviating this chronic negativity.

As such, the next step in our work was to examine cases in which the valence bias is malleable. Again, this focus on malleability serves several purposes: (1) it further informs the mechanism supporting valence bias—reaffirming the notion of an initial negativity, and a regulatory mechanism that subsequently reduces it; and (2) it provides a foundation for exploring which interventions can move people away from a maladaptive bias. Further, experimental manipulations that shift valence bias are useful in moving from associational to causal links with bias, identifying organism-level factors that *drive* one to evaluate ambiguity more or less negatively.

Extensive work conducted in recent years has revealed that valence bias is malleable. Earlier work paved the way for these findings by demonstrating that valence bias is highly sensitive to context, including a temporal context of clearly valenced—positive and negative—stimuli (Davis et al., 2016; Kim et al., 2003; Neta et al., 2011). Building on these findings, we explored the effects of various interventions on valence bias; we focus our discussion below on work that manipulated stress. This work has focused on shifting valence bias in response to ambiguous (surprised) faces, though future work can and should extend these effects to other stimulus types.

Daily life is marked by exposure to stressors known to elicit neurophysiological responses that exert powerful effects on brain function and behavior. For example, acute stress exposure is linked to negative affect (Dickerson & Kemeny, 2004), diminished cognitive control (Schoofs et al., 2009), and reduced regulation of negative emotion (Mennin et al., 2005). In our work, we manipulated acute stress levels in healthy individuals and

found that individual differences in stress reactivity—indexed by cortisol change relative to baseline—were associated with a negative bias (Brown et al., 2017).

Building on these findings, we explored the effects of stress reduction on valence bias. One well-established method for reducing stress that has garnered increasing attention is the practice of mindfulness. Mindfulness is characterized by a conscious attention to the present moment and a nonjudgmental/nonreactive attitude toward one's bodily sensations, thoughts, and emotions (Bishop et al., 2004). Mindful meditation may lead to greater conscious control (Chambers et al., 2008), supporting more flexible and adaptive responses (e.g., positive reappraisals). Following an 8-week mindfulness intervention, we found a relatively long-lasting shift toward a less negative valence bias that continued 8 weeks after the intervention ended (Harp, Freeman, et al., 2022). These findings suggest that this intervention helps one to see the “bright side” (e.g., reframing a stressor as a challenge), or at least not react to ambiguity with a knee-jerk negativity. Consistent with these findings, an instruction to deliberate (i.e., reducing reactivity) was found to reduce a negative bias (Neta & Tong, 2016), and greater trait reappraisal was found to buffer stress-related negativity (Raio et al., 2021).

Taken together, these findings show bidirectional influences of stress. A stress induction impeded the regulatory process that helps to mitigate the initial negativity, resulting in a negative bias. Conversely, stress reduction—through mindful meditation—may encourage reappraisal that helps people move away from the initial negativity. It is worth noting that a number of manipulations have been shown to shift valence bias. As evident in the example above, we expect that these effects operate on the second (regulatory) stage of our mechanism—either impeding or boosting the reappraisal process that helps to mitigate the initial negativity (Neta et al., 2022). To date, we have found no evidence that these manipulations might impact the first stage (e.g., blunting the initial negativity). This knee-jerk negativity is thought to occur so quickly so as to be impervious to change, unless by implementing earlier emotion regulation strategies (Gross, 1998), such as situation selection (e.g., avoiding ambiguous situations altogether).

Limitations and Future Directions

Valence bias has been characterized as an individual difference that is stable, generalizable, consequential, and malleable—however, there are several limitations to this research to date, which link to these facets of valence bias. First, valence bias is stable, but these findings rely on two alternative forced-choice categorizations of ambiguity (positive or negative) that conflate increased positivity with decreased negativity. Future work should tease apart these effects using unipolar scales to determine the extent to which one's stable bias leans—for example, toward negativity or away from positivity.

Second, valence bias generalizes across different categories of emotional ambiguity (faces, scenes, words)—however, very little work has extended laboratory findings to determine the ways in which valence bias translates to emotional responses in the real world.

Third, valence bias is consequential—however, future work could characterize the *mechanisms* that link valence bias to well-being (e.g., depressive symptoms). For example, it could be that an individual with greater depressive symptoms succumbs to the initial negativity due to an emotion regulation failure (i.e., not regulating when it would be helpful to do so) versus misregulation (i.e., using a poorly matched regulatory strategy). Even

within this latter category, this person might fail at various stages of the emotion regulation process (e.g., implementation of a regulatory strategy vs. monitoring its success).

Building on research examining putative consequences of valence bias, future work could explore *antecedents of valence bias* (e.g., what drives an individual to have a more positive vs. negative bias). For example, we have begun exploring the extent to which intrinsic brain organization predicts valence bias, even in childhood. Also, children's development is substantially impacted by interactions with caregivers and family systems (Cooke et al., 2019), but the caregiver's role in the development of valence bias is largely unexplored.

Fourth, valence bias is malleable, which provides new insights into interventions that help one overcome a maladaptive bias—however, it is yet unclear what constitutes an *adaptive response* to ambiguity. A more positive bias is associated with greater psychological and physical well-being, but a positive bias may not always be adaptive. We have begun exploring a novel measure of affective flexibility that represents one's ability to flexibly categorize ambiguous stimuli as positive or negative as a function of changing circumstances. This work could lend itself as a treatment target, given that individuals who show greater flexibility are putatively more sensitive to contextual manipulations, and thus may benefit the most from interventions.

Finally, research on malleability has enabled a shift from associational to causal links with bias. For example, one study created a moving viewing window based on the eye movements of a participant with a highly negative, and another with a highly positive, bias (Neta & Dodd, 2018). The visual input associated with a specific bias was sufficient for shifting new participants' bias; viewing the faces "through the eyes" of someone with a positive bias resulted in a greater perception of positivity. Relatedly, other work manipulated time perspectives, where an extended perspective (associated with early life) prioritizes future-focused, preparatory goals, while a limited perspective (associated with later life) prioritizes present-focused goals for achieving well-being (Carstensen, 1993). We found that an extended time perspective resulted in a more negative bias, and a limited perspective resulted in greater positivity (Neta et al., 2018)—a pattern that is consistent with a shift from a more negative to positive bias across the lifespan (Tottenham et al., 2013; Petro, Tottenham, et al., 2021; Petro, Basyouni, et al., 2021). While this work reveals organism-level factors that *drive* one to evaluate ambiguity negatively or positively, the mechanism at play is unknown, and should be the target of future work.

ACKNOWLEDGMENTS

I would like to thank James Gross for helpful discussion in early drafts of this chapter, and Nicholas R. Harp, Jordan E. Pierce, Michael D. Dodd, and Jeffrey R. Stevens for comments on a prior version of this chapter.

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CHAPTER 31

Self-Control

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JAMES J. GROSS

Across centuries and cultures, humans have considered self-control to be a crucial life skill. Aristotle argued that self-control was essential for overcoming *akrasia* (“weakness of will”). Buddhist teachings likewise assert that those who master themselves are undefeatable. A moment of introspection confirms millennia of philosophical reflection: There are countless occasions on which the impulse to act, think, or feel in a certain way is at odds with what we know is best, and we must use self-control if we are to achieve our most cherished goals.

Recently, self-control has taken center stage as a research topic in psychological science and in the adjacent disciplines of neuroscience, economics, and sociology. In this chapter, we address five foundational questions related to self-control:

1. What is self-control?
2. Is self-control difficult?
3. How are impulses generated?
4. How can impulses be regulated?
5. What are promising directions for future research?

What Is Self-Control?

Self-control refers to the pursuit of an enduringly valued goal despite the momentary dominance of a less valued alternative. It thus involves situations in which one impulse (e.g., to go for a run) is recognized as more enduringly valued than another impulse (e.g., to binge-watch Netflix), but that other impulse is nevertheless more alluring in the moment (see Figure 31.1).

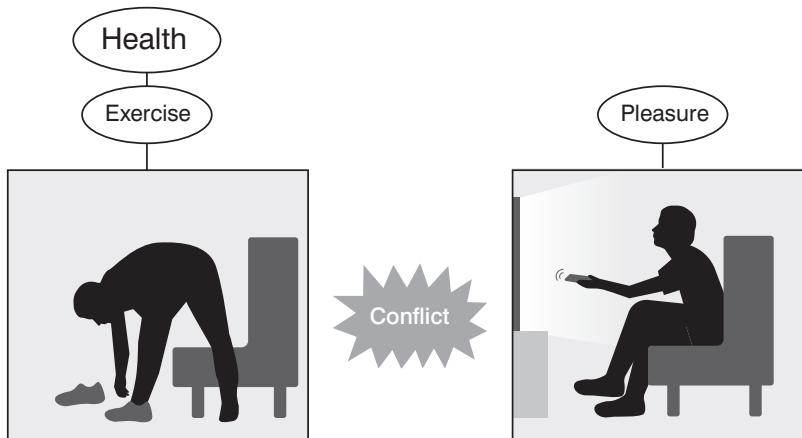


FIGURE 31.1. Self-control occurs when one impulse (e.g., to go for a run) advances a more enduring valued goal (e.g., to exercise, which in turn advances the higher-level goal of staying healthy), and this is incompatible with a momentary impulse (e.g., to binge-watch Netflix) that advances a more immediately gratifying alternative (e.g., experiencing pleasure).

Typically, the more enduringly valued goal is embedded in a goal hierarchy that extends “upward” to abstract, identity-relevant goals. In contrast, the less enduringly valued goal tends to be cued by the environment and not linked to higher-level, identity-relevant goals. According to this definition, choosing between two equally valued responses (e.g., deciding which Netflix show to binge watch) may be difficult but is not an exercise in self-control. Instead, it is an instance of self-regulation, a superordinate category that broadly includes not only self-control but also all goal-directed processes.

Self-control is voluntary. Thus, reluctantly complying with authority (e.g., resentfully donning a face mask to avoid getting kicked off a plane during a pandemic) is *not* demonstrating self-control. Nor is doing what’s good for ourselves accidentally (e.g., skipping dessert because we forgot to buy ice cream at the supermarket) or as the unwitting accomplice to a benevolent policymaker (e.g., failing to notice that we’ve been defaulted into saving 5% of our wages for retirement; Duckworth & Gross, 2020).

While intentional, self-control is not always enacted with conscious awareness. In fact, self-control often takes the form of plans or habits (e.g., *When I get hungry, then I will eat an apple*) that are formed in advance and, once cued, are enacted automatically (Bargh et al., 2010; Wood et al., 2014; Galla & Duckworth, 2015).

Is Self-Control Difficult?

The colloquial term *willpower* suggests that choosing to do what we know is best, despite a momentarily dominant alternative, can give rise to sensations of effort and fatigue—which is what adults in laboratory studies report experiencing when completing tasks designed to tax self-control (Hagger et al., 2010; Kurzban et al., 2013). Likewise, the grimaces and wriggling of children attempting to delay gratification in the famous marshmallow task, or individuals of any age completing executive function tasks like the go/no-go task, suggest that elevating one impulse while suppressing another can feel

depleting (Mischel, 1996). This phenomenology has given rise to the intuition that self-control is a limited resource that runs out with use (Wallace & Baumeister, 2002), but preregistered, multilaboratory evidence challenges this view (Vohs et al., 2021).

However, exercising self-control need not feel awful. Indeed, exercising self-control can be painless (Gillebaart & de Ridder, 2015). Counterintuitively, more self-controlled individuals tend to spend *less* time effortfully modulating their impulses than more impulsive individuals (Hofmann et al., 2012). How do we square these seemingly contradictory accounts of the phenomenology of self-control? It turns out that directly modulating impulses in the heat of the moment is only *one* way to govern conflicting impulses (Duckworth, Gendler, et al., 2016). Self-control can also take the form of strategies that proactively strengthen desirable impulses or weaken undesirable ones while they are still nascent, minimizing the direct conflict that gives rise to feelings of inner strife.

How Are Impulses Generated?

Understanding the myriad ways impulses can be regulated requires understanding how impulses to act, feel, or think are generated in the first place. As illustrated in Figure 31.2, the process model of self-control (Duckworth & Gross, 2020) specifies a four-stage, recursive process by which any impulse to act, feel, or think in a certain way is generated. The same sequence applies whether impulses are immediately gratifying but later regretted (as shown in Figure 31.3) or less enjoyable in the moment but of enduringly greater value (as shown in Figure 31.4).

To begin, a person exists in an objective *situation*. Sometimes situational influences are obvious (e.g., it is difficult to exercise outdoors when your neighborhood is unsafe). At other times, situational influences are less obvious (e.g., the social norms to exercise vary by peer group). But not everyone responds in the same way to identical circumstances. How a person responds also depends on the idiosyncratic mental structures (goals, beliefs, memories, schemas, attitudes, habits, associations, etc.), collectively referred to as the social-cognitive mechanisms (Fleeson & Jayawickreme, 2021) or cognitive-affective units (Mischel & Shoda, 1995) that underlie our individual personalities.

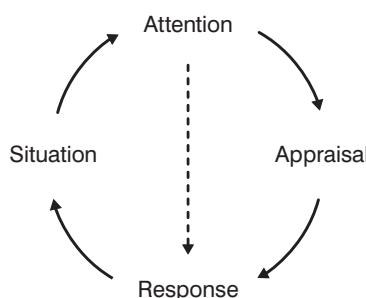


FIGURE 31.2. The process model of self-control identifies four qualitatively distinct phases, which culminate in the generation of impulse tendencies that, upon reaching a threshold level of activation, are enacted. The cycle is recursive insofar as responses can change the external situation, as well as the mental structures that shape how we direct attention, our subjective appraisals of what we perceive, and so on. The dotted line indicates a “short-cut” path by which response tendencies can be activated without a preceding appraisal.

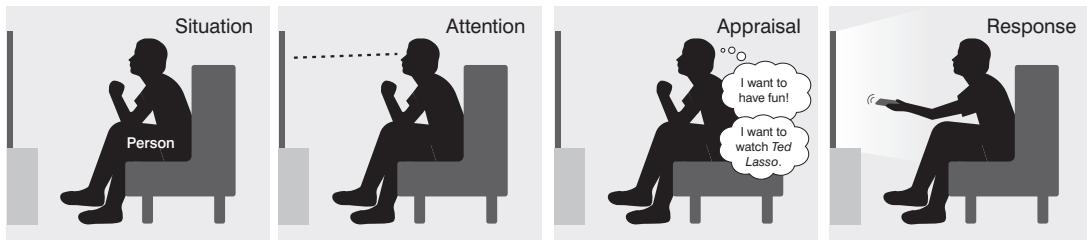


FIGURE 31.3. Impulses are generated in four stages. To begin, a person is in a particular objective situation (e.g., in their living room on the couch). Next, the person's attention is directed to particular features of the situation (e.g., the flat-screen TV on the opposite wall). In the appraisal stage, the person interprets these percepts, making sense of what is happening and generating options for responding (Have fun! Watch *Ted Lasso!*). Finally, once a response tendency reaches a certain threshold, it is discharged, and the person takes action (e.g., grabbing the remote control).

Next comes *attention*. The limits of cognitive processing necessitate that only a tiny fraction of the many features that make up our external situation can be perceived at any moment. This fact is both indisputable and easily forgotten, for what fails to slip through the narrow gate of awareness and instead remains outside the walls of perception is, by definition, ignored. In other words, as Kahneman (2011) puts it, at any given moment, “what you see is all there is” (p. 85). Likewise, only a tiny subset of our internal mental structures can be active at any given time. In one “mode,” goals related to a healthy identity might be more activated than pleasure goals; in a more slothful mode, the converse might be true (Beck et al., 2020). In sum, attention is like a spotlight that illuminates only a few features of the external situation, leaving the rest in darkness, and activates only a few features of the inner mental landscape, leaving the rest dormant.

Third, in the *appraisal* stage, we come to a subjective interpretation of what we are perceiving. Inevitably, our percepts are incomplete and ambiguous, forcing us to make inferential leaps to ascertain “what’s going on.” The top-down completion of gestalt percepts from sparse input was first discovered for vision but has since been extended to all sensory modalities (Gilbert & Wilson, 2007). Crucially, it is our activated mental structures that complete the picture, including a judgment as to how our perceived situation

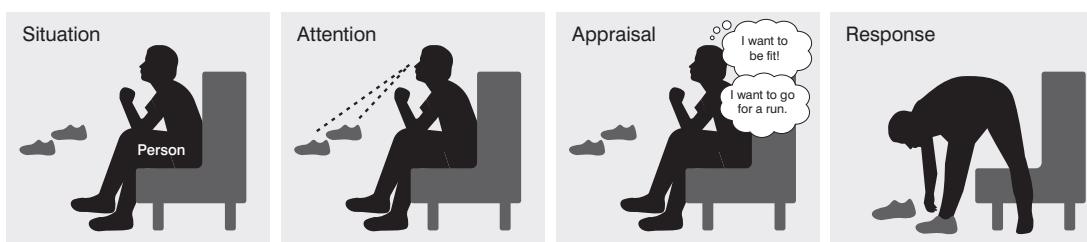


FIGURE 31.4. Each of the four stages of the process model presents an opportunity for self-control. To begin, a person can choose or change the objective situation (e.g., placing sneakers next to the couch). Next, the person can direct attention to particular features of the situation (e.g., looking at the sneakers). In the appraisal stage, the person can interpret these percepts and generate options for responding that are consistent with enduringly valued goals (Get fit! Go for a run!). Finally, the person can deliberately take a certain goal-directed action (e.g., lacing up their sneakers).

compares to what we would like our situation to be (Carver & Scheier, 2002) and imagined actions that we might take in response (Seligman et al., 2013).

Finally, in the *response* stage, subjective appraisals give rise to tendencies to act, feel, or think in certain ways. When sufficiently strong, these impulses are enacted. How we respond, of course, changes our objective situation. Less obvious, but equally consequential, is the fact that we can respond by changing mental structures, too. We can set new goals, give up on old ones, update our beliefs and attitudes, and so on. Thus, although the process model is inherently one-way, any stage can influence any other stage by means of recursive cycling (e.g., a change in how we appraise a situation can lead to a response that in the next cycle changes the situation).

While the situation–attention–appraisal–response sequence is common, it is also possible for the appraisal stage to be abridged. In this abbreviated sequence, certain situational cues draw attention and trigger responses without elaborated appraisal. This is most obvious in the case of habits, responses to cues that have been reliably and repeatedly rewarded in the past, and also Pavlovian responses, stereotyped responses to biologically relevant stimuli (Daw & O’Doherty, 2014).

How Can Impulses Be Regulated?

What can an individual do to adjudicate conflicting impulses in favor of their enduringly valued goals? The process model of self-control suggests several distinct families of strategies, taking aim at the situation, attention, appraisal, and response stages. It also suggests the possibility of creating a shortcut connecting particular situational features with desired responses. In each case, self-control can take the form of strengthening desirable impulses, weakening undesirable impulses, or both.

To begin, we can either select or modify our situations. As shown in Figure 31.4, intervening at this first stage in the process model can be especially efficient insofar as it biases what happens in subsequent stages (Duckworth, Gendler, et al., 2016). Put simply, the objects and people in our immediate environment constrain and direct what enters awareness at the attention stage; in turn how we appraise our circumstances and options; and, finally, our responses. Of course, it is not always possible to arrange our circumstances in order to further our enduringly valued goals or to weaken competing impulses. For instance, a teenager may prefer studying at the local library but lack the means of getting there. It may be equally infeasible to turn off the family television.

Without changing the objective situation, attentional strategies increase the salience of more enduringly valued goals or decrease the salience of temptations. For instance, keeping a food diary keeps a healthy-eating goal active, directing attention to more nutritious options and making “mindless snacking” more noticeable (Harkin et al., 2016). Likewise, delaying gratification is facilitated by looking away from temptations or engrossing oneself in an alternative activity (Mischel & Ebbesen, 1970).

Even when the objective situation is ineluctable and temptations are unavoidably conspicuous, appraisal strategies can shape how we make meaning of what we perceive. The idea of rethinking what we are perceiving isn’t entirely intuitive, because the spontaneous and instantaneous appraisals we construct tend to feel like “reality”—however, a half-century of research in clinical and social psychology has shown that how we interpret our circumstances is subjective and open to revision (Beck & Dozois, 2011; Ross, 2018). In particular, we can intentionally appraise our situations in ways that heighten activation of long-term goals or dampen the allure of temptations. For example, it may be helpful

to frame valued goals as core to who we are as a person (Berkman et al., 2017): “I’m the sort of person who goes for a run, even when I’m feeling lazy!” Temptations, too, can be reappraised. For instance, preschool children are able to resist eating a marshmallow when they think of them as “white and puffy” clouds (Mischel & Baker, 1975, p. 257).

Appraisals lead to response tendencies that, upon crossing a certain threshold of activation, become discharged as actual behavior. It is possible in this final stage of the process to directly modulate our responses—which is colloquially known as mustering “willpower.” Response modulation is the least artful and proactive of all approaches to self-control. For example, when reluctant to go on a run, one can exhort oneself to “just do it!” Or, when cajoled by peers to smoke or drink, one can “just say no!”

In addition to targeting the various stages of impulse generation, it is possible to forge links between anticipated situational cues and desired responses. Shortcut strategies are especially effective for self-control, because in the heat of the moment, temptations are typically judged as more valuable than alternatives that in the long run are far superior (Rachlin, 2000). Shortcut strategies include creating implementation plans (“If it is 5 P.M., then I will go for a run!”), a technique whose benefits and mechanisms have been documented extensively in both lab and field settings (Gollwitzer & Sheeran, 2006). There is less empirical research on personal rules (Ainslie & Haslam, 1992), which take the form of rigid declarations (“If it is 5 P.M., then I always go for a run—no matter what!”). Over time, cue–behavior sequences that are reliably rewarded can become habitual, requiring little-to-no conscious effort to enact (Wood, 2019).

What Are Promising Directions for Future Research?

The science of self-control is yielding answers to basic questions about what self-control is, why it can feel so difficult, how both desirable and undesirable impulses are generated in the first place, and how we can intentionally regulate impulses—not only using brute-force effort, but also more proactive, strategic approaches.

We see several promising directions for future research.

The process model predicts that, other things being equal, strategies deployed earlier in the process are more effective than strategies deployed later—however, only a handful of studies have tested this conjecture experimentally (Duckworth, White, et al., 2016), and experience sampling methodology studies have generated mixed findings (Kizilcec et al., 2020). While timing is important, there may also be other factors at play, including the type of impulse (emotion, thought, action) that requires regulating, context-specific affordances and obstacles, and individual differences in executive function and metacognitive sophistication. Research is needed to establish which approaches work best under what conditions and for whom.

Self-control presupposes goal conflict, raising the question Is it possible to change our goals to avoid conflict altogether? Consider, for example, two friends who are devoted to their weekend running routine, not because they are adept at up-regulating the “go for a run” impulse and down-regulating any competing impulses but, instead, because they have found ways to align two valued goals (Stay fit! Stay in touch with my best friend!)—bundling their run with cell phone calls to each other (Milkman et al., 2014). More research is needed to probe the extent to which “should” goals can be changed to “want” goals and how durable such shifts might be over time (Werner & Milyavskaya, 2018).

Finally, to what extent does an explicit understanding of how self-control works facilitate self-control? Human beings are fully capable of seeing without a mechanistic

understanding of the visual system, of breathing without knowing how the lungs work. Also, self-control tends to improve across development without formal instruction (Duckworth & Steinberg, 2015). Nevertheless, it may be that self-control is best conceived of as a toolbox of skills whose development can and should be accelerated, and ongoing field studies are testing that hypothesis (Fujita et al., 2020).

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CHAPTER 32

Emotion Goals

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DANFEI HU

Imagine yourself on a boat. Sometimes you drift with the current, allowing the waves to carry you, but sometimes you set a destination and navigate toward it. Your destination determines whether you start sailing, where you steer the wheel, how you operate the boat, and ultimately where you end up. Similarly, we are often carried away by our emotions, but sometimes we set an emotional destination and try to navigate toward it. We refer to this emotional destination as an emotion goal. Like other types of destinations, we propose that emotion goals determine the initiation, direction, means, and outcomes of emotion regulation. In this chapter, we define emotion goals, describe how they differ and why, review how they operate, and consider their implications.

What Are Emotion Goals?

An emotion goal is the cognitive representation of a desired emotional state, which can vary in both pleasure and arousal (Tamir, 2016). Emotion goals can refer to states that we desire, in general (e.g., Tamir et al., 2015) or in the moment (e.g., Tamir & Ford, 2012). Emotion goals can refer to states that we desire as individuals or as group members (e.g., Porat et al., 2016). They can also refer to states we desire for ourselves or for others (e.g., Netzer et al., 2020). Although they can be activated outside of conscious awareness, most research has focused on emotion goals that are consciously accessible.

How (and Why) Do Emotion Goals Differ?

People are likely to select a destination that has value to them (i.e., attracts or repulses them). Similarly, people are likely to endorse an emotion goal that has value to them. An emotion would have more (vs. less) value when it is associated with more desirable

outcomes and fewer undesirable outcomes. The value of emotions may be derived from their own hedonic value (e.g., happiness is valuable because it feels good) or from their instrumental value (e.g., happiness is valuable because it draws people to me). Such instrumental value could stem from the potential effects of emotions on behavior, cognition, or social interactions (Tamir, 2016). Given that value is relative and subjective, the perceived value of emotions is likely malleable and varies across situations, individuals, and cultures.

Emotion Goals Differ across Situations

The value of an emotion depends on the context in which it occurs. Experimental studies have shown that manipulations of contextual demands shape emotion goals. For instance, anger is more desirable when people try to assert themselves than appease others (e.g., Tamir & Ford, 2012), and compassion is less desirable when it is more costly (e.g., Cameron & Payne, 2011). Emotion goals in daily life also vary considerably across situations, with greater variability within, than between, individuals (Wilms et al., 2021). In fact, compared to individuals suffering from mental disorders (e.g., depression; Yoon et al., 2016), healthy individuals are able to change emotion goals more flexibly to address contextual demands. Such findings attest to the importance of situational flexibility in emotion goals for psychological health.

Emotion Goals Differ across Individuals

Emotion goals differ as a function of individual differences, such as affective dispositions, personal values, age, and culture. In addition to their descriptive and applied value, these individual differences can shed light on factors that shape emotion goals.

Affective Dispositions

Individuals are likely to endorse emotion goals that correspond to their typical affective experiences (Ford & Tamir, 2014). People who tend to experience unpleasant emotions show stronger preferences for unpleasant emotions, whereas those who tend to experience pleasant emotions show stronger preferences for pleasant emotions (Hemenover & Harbke, 2020). Similar patterns have been observed in clinical samples. For instance, depressed individuals show stronger preferences for sadness and weaker preferences for happiness (Millgram et al., 2015), people with general anxiety disorder report stronger preferences for anxiety (Vanderlind et al., 2021), and those higher in psychopathic traits report stronger preferences for anger (Spantidaki-Kyriazi et al., 2021). Although this has not yet been directly tested, it is possible that familiarity breeds liking, even in the context of emotion.

Personal Values

Differences in emotion goals also stem from differences in personal values. For instance, people who prioritize self-transcendence (e.g., benevolence) report stronger preferences for empathy and love, whereas people who prioritize self-enhancement (e.g., power) report stronger preferences for pride and anger (Tamir et al., 2016). Emotion goals also differ as a function of political ideology. Liberals show stronger preferences for empathy than conservatives do (Hasson et al., 2018). What people value is also reflected in their

personality, which may drive the pursuit of emotion goals. For instance, people higher in agreeableness are more motivated to pursue emotion goals that serve prosocial motives (Eldesouky & English, 2018).

Age

Several age-related differences in emotion goals have been documented. First, preferences for emotions that vary by valence and arousal differ by age. Older adults endorse prohedonic emotion goals more than younger adults do (Riediger et al., 2009), with a stronger preference for pleasant, low arousal states (e.g., calmness; Cohrdes et al., 2017). In contrast, preferences for contrahedonic emotion goals are stronger in adolescence (Riediger et al., 2009). Second, the ability to fit emotion goals to contextual demands may develop with age. Whereas adolescents and adults show stronger preferences for anger in confrontation than in collaboration, this pattern is weaker in children (López-Pérez et al., 2023). Such findings suggest that emotion goals, especially those that are instrumentally driven, are learned through experience.

Other evidence is consistent with the role of learning and socialization processes in shaping emotion goals. Parents teach their children the value of certain emotions (e.g., gratitude; Hussong et al., 2019) and how to modify them. The more parents value an emotion, the more they teach their children to cultivate it (Gentzler et al., 2018). Parents also teach their children when emotions are more (vs. less) valuable. For instance, right-wing Israeli mothers wanted their children to experience empathy toward ingroup members, but not toward outgroup members, and interacted with their children to influence their empathy accordingly (Ran et al., 2023). The emotion goals we endorse, therefore, are likely influenced by the emotions that were valued by those who raised us.

Culture

Culture may shape emotion goals directly by signaling the value of specific emotions (e.g., through storybooks; Tsai et al., 2007). For instance, compared to European Americans, East Asians are less motivated to decrease unpleasant emotions and increase pleasant emotions (Miyamoto et al., 2017). This differential valuation may be driven by the East Asian dialectical cognitive style (i.e., simultaneously entertain contradictions). Culture may also shape emotion goals indirectly by signaling the value of outcomes associated with emotions. For instance, preferences for calmness are stronger in East Asian cultures, whereas preferences for excitement are stronger in Western cultures. This may be partly because calmness facilitates adjustment, which is prioritized in East Asian cultures, and excitement facilitates influence, which is prioritized in Western cultures (Tsai et al., 2007).

What Do Emotion Goals Do?

Having a destination in mind is what distinguishes drifting with the waves and taking charge of the boat. Similarly, the activation of an emotion goal distinguishes between emotional reaction and emotion regulation. First, emotion goals can trigger the initiation of emotion regulation. When an emotion goal is activated, people compare their current emotion to the emotion goal, and if the discrepancy between the two is sufficiently large, they may initiate emotion regulation. Second, emotion goals can determine the direction

of emotion regulation, so that efforts are directed to shift current emotion toward the emotion goal. Third, emotion goals can influence the means selected to regulate emotions. People are likely to select strategies that are expected to shift emotions in the desired direction. Finally, emotion goals can shape the outcomes of emotion regulation, such that the more successful people are in regulating their emotions, the more their current emotion shifts toward the emotion goal.

Studies that manipulated emotion goals have demonstrated their causal impact on the initiation, direction, and outcome of emotion regulation. For instance, leading people to expect anger to be useful led people to increase their anger and consequently feel angrier (Tamir et al., 2015). In fact, sometimes activating an emotion goal (e.g., by telling people to decrease negative emotions) is all it takes to shift people toward their desired emotions (Tamir et al., 2019).

If people generally select means in service of particular goals, then the emotion regulation strategies people select should depend on the emotion goals those strategies serve—that is, people are likely to select strategies that promote the attainment of their emotion goals. For example, people select situations that are likely to elicit the emotions they desire, from music and pictures (e.g., Millgram et al., 2015) to picking a physician (Sims et al., 2014). Similarly, the pursuit of prohedonic emotion goals in daily life was associated with more frequent situation selection, distraction, and reappraisal, whereas the pursuit of contrahedonic goals was associated with more frequent suppression (e.g., Eldesouky & English, 2018). When emotion goals were manipulated, they directly determined the emotion regulation strategies people selected. For instance, when people were instructed to decrease (vs. increase) emotional intensity, they were more likely to select distraction (vs. rumination; Millgram et al., 2019). What people want to feel determines how they regulate their own emotions, and what they want others to feel determines how they regulate others' emotions (Netzer et al., 2020).

Although emotion goals can shape the outcomes of emotion regulation, by shaping whether, in which direction, and how people regulate emotions, they do not necessarily do so. First, even when an emotion goal is activated, people may fail to initiate emotion regulation, if they expect the costs of doing so to outweigh the benefits (Tamir, 2021). For instance, a person may want to feel better, but believes they lack the ability to do so (Bardeen & Fergus, 2020). Second, even when people decide to regulate emotions, they may fail in doing so, if they lack skills or resources.

Where Do We Sail from Here? Implications and Future Directions

How we sail on the sea of emotion depends on our destination. Therefore, understanding emotion goals can inform how we think about and try to impact emotional outcomes. Emotion goals could potentially be altered to facilitate desired emotions and psychological and social outcomes, but this should be done cautiously.

Clinical Implications

Emotions play a role in mental health. Some of the most devastating clinical disorders involve emotional impairments and deficits in emotion regulation. Such deficits may involve ineffective implementation of emotion regulation strategies or the pursuit of unhealthy emotion goals (i.e., emotion goals that lead to undesirable or unhealthy outcomes). It is important, therefore, to assess emotion goals in clinical disorders, especially

those involving deficits in emotion regulation. There is evidence for unhealthy emotion goals in specific disorders, such as depression, and furthermore, manipulating emotion goals may facilitate more adaptive emotion regulatory behavior (Millgram et al., 2023). Future research should test whether and how emotion goals can be altered outside the laboratory in clinical populations, and whether doing so is psychologically beneficial.

Social Implications

Emotions play a role in social interactions. Targeting emotion regulation in social interactions, by changing emotion goals, could potentially reduce intergroup conflicts or facilitate prosocial behaviors. For instance, manipulating the value of anger (e.g., leading people to consider anger as harmful vs. useful) led people to down-regulate anger toward outgroup members and decreased political intolerance (Porat et al., 2016). Similarly, manipulating the value of empathy, by leading middle school children to believe empathy is normative, increased the endorsement of empathy as a desirable goal and increased prosocial behaviors (Weisz et al., 2022). Together, these results demonstrate the potential power of emotion goals in changing social outcomes. Future research could target or incorporate manipulations of emotion goals in interventions designed to decrease prejudice and promote social harmony.

Wellness Implications

Given that emotion regulation plays an important role in well-being, might changing emotion goals promote well-being? Endorsing prohedonic emotion goals may be associated with greater well-being in some contexts (e.g., López-Pérez & McCulloch, 2021)—however, it might not always be advantageous to prescribe prohedonic emotion goals. First, prohedonic emotion goals are stronger in some cultural contexts than in others (Miyamoto et al., 2017), and therefore, it is important to test whether their potential beneficial effects on well-being might also vary by culture. Second, links between prohedonic emotion goals and well-being may not be linear. For example, people who pursue extreme prohedonic emotion goals may have lower well-being (Mauss et al., 2011). It is possible that although some emotion goals are inherently healthy or unhealthy to pursue, different emotion goals may be linked to adaptive outcomes in different people, depending on their values, goals, and social context. These ideas could be tested in future research. Regardless of how people feel and which emotion goals they pursue, people appear to be more satisfied when their current emotions are consistent with their emotion goals (Tamir et al., 2017). This could imply that pursuing attainable emotion goals is healthy, that successfully regulating emotions is beneficial, or that it is healthy to value the emotions one already experiences.

Additional Open Questions

Emotion goals are likely to have features that have not yet been studied. First, there may be a difference between the content and strength of emotion goals. Whereas the former captures what one wants to feel, the latter captures how much one wants to feel it. Although further research is needed, preliminary findings suggest that the content of emotion goals determines the direction of emotion regulation, whereas the strength with which they are pursued determines the degree of effort people invest to pursue them (Gutentag & Tamir, 2022). Second, like other goals, emotion goals may vary in

availability, accessibility, and salience. Availability refers to whether a particular emotion is considered desirable, accessibility refers to the extent to which an emotion goal readily comes to mind, and salience refers to its relative importance. Research on emotion goals is yet to examine these characteristics of emotion goals and their implications. Finally, to understand emotion regulation that occurs in social contexts, it is important to examine how emotion goals of different individuals interact, how they might be coordinated, and how this influences social functioning.

Summary

We are often carried by waves of emotion, and it is emotion goals that propel us to take control and sail toward a destination. These emotion goals can be general or temporary, and they determine whether we initiate emotion regulation, the direction we take, the strategies we select, and ultimately where we end up. No destination is perfect, including emotional destinations. Indeed, getting to an emotional destination we want to get to may be as important as wanting to be where we already are.

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CHAPTER 33

Emotion Regulation Flexibility

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PETER KOVAL

Our environment is in constant flux, and in response, our emotions change dynamically (Kuppens & Verduyn, 2017). Thus, when seeking to influence our emotions, we must also dynamically tune our emotion regulation efforts. This means that successful regulation does not involve merely using particular adaptive strategies but rather, flexibly picking the right strategy to suit ever-changing situational demands (Bonanno & Burton, 2013). This means that emotion regulation researchers must understand flexibility, often defined as systematic variation in emotion regulation processes in synchrony with the context (Aldao et al., 2015). In this chapter, we first discuss variability as a precursor to flexibility, then introduce the components of emotion regulation flexibility, and finally discuss challenges and future research directions.

Variability as a Precursor to Flexibility

Flexibility requires variable responding. Thus, to understand flexible emotion regulation researchers must study how emotion regulation varies across time. Emotion regulation variability can be separated into within- and between-strategy variability (Aldao et al., 2015). Within-strategy variability represents how the use of a single strategy varies across time (i.e., using a strategy more on some occasions than others). Between-strategy variability reflects differential use of all available strategies at a single time point (i.e., prioritizing some strategies over others on one occasion). A recent series of experience sampling studies found that between-strategy variability was associated with reduced negative affect, whereas within-strategy variability was not consistently associated with negative affect (Blanke et al., 2020). These modest and inconsistent relationships reflect a bigger issue: Although variability is a prerequisite for flexible responding, it is not synonymous with flexibility. As we outline in the following sections, variable emotion

regulation may reflect unsystematic or context-insensitive fluctuations, which do not constitute flexibility.

Components of Emotion Regulation Flexibility

Arguably the most influential model of emotion regulation flexibility was introduced by Bonanno and Burton (2013), who separated flexibility into *context sensitivity*, *repertoire*, and *responsiveness to feedback*. In the following paragraphs, we outline each process.

Context Sensitivity

Context sensitivity involves successfully reading contextual cues, and selecting a strategy that suits these cues (Aldao, 2013). To date, most research has focused on the latter aspect, often termed *strategy–situation fit*. Two instances of strategy–situation fit have been widely studied. First, reappraisal—a strategy involving changing one’s thoughts about an emotional event—has been investigated in relation to situational controllability. Researchers have posited that reappraisal should be less adaptive in tackling controllable stressors, where instead it might be best to change the situation itself (Troy et al., 2013). In line with this idea, studies have found that reappraisal in controllable situations was associated with reduced well-being, both in the lab (Troy et al., 2013) and in daily life (Haines et al., 2016).

Second, when emotional intensity is high, disengagement strategies may be useful to manage emotions before they gather force (Sheppes et al., 2011). In contrast, engagement strategies—which allow for full processing of emotion-eliciting stimuli—may be more effective at lower intensity. Regulation preferences follow this pattern: People show a relative preference for reappraisal (an engagement strategy) in low-intensity contexts, and for distraction (a disengagement strategy) in high-intensity contexts (Sheppes et al., 2011, 2014). This context-sensitive pattern of regulation has been linked to an attenuated association between trauma exposure and posttraumatic stress disorder (PTSD) symptoms among firefighters (Levy-Gigi et al., 2016)—however, a recent experience sampling study provides mixed support for these findings in daily life: Reappraisal was used more at low intensity, but distraction use did not covary with intensity, and both distraction and reappraisal were more effective at higher intensity (Blanke et al., 2022).

A less widely studied, but no less essential, component of context sensitivity is the ability to effectively read contextual cues. For example, one cannot select reappraisal to address an uncontrollable stressor without first being able to identify that the stressor is uncontrollable. The ability to read context cues has been linked with well-being—for example, the successful identification of context cues in stressful scenarios is linked with reduced psychopathology (Bonanno et al., 2020)—however, despite these findings, much of the research on strategy–situation fit overlooks the identification of context cues, and ignoring this vital step could muddy measures of strategy–situation fit (cf. Goodman et al., 2021). This also points to another issue in measures of context sensitivity: If a person has limited variability in their context (or appraisals of that context), they cannot demonstrate strategy–situation fit. This might explain why evidence for the adaptiveness of strategy–situation fit in daily life, where contextual features are often assessed subjectively, is less clear than in laboratory studies, where context can be manipulated.

In sum, in evaluating context sensitivity, it is important to consider (1) variability in context cues, (2) accurate identification of contextual variability, and (3) synchronization

of regulation efforts with variation in the context. We illustrate this point with Figure 33.1, which contains four different profiles of strategy–situation fit among reappraisal (strategy) and controllability (contextual cue). Panel A demonstrates high strategy–situation fit, where controllability and reappraisal are strongly negatively correlated, such that reappraisal use increases when controllability decreases. The other three panels demonstrate patterns that can masquerade as flexibility (or inflexibility) without a careful consideration of context. Panel B demonstrates context-insensitive variability: Here, reappraisal use is unrelated to variations in controllability. If within-strategy variability in reappraisal were examined without considering the context, it may be misinterpreted as flexibility. Panel C demonstrates strategy–situation misfit: Here, strategy use is misaligned with the context, such that reappraisal use increases at higher levels of controllability. Panel D demonstrates low variability in both reappraisal and controllability: Here, lack of variability in reappraisal could be mistaken for contextually insensitive responding, but this pattern may actually reflect appropriate regulation in a relatively invariable context.

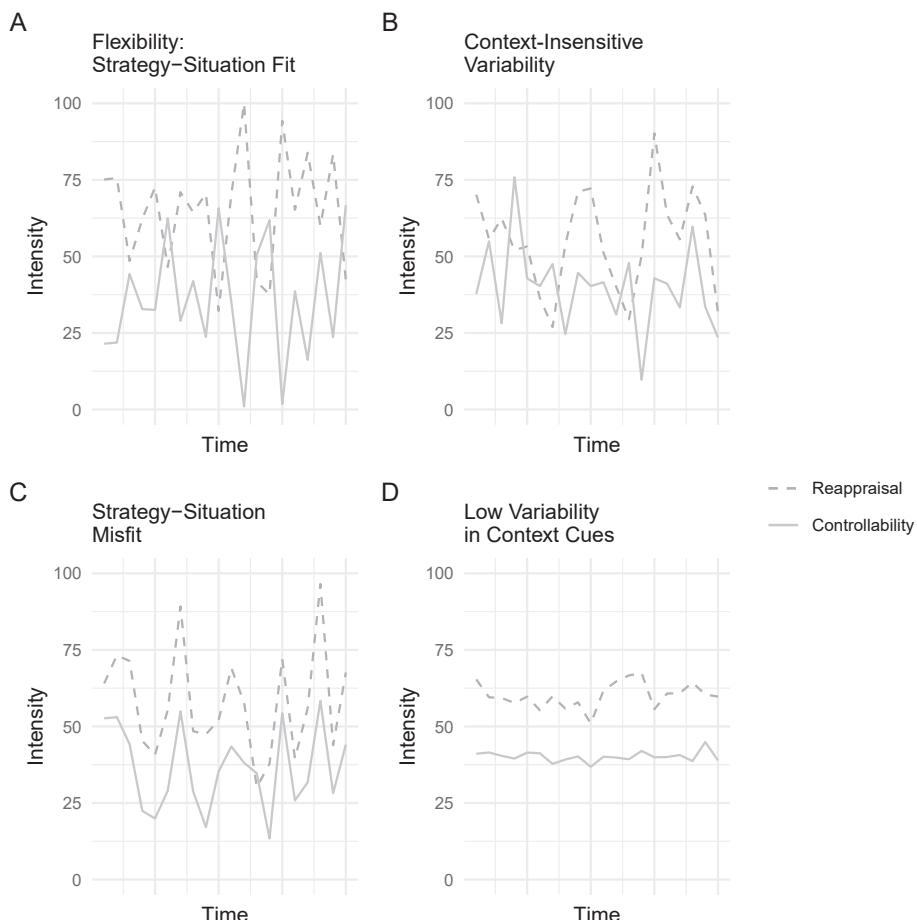


FIGURE 33.1. Examples of context-sensitive regulation (Panel A), context-insensitive regulation (Panels B and C), and lack of variability in context (Panel D).

Repertoire

Repertoire refers to the range of emotion regulation strategies in one's toolkit. Initial research focused on repertoire as the *ability* to use different strategies, and found that being able to both enhance and suppress emotional expression as instructed was linked to lower long-term distress (Bonanno et al., 2004).

More recent research on repertoire has focused primarily on quantifying the *size* and *composition* of the strategy set used by individuals. A larger repertoire is associated with positive outcomes—for example, the width of repertoire across vignettes was negatively associated with features of borderline personality disorder (although not depressive features; Southward et al., 2018)—however, when studied together, repertoire composition carries more weight than size alone (Grommisch et al., 2020), but what an ideal composition looks like is unclear. Some research suggests a varied repertoire of all strategy types is best. For example, one study found that habitually using putatively adaptive strategies was only negatively associated with psychopathology symptoms among people who also endorsed higher levels of maladaptive strategies (Aldao & Nolen-Hoeksema, 2012). This pattern could suggest that both adaptive and maladaptive strategies should form part of the repertoire—however, this pattern may also suggest that adaptive strategies reduce the costs of using maladaptive strategies, rather than maladaptive strategies being a useful addition. In line with this interpretation, other work suggests that maladaptive strategies may not be a necessary repertoire component. For example, in an experience-sampling study, wider repertoires focused on active regulation strategies (e.g., situation modification) were associated with greater well-being than wider repertoires focused on suppression/avoidance strategies (Grommisch et al., 2020).

Taken together, research suggests that certain repertoires might be beneficial, but what exactly such repertoires comprise remains unclear. This may be because repertoire is often assessed in a context-independent way—for example, by examining profiles of strategy use without mapping whether those strategies are deployed in a contextually sensitive way—and thus might be better termed *variability* than *flexibility*. To illustrate why incorporating context into measurement of repertoire is vital, consider the two hypothetical individuals in Figure 33.2: Both have the same repertoire size and deploy strategies at the same frequency—however, the individual in Panel A uses a wide repertoire in a context-sensitive way, deploying engagement strategies at low emotional intensity, and disengagement strategies at high intensity. In contrast, the person in Panel B deploys that same repertoire of strategies independently of emotional intensity. If context was not considered, we might say that both individuals are equally flexible in terms of their repertoire, because both are equally variable—however, Panel B demonstrates a diverse, but *not* flexible, repertoire because the variability in Panel B is not matched with the context.

Responsiveness to Feedback

The final component of flexible emotion regulation involves monitoring whether ongoing regulation efforts are achieving their intended goals, and maintaining, modifying, or switching strategies to maintain goal alignment (Sheppes, 2020). Feedback responsiveness is most often studied in terms of strategy switches. For instance, the ability to flexibly switch from a strategy with poor situation fit to a more suitable strategy was associated with higher well-being (Birk & Bonanno, 2016), and switching from reappraisal to distraction in high-intensity situations was associated with a larger late positive potential (Dorman Ilan et al., 2019). In line with these experiments, the self-reported ability to

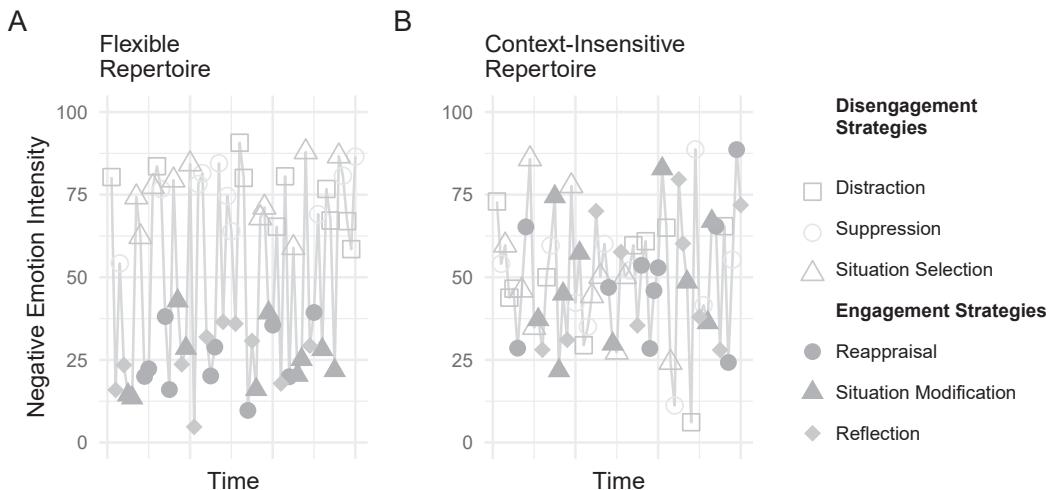


FIGURE 33.2. Examples of a flexible emotion regulation repertoire (Panel A) and a context-insensitive repertoire (Panel B).

switch from an ineffective strategy to an effective strategy was associated with psychological well-being (Kato, 2012)—however, sometimes switching can reflect regulation difficulties. For example, compared with healthy controls, individuals with schizophrenia demonstrated excessive strategy switching (Bartolomeo et al., 2022), and in a vignette study, more persistent strategy use was associated with lower levels of psychopathology (Southward et al., 2018).

As with repertoire, incorporating context is key to determining whether switches or persistence reflect effective regulation. For example, Figure 33.3 shows two hypothetical individuals who deploy regulation strategies (represented by shapes) following a large

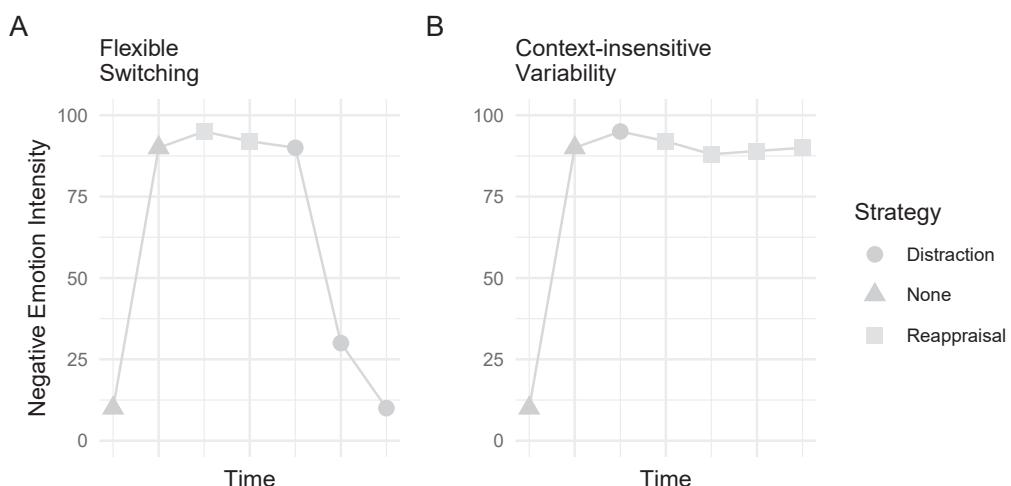


FIGURE 33.3. Examples of responsiveness to feedback reflected in flexible switching and persistence (Panel A) and context-insensitive switching and persistence (Panel B).

spike in negative emotional intensity (represented by lines)—in this situation, distraction is likely to be more effective than reappraisal (Sheppes et al., 2014). The person in Panel A begins using reappraisal, but quickly realizes this is ineffective and switches to distraction, which successfully down-regulates the negative emotion. In contrast, the person in Panel B begins with distraction but does not persist long enough to see this strategy bear fruit, instead switching to reappraisal. Because reappraisal is ineffective in this context, person B's negative emotion remains persistently high. Both individuals have one switch, but they represent vastly different decisions.

Challenges and Directions for Future Research

Research on flexibility is rapidly accumulating, and we have only scratched the surface of this burgeoning area. To make sure this growth is built upon secure foundations, we see a range of “integration” and “separation” challenges that should be addressed.

Integration

Integration across Flexibility Dimensions

Research rarely integrates across flexibility dimensions, but our review shows that integration is critical, particularly integrating context sensitivity with repertoire and responsiveness to feedback. Indeed, the few studies that have integrated across these dimensions have provided some evidence for the primacy of context sensitivity. For example, a study that assessed the three dimensions using self-report found that context-insensitive regulators showed more anxiety symptoms than those with narrow repertoire or low feedback responsiveness (Chen & Bonanno, 2021). Another study found that those high in context sensitivity benefited less from expressive flexibility, perhaps because context-sensitive regulators deployed effective strategies earlier in the regulation process (Southward & Cheavens, 2017). This research suggests that understanding the integrative links and dependencies between the three dimensions is an important next step in mapping flexible regulation.

Integration across Strategies

Repertoire explicitly considers multiple regulation strategies, but research on context-sensitive and feedback-responsive regulation often focuses on one or two strategies. Given that multiple emotion regulation strategies tend to be deployed simultaneously (Brans et al., 2013), we argue that a strong demonstration of strategy–situation fit requires showing a context-specific pattern with the target strategy, but not other strategies. Feedback-sensitive regulation would also benefit from considering multiple strategies. People often vary their use of strategies across an emotional episode (Kalokerinos et al., 2017), and so effective responses might involve complex blends and sequences of strategies (Ford et al., 2019).

Integration across Measures

A number of different measures of flexibility and variability have been proposed by researchers, including the within-person standard deviation (Blanke et al., 2020), entropy (Wen et al., 2021), inertia (Bean et al., 2021), and dominance (Bellingtier et al., 2022),

among others. An important next step is a full accounting of all measures, what they represent theoretically, and whether they contribute unique information (cf. Dejonckheere et al., 2019, for a similar investigation of affect dynamics). To demonstrate the added value of understanding flexibility, it is also important to quantify the strength of these measures relative to the main effects of strategy use, given that variability effects can be dwarfed by mean levels (Kalokerinos et al., 2020). Flexibility results will be most convincing when they can add meaningful variance above and beyond what we already know about (average) strategy use.

Integration across Contexts

One major challenge in this area is that there are many potentially important contextual features, and it is unclear which are most relevant to emotion regulation (Greenaway et al., 2018). The field would benefit from a big-picture framework outlining the most important features, or from drawing more explicitly from existing theoretical frameworks (e.g., appraisal theory; Scherer, 1999). Building our understanding of context on theoretical foundations helps to avoid a piecemeal choice of factors, and the potential Type 1 errors that could arise if only successful strategy–situation fit findings are published.

Separation

Separating Capacity from Tendency

Measures of capacity investigate whether people can flexibly regulate when instructed. This was the focus of early work, which demonstrated that the capacity to use even typically maladaptive strategies was predictive of well-being (Bonanno et al., 2004). More recent flexibility research focuses on spontaneous tendencies to regulate emotions flexibly, often using experience sampling (Koval & Kalokerinos, this volume). Researchers should not assume capacity is interchangeable with tendency—for example, the ability to use maladaptive strategies on instruction may be different from including those strategies in one's daily regulation repertoire.

Separating Flexibility from Instability

Research finds a small positive association between within-strategy variability and depressive symptoms (Blanke et al., 2020), suggesting that variability captures both instability and flexibility in responding. Mapping context is key to correctly separating these two concepts—however, in doing this, researchers should be careful to avoid patterns that look like context sensitivity (i.e., systematic variation in strategies aligned with contextual changes) but actually represent strategy–situation misfit because strategy use is not conducive to the regulator's goals (see Figure 33.1, Panel C).

Conclusions

Emotions are dynamic, which means that no true understanding of emotion regulation is possible without understanding emotion regulation flexibility. A rapidly expanding body of work demonstrates that successful emotion regulation is *flexible*: Successful regulation draws from a wide repertoire, is responsive to feedback, and above all, is context

sensitive. To continue building this work on a solid foundation, researchers need to integrate across flexibility dimensions, strategies, measures, and contexts, and to carefully separate capacity from tendency, and flexibility from instability.

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CHAPTER 34

Emotion Regulation and Resilience

WHEN IS REAPPRAISAL (NOT) CONDUCIVE TO RESILIENCE?

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Emotion regulation, which involves altering the level or nature of one's emotions, is necessary for humans to function in society and to maintain well-being (Gross, 2015). Perhaps nowhere is emotion regulation more important than when we encounter life's inevitable adversity, be it in the form of daily hassles, chronic adverse circumstances, stressful life events, or trauma (Folkman & Moskowitz, 2000; Troy & Mauss, 2011). Emotion regulation might help people feel better in the moment, and, over time, allow people to regain, maintain, or even increase psychological health after adversity, an outcome referred to as resilience (Bonanno et al., 2015).

Reappraisal—changing the way one thinks about emotional situations—might present a particularly effective avenue to regulating emotions because it transforms emotions at their root (Gross, 2015; Lazarus & Folkman, 1984). Take, for example, someone who is going through a divorce. This is often an adverse event, and yet, it can be construed in different ways. One might view it as an overpowering loss that will mark one's family for life. Alternatively, one might see it as something that is painful but that might lead to positive outcomes in the long run, such as improved relationships. As a result of these different construals, one might feel different emotions. The first construal may bring intense sadness and anger. The second construal might also bring sadness and anger but perhaps at lower levels. Crucially, it might also bring some positive emotions, such as hope, strength, or gratitude. This example illustrates how reappraisal might powerfully transform short-term emotional responses. When repeated over time, these short-term emotional consequences of reappraisal might accumulate to shape people's psychological health. Thereby, reappraisal might be a key to resilience.

Indeed, people who tend to use reappraisal more exhibit better psychological health, including in the context of adversity (Aldao et al., 2010; Gross & John, 2003; Troy

& Mauss, 2011). For example, correlational studies have found that reappraisal, measured with surveys, daily diaries, or laboratory assessments, predicts maintained or even increased psychological health following a wide variety of adverse events and circumstances and in a wide range of populations (Low et al., 2021; Moskowitz et al., 1996; Smith et al., 2021; Troy et al., 2010). This research might lead to the conclusion that we should all use reappraisal whenever we can.

However, the conclusion that *all* reappraisal is *always* conducive to resilience may be premature. After all, very few things in life are all good or all bad, and reappraisal is unlikely to be an exception (Cheng, 2001; Ford & Troy, 2019). The affect regulation framework for resilience (Troy et al., 2023) points to when and why there might be qualifications to reappraisal's links with resilience. Specifically, this framework argues that to understand when reappraisal is conducive to resilience we must consider (1) the emotional goals (i.e., the desired end states) of reappraisal and their associated profile of short-term consequences, and (2) the context within which reappraisal is used. Here, we examine qualifications that stem from these two aspects, illustrating each with one salient example (see Figure 34.1). First, we examine qualifications that stem from the goals of reappraisal. We ask, Is *all* reappraisal conducive to resilience, or are there some reappraisal goals that render it inert or even harmful? Second, we examine qualifications stemming from the context in which reappraisal is used. We ask, Is reappraisal *always* conducive to resilience, or are there some types of adversity when it might be inert or even harmful? We close with directions for future research.

Is All Reappraisal Conducive to Resilience?

Any conclusion about reappraisal *in general* is likely incomplete in that it leaves out important distinctions within the heterogeneous category of reappraisal. One fundamental

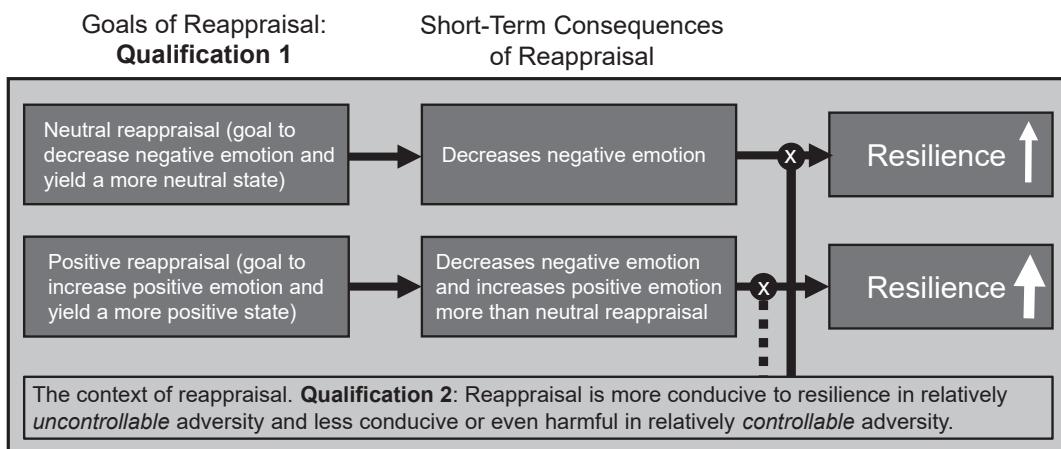


FIGURE 34.1. Qualifications to the reappraisal–resilience link stemming from the emotional goals of reappraisal (Qualification 1) and the context within which reappraisal is used (Qualification 2). The X symbols indicate moderation by context. The dashed line indicates that positive reappraisal may be less moderated by context than neutral reappraisal. The thicker up-arrow illustrates that positive reappraisal might be more conducive to resilience than neutral reappraisal.

distinction lies in the emotional goals of reappraisal. As indicated in Figure 34.1, reappraisal can be used to decrease negative emotion to yield a more neutral state (e.g., “This isn’t that bad”) or increase positive emotion to yield a more positive state (e.g., “This could have benefits”), with divergent implications for its short-term consequences for negative and positive emotions (McRae et al., 2012; McRae & Mauss, 2016; Shiota & Levenson, 2012). In turn, these divergent short-term consequences are potentially important for resilience in that positive emotions might have unique benefits when encountering adversity (Folkman & Moskowitz, 2000; Monroy et al., 2021; Tugade & Fredrickson, 2004).

Several experience sampling and daily diary studies support this distinction. For example, Brans and colleagues (2013) found that momentary reappraisal was associated with changes from one measurement point to the next in positive but not negative emotion. More recent research examined reappraisal specifically with regard to emotional responses to daily stressors (Troy et al., 2019). This research found that daily reappraisal predicted greater positive, as well as lower negative, emotions in response to daily stressors, but with larger effect sizes for positive emotions. Together, these studies suggest that people may use reappraisal to increase positive emotions more so than decreasing negative emotions, including in the context of adversity.

Experimental research that directly compared reappraisal aimed at decreasing negative emotion (“neutral reappraisal”) and reappraisal aimed at increasing positive emotion (“positive reappraisal”) also generally supports the relative advantage of positive reappraisal (McRae et al., 2012; Shiota & Levenson, 2012). For example, Duker and colleagues (2022) found that self-distancing, a form of neutral reappraisal, did not help people feel less negative or more positive emotion after recalling a stressful experience with sexism. In contrast, benefit finding, a form of positive reappraisal, helped participants feel less negative and more positive emotion. Similarly, Rompilla and colleagues (2022) found that in older adults who viewed sad film clips depicting loss, positive versus neutral reappraisal led to comparable decreases in negative emotions but greater increases in positive emotions. These results point to a potential advantage of positive reappraisal when it comes to short-term emotional experiences, with positive reappraisal generally leading to lesser or comparable negative emotion and greater positive emotion.

Going beyond short-term emotional experiences, and distinguishing positive from neutral reappraisal, Nezlek and Kuppens (2008) found that daily positive reappraisal was positively associated with daily well-being, whereas daily neutral reappraisal was not. Importantly, the relationship between positive reappraisal and well-being was mediated by positive emotions.

In a recent study, we examined whether the short-term consequences of reappraisal on positive versus negative emotion might extend to and potentially play a role in longer-term psychological health. To do so, we measured habitual reappraisal in community participants and, 6 months later, psychological health. To capture reappraisal’s short-term emotional consequences, we administered daily diaries that measured positive and negative emotional responses to daily stressors. Reappraisal was associated with greater psychological health, and this link was accounted for by positive (but not negative) emotions experienced in response to daily stressors (Ford et al., in preparation). Taken together, this research suggests that reappraisal that increases positive emotions (vs. decreasing negative emotions) might be particularly conducive to resilience, as indicated by the thicker up-arrow in Figure 34.1.

Why might positive reappraisal be more robustly associated with resilience than neutral reappraisal? While we currently do not have empirical data that directly address this question, one possibility is that positive emotions have distinct benefits, especially

in the context of adversity, including “undoing” negative emotion, building social connection, and motivating people to take action (Folkman & Moskowitz, 2000; Tugade & Fredrickson, 2004). In contrast, decreasing one’s negative emotion—while feeling better in the moment—might come with some downsides, including feelings of inauthenticity and sapping people’s motivation for action (Ford & Troy, 2019).

Is Reappraisal Always Conducive to Resilience?

The research we have described so far examines reappraisal as an individual-level factor. Yet, how beneficial a particular individual-level factor is may crucially depend on its context, as illustrated by the moderation symbols (X) in Figure 34.1. The controllability of adversity is a particularly fundamental context feature because it determines whether it is more useful to regulate one’s emotions versus one’s situation (Cheng, 2001; Troy et al., 2013). When adversity is relatively uncontrollable (e.g., bereavement), reappraisal may be beneficial because it helps us feel better, and there is little we can change about the situation. In contrast, when adversity is relatively controllable (e.g., a disagreement with a friend), reappraisal may be useless or even harmful because, while it may help us feel better, it takes away resources and motivation from efforts to change one’s situation for the better.

Consistent with this notion, we have shown that the positive effects of reappraisal success depend on the controllability of adversity. Greater reappraisal success was associated with lower levels of depression when participants’ recent life stressors were relatively uncontrollable. When adversity was relatively controllable, however, reappraisal success was associated with *higher* levels of depression, including when adjusting for stressor severity (Troy et al., 2013). We extended this model to people who tend to systematically face relatively uncontrollable adversity: people of lower socioeconomic status (SES). Across three studies, they benefited significantly more from reappraisal than those of higher SES (Troy et al., 2017).

Given that reappraisal appears to be more beneficial in relatively uncontrollable contexts, people who use reappraisal more in uncontrollable (vs. controllable) contexts (i.e., who have good reappraisal–context fit) should have better psychological health. A study by Haines and colleagues (2016) tested this hypothesis by measuring reappraisal–context fit as the within-person association between reappraisal use and the perceived controllability of situations in daily life. They found that participants with better reappraisal–context fit had greater psychological health, consistent with the idea that reappraisal is more conducive to resilience in relatively uncontrollable (vs. controllable) adversity.

Why might reappraisal lead to fewer benefits or even to harm in the context of relatively controllable adversity? One possibility is that reappraisal helps people feel better in the moment, but feeling better saps the motivation to change their situation for the better, efforts that could be successful for more controllable stressors. To begin testing this idea, we examined Clinton voters after the 2016 U.S. election, measuring and manipulating their reappraisal use with regard to Trump-related content. Across studies, we found that reappraisal predicted less political action, and that this effect was mediated by lower negative emotion (Ford, Feinberg, et al., 2019). These findings suggest that reappraisal may be costly in the longer run by decreasing people’s attempts to behaviorally engage with and change adverse contexts. When those contexts are controllable, it might be better to attempt to effect change.

A recent study, conducted during the COVID-19 pandemic, brings together these ideas with the distinction of positive and neutral reappraisal (Smith et al., 2021). The study found that greater self-reported reappraisal success predicted reduced fear about COVID-19 and better psychological health. Yet, to the extent reappraisal success predicted reduced fear, it also predicted fewer health behaviors, such as mask wearing. This is consistent with the idea that decreased negative emotions may disrupt attempts to change one's situation (in this case, protecting oneself and others). Second, greater reappraisal success also predicted socially engaged positive emotions, such as gratitude and inspiration. Positive emotions, in turn, predicted better psychological health but at the same time *more* health behaviors. This is consistent with the idea that increased positive emotions might benefit short-term emotional consequences and longer-term psychological health, without disrupting a person's attempts to make needed and possible changes to their situation. In fact, positive emotions might motivate people to engage, seek support, and make changes.

This idea is consistent with earlier research on meaning making, a form of positive reappraisal (e.g., appreciating what one learned from adversity). This research found, for example, that meaning making was associated with less depressed mood in HIV-positive men and their caregivers regardless of perceived controllability, whereas neutral reappraisal was less strongly associated with depressed mood, especially when adversity was perceived as more controllable (Park et al., 2001). On the whole, then, perhaps both qualifications can be considered together: positive (compared to neutral) reappraisal might be more conducive to resilience because its profile of short-term emotional consequences is advantageous (Qualification 1), which, in turn, may make it more useful across multiple types of adversity (e.g., regardless of controllability, Qualification 2), as indicated by the dashed line in Figure 34.1.

Future Directions

In closing, we discuss key directions for future research on emotion regulation and resilience.

Deepening and Broadening Our Understanding of Affect Regulation Processes

Here, we focused on one particularly fundamental distinction within reappraisal, and it is important to examine other distinctions in future research, such as among appraisal tactics (e.g., changing how a situation is interpreted vs. changing the goals to which one compares the situation; McRae et al., 2012; Uusberg et al., 2019). Similarly, we need to make further distinctions within other emotion regulation strategies, such as suppression (Young et al., 2022). In addition to making distinctions *within* emotion regulation strategies, we need to broaden our understanding by examining relationships among multiple emotion regulation strategies (Ford, Gross, et al., 2019; Shallcross et al., 2015).

More Deeply Considering the Context

We focused here on controllability of adversity as a particularly salient context feature. Other features of adversity also need to be considered, including intensity, timing, duration, globality, threat, deprivation, and event type (Epel et al., 2018). Beyond features of

adversity, the broader context matters as well. The broader context is shaped by a person's culture, society, community, family, and social group (e.g., based on race, gender, age, or SES), and the affordances, practices, values, and beliefs they engender (Troy et al., 2023). The broader context is relevant to resilience in that it powerfully influences the adversity people experience, emotion regulation, the short-term consequences of emotion regulation, and their implications for resilience. Some research has examined the role of the broader context in emotion regulation and resilience (Ford & Troy, 2019; Juang et al., 2016), but given its profound influence, much more can be learned.

Resilience Outcomes

Our review focused on psychological health as the indicator of resilience. In future research, it will be important to better understand the degree to which emotion regulation has general versus specific effects on different facets of psychological health, distinguishing, for instance, anxiety from depression or hedonic from eudaimonic well-being. As well, resilience doesn't just involve psychological but also social and physical functioning, and a major direction for research is to investigate the social and physical health aspects of resilience. Initial research indicates there might be tradeoffs, such that emotion regulation processes that are helpful in one domain might not be in other domains (Smith et al., 2021).

Concluding Comment

Perhaps nowhere is emotion regulation more important than when we encounter adversity, for better—when it helps people be resilient—or for worse—when it fails. Here we considered reappraisal, which is particularly consequential in shaping resilience. Recent research indicates that there are important nuances in reappraisal and its context that qualify reappraisal's role in resilience. More broadly, any particular emotion regulation strategy likely isn't all good or all bad, and cannot be understood without considering the contexts in which it is embedded. These insights deepen our understanding of emotion regulation and resilience, ultimately informing how we help people, systems, and societies become more resilient.

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SECTION VIII

PSYCHOPATHOLOGY

General Considerations

CHAPTER 35

Emotion Regulation as a Transdiagnostic Process

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Recent research has shown that alterations in emotion regulation (ER) are associated with many different mental disorders, such as depression, alcohol use disorder, and personality disorders. Because of the apparent ubiquity of alterations in ER in psychopathology, it has been proposed that ER should be considered as a transdiagnostic process (Aldao et al., 2010). In this chapter, we present a concept of transdiagnostic processes, as well as concepts of ER, evaluate evidence for ER as a transdiagnostic process, and discusses future research avenues.

What Is a Transdiagnostic Process?

Since the 1980s, clinical psychology research has almost exclusively relied on disorder-specific approaches that are based on the classification of mental disorders into certain categories (i.e., diagnoses)—however, there are considerable disadvantages to this classification. For example, it cannot account for the high comorbidity rates between mental disorders (Kessler et al., 2005). More recently, the transdiagnostic perspective, which focuses on processes that may be relevant in the development or maintenance for several disorders, has become popular as an alternative to disorder-specific approaches.

There is no universally accepted definition of the term *transdiagnostic*. Several conceptualizations exist as to what can be defined as a transdiagnostic process (e.g., National Institute of Mental Health, 2022; Nolen-Hoeksema & Watkins, 2011), including a definition put forward by Harvey et al. (2004). These authors argue that a process should meet two criteria to be identified as transdiagnostic:

1. The process must be present across (at least four) different mental disorders.
2. The process must be causally involved in the development and/or maintenance of mental disorders, instead of representing a mere epiphenomenon.

What Is ER?

ER is typically defined as “the process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (Gross, 1998, p. 275). This also includes the duration or magnitude of the emotion, as well as the experiential, physiological, or behavioral responses related to the emotion (Gross, 1998). This definition shows that ER is a complex phenomenon comprising many different aspects and processes. In the following, we focus on two theoretical models of ER that can be used to examine the transdiagnostic role of ER in psychopathology.

Arguably the most foundational model in the field is the process model of ER (Gross, 2015). Gross (2015) suggests that ER strategies can best be distinguished regarding the points in the emotion-generative process they are targeting. Based on this model, all ER strategies can be helpful or not, depending on the context. However, it has been proposed that some strategies can be considered as *generally* (i.e., across various regularly encountered contexts) more adaptive (e.g., reappraisal), whereas others are considered as generally less adaptive (e.g., rumination, suppression).¹ For the purpose of readability, we refer to those strategies that are considered as generally more helpful as adaptive strategies and to those that are generally less helpful as maladaptive strategies. A specific hypothesis derived from the model is that individuals suffering from mental disorders use adaptive strategies less frequently than maladaptive strategies and/or are less effective in using adaptive strategies compared to healthy individuals.

Gratz and Roemer (2004) have proposed a model of ER in relation to psychopathology. Instead of focusing on specific strategies, the model defines broad ER abilities that are related to how someone copes with emotional distress. Specifically, ER is defined as a multidimensional construct that includes various ER abilities. Those ER abilities are being aware of, understanding, and accepting emotions; being able to engage in goal-directed behaviors and to control impulsive behaviors when experiencing negative emotions; being able to flexibly use strategies that are appropriate in a certain situation to modulate the intensity and duration of an emotion; and being willing to experience negative emotions in the pursuit of desired goals. Based on this model, deficits in ER abilities are assumed to be indicative of ER difficulties, which are associated with mental disorders.

Evidence for ER as a Transdiagnostic Process

In the next section, we use Harvey et al.’s (2004) definition to examine the evidence for ER as a transdiagnostic process. First, we assess whether it is associated with at least four disorders. Second, we review whether it plays a causal role in the development and/or maintenance of several disorders. Furthermore, we show some evidence from prospective studies.

¹More information on ER strategies can be found in Uusberg and Uusberg (this volume) on reappraisal, English (this volume) on expressive suppression, and Watkins (this volume) on rumination.

In recent years, eight meta-analyses have been published examining cross-sectional associations between the use of ER and specific mental disorders. They summarize results of specific ER strategies (Gross, 2015) and ER abilities (Gratz & Roemer, 2004) that have received substantial research attention in the past years. Table 35.1 provides an overview of the results on two maladaptive ER strategies (rumination and suppression) and one adaptive ER strategy (reappraisal), as well as on the ER abilities of emotional awareness, emotional clarity, and acceptance.² As can be seen in the table, the majority of mental disorders are associated with higher use of maladaptive and lower use of adaptive ER strategies. Similarly, there is evidence that patients with various mental disorders have greater deficits in ER abilities compared to healthy individuals. Taken together, it can be concluded that for both ER strategies and ER abilities the first criterion for ER as a transdiagnostic process according to the definitions by Harvey et al. (2004) is clearly met.

Whereas the literature on cross-sectional associations between ER and symptoms of mental disorder is quite extensive, there are far fewer studies using prospective or experimental designs. Based on (systematic) reviews, prospective studies have generally shown (with some exceptions) that a higher frequency of using reappraisal predicts lower levels of symptomatology across various mental disorders (Cludius et al., 2020), whereas a higher use of rumination predicts higher levels of symptomatology (Ehring & Behar, 2021). Similarly, suppression positively predicts symptoms of social anxiety, whereas results on depression have been quite mixed (Dryman & Heimberg, 2018). In several longitudinal studies, difficulties in ER abilities, according to the Gratz and Roemer (2004) model, predicted symptoms of various mental disorders (Lincoln et al., 2022). Taken together there is evidence for various mental disorders that alterations in ER precede symptomatology. Even though prospective studies show whether alterations in ER precede symptom onset (or exacerbations), they are still correlational designs, as it is possible that changes in both ER and symptoms are due to a third variable (Van Den Hout et al., 2017).

Therefore, to test Harvey et al.'s (2004) second criterion—namely, whether ER is causal for the development or maintenance of mental disorders—we need experimental studies including laboratory and treatment studies (see Stanov & Ochsner, this volume, for an overview of experimental methods). Those studies can inform us about causality, as the ER strategy is directly manipulated to assess its effect on (markers of) psychopathology. Notably, in recent years methods to test causality based on purely observational data—for example, by using graphical causal models—have been suggested as an alternative in cases where experimental manipulation is not possible (e.g., Rohrer, 2018). However, to our knowledge, no studies using this method in the context of ER as a transdiagnostic process have been published. In the following, we show some results of experimental studies.

In lab-based experimental studies, the instruction to use reappraisal has been found to reduce anxiety, disgust, sadness, and anger when compared with no instruction or instructions to use other ER strategies (see Cludius et al., 2020, for an overview). Additionally, reappraisal has been shown to lead to reductions in negative mood in participants with remitted depression (Ehring et al., 2010) and to reductions in depressive symptoms in individuals with current depression (Diedrich et al., 2014). There is evidence that induced rumination leads to the maintenance of negative mood and other cognitive, interpersonal, and physiological changes related to psychopathology (Ehring & Behar, 2021). Whereas the instruction to use suppression has been shown to lead to higher levels of negative mood compared to reappraisal in healthy participants and participants with remitted depression

²Note that acceptance has also been discussed as an ER strategy.

TABLE 35.1. Overview of Results from Recent Meta-Analyses on Positive Associations, Negative Associations, or Nonsignificant Associations between Mental Disorders and ER Strategies or ER Abilities

Disorder	Author (year)	ER strategies			ER abilities		
		Suppression	Rumination	Reappraisal	Emotional awareness	Emotional clarity	Acceptance
Anorexia nervosa	Prefit et al. (2019)	Positive	Positive	Negative	Negative	Negative	Negative
Bulimia nervosa	Prefit et al. (2019)	Positive	Positive	Negative	Negative	Negative	Negative
Current depression	Visted et al. (2018)	Positive	Positive	Negative	Negative	Negative	Negative
Remitted depression	Visted et al. (2018)	Positive	Positive	Not significant	—	—	Negative
Depressive symptoms (adolescents)	Schäfer et al. (2017)	Positive	Positive	Negative	—	—	Negative
Anxiety symptoms (adolescents)	Schäfer et al. (2017)	Positive	Positive	Negative	—	—	Negative
Posttraumatic stress disorder	Seligowski et al. (2015)	Positive	Positive	Not significant	—	—	Not significant
Psychosis	Ludwig et al. (2019)	Positive	Positive	Negative	—	—	Not significant
Borderline personality disorder	Daros & Williams (2019)	Positive	Positive	Negative	—	—	Negative
Alcohol use disorder	Weiss et al. (2022)	Not significant	—	Negative	Negative	Negative	Negative
Substance use disorders	Weiss et al. (2022)	Not significant	—	Not significant	Negative	Negative	Negative

Note.—, no data on this ER strategy or ER ability was available in the meta-analysis.

(Ehring et al., 2010), it has been found to reduce distress and the urge to engage in self-injury in patients with borderline personality disorder when compared to the instructions to use acceptance or no instructions (see Daros & Williams, 2019, for an overview).

Treatment studies subsume both lab-based intervention studies and psychotherapy studies in which ER is specifically targeted. Trainings of ER strategies in subclinical and patient samples have been shown to often be effective in reducing symptomatology in the lab, but results have not been fully consistent. For example, after a short training of reappraisal in the lab, participants high in contamination fears were better at reducing their emotion of disgust compared to participants who had received no training (Olataunji et al., 2017). Similar results were found for patients with obsessive-compulsive disorders (Fink et al., 2018). Whereas reappraisal training has been found to be effective in participants high in social anxiety, some research suggests that a brief training in reappraisal may be insufficient for individuals with more severe symptoms of social anxiety disorder (see Dryman & Heimberg, 2018, for an overview).

Interventions that target rumination have been shown to reduce symptomatology of several disorders, with some evidence showing that this effect is mediated by a reduction in rumination (Ehring & Behar, 2021). Treatment studies in clinical samples that have assessed interventions that were designed to improve ER more generally (e.g., see Kuo, this volume, for an overview of dialectical behavior therapy or Mennin & Fresco, this volume, for more information on interventions targeting ER) have shown that these interventions have been largely effective at improving both ER and symptoms of psychopathology, but there is only tentative evidence that improvement in ER mediates symptomatic improvement (see Lincoln et al., 2022, for an overview). Thus, those studies are still mostly lacking evidence on the causality of ER as a transdiagnostic process.

In conclusion, experimental studies are still rather scarce and the results of those studies are not fully consistent. Therefore, it cannot be concluded (yet) that ER is causal for the development and/or maintenance of psychopathology (second criterion for a transdiagnostic process according to Harvey et al., 2004). This means that whereas alterations in ER strategies and deficits in ER abilities are clearly associated with different types of psychopathology, there is only little evidence (so far) that ER in general can be considered a transdiagnostic process as evidence regarding the causality of the relationship is scarce and mixed, with only a few exceptions (e.g., a more consistent body of evidence for rumination as a dysfunctional ER strategy).

Open Questions and Future Directions for Research on ER as a Transdiagnostic Process

As the vast majority of studies to date has assessed cross-sectional associations between ER and symptoms of mental disorders, future research should focus on prospective studies and especially on experimental studies to establish causality of ER for psychopathology. We have recently proposed a framework for translational research that could serve as a foundation when systematically planning studies to assess ER as a transdiagnostic process, including design issues in experimental psychopathology research and treatment studies (Ehring et al., 2022). Future studies should also include variables that may serve as a third variable, possibly explaining both changes in ER and symptoms—for example, cognitive control (Pruessner et al., 2020). Developing and systematically testing graphical causal models (Rohrer, 2018) ideally containing all potentially relevant causal factors also appears promising.

Theoretical models currently used as the basis for research into the role of ER in psychopathology (e.g., Gratz & Roemer, 2004; Gross, 2015) have without any doubt been fruitful as frameworks for research in this area—however, they appear to be underspecified regarding the exact mechanisms by which ER problems maintain psychopathology and how ER is linked to other emotion-related processes (Nowak et al., 2021). As an exhaustive discussion of important theoretical developments is beyond the scope of this chapter, we focus on two important issues where further theoretical development, as well as systematic empirical testing, appears necessary.

First, research findings into the link between ER and psychopathology have not been entirely consistent between disorders (see Table 35.1), or even within disorders (e.g., Ludwig et al., 2019). This may indicate that there are important moderators of the link between certain ER strategies and psychopathology. Those moderators could potentially include the type and intensity of the emotion (e.g., Coleman & Oliveros, 2020), the appraisal of emotions and of regulation strategies (Kneeland et al., 2016), and the costs of specific strategies (i.e., how “easy” it is for someone to implement a certain strategy; Troy et al., 2018). Models on ER and psychopathology should be refined by hypothesizing under which conditions or in which context certain ER strategies may be maladaptive or dysfunctional and lead to more psychopathology.

Second, transdiagnostic aspects of ER can be regarded as only one side of the coin. In addition, it appears likely that future research will uncover both aspects of ER that are transdiagnostic processes, as well as disorder-specific alterations in ER. As highlighted by Nolen-Hoeksema and Watkins (2011), transdiagnostic models need to specify the mechanisms by which a transdiagnostic process serves as a risk factor for specific mental disorders (i.e., multifinality) between individuals and even within individuals over time.

Conclusion

To conclude, alterations in ER can be found across various mental disorders—however, the causal influence of ER for the development and maintenance of mental disorders is still understudied and the results have been mixed. Thus, it remains to be known whether indeed ER is a transdiagnostic process. In addition, the field would benefit from further theoretical development specifying moderators of the effects of ER on psychopathology and accounting for the interplay between transdiagnostic and disorder-specific aspects of ER.

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CHAPTER 36

Emotion Goals and Mental Health

YAEL MILLGRAM

Emotion regulation deficits contribute to many mental health disorders (Berking & Wupperman, 2012). Most research sought to understand these deficits by investigating *how* people regulate emotions; specifically, which emotion regulation strategies people use and how they implement them—however, emotion regulation strategies are used at the service of attaining desired emotional states (emotion goals; Tamir & Hu, this volume). Therefore, people who struggle with psychopathology might differ not only in the strategies they use but also in the emotional states they desire. In this chapter, I review evidence suggesting that emotion goals could be an important missing piece for understanding emotion regulation deficits and mental health. I focus on three complementary questions: (1) Do clinical populations differ from nonclinical populations in their emotion goals?, (2) What are the implications of these differences?, and (3) What could underlie them?

I begin by describing emotion goals and how they might impact mental health. I then review evidence for differential emotion goals in clinical populations, the downstream implications of these differences, and discuss potential explanations for why these differences might emerge. Finally, I highlight key future directions for research on this topic.

Emotion Goals

Emotion goals are the emotional states people try to attain when regulating emotions (Gross, 2015; Tamir, 2021). For instance, people can regulate emotions to feel happier or less anxious. Emotion goals can determine whether people initiate emotion regulation, which emotion regulation strategies they use, and the emotional experiences that follow (Tamir, 2016). For instance, people who were motivated to decrease sadness were more

likely to use strategies that decrease sadness (Millgram, Sheppes, et al., 2019), and ultimately felt less sad as a result (Tamir et al., 2019).

Although most people want to feel pleasant emotions and avoid unpleasant emotions, people vary in how much they want to experience various emotional states (Riediger et al., 2009). This variation in emotion goals can carry implications for mental health by shaping emotion regulation and emotional experience.

Many psychiatric disorders involve dysfunctional emotional experiences and the use of less effective emotion regulation strategies (Cludius et al., 2020). To the extent that people who struggle with these disorders pursue different emotion goals, such goals can partly shape their strategy choices and as a result, the intensity or frequency of subsequent emotional states. These emotional states, in turn, can affect their mental health (see Figure 36.1). Understanding whether clinical populations differ from nonclinical populations in their emotion goals is, therefore, the first step toward uncovering the role emotion goals could play in mental health disorders.

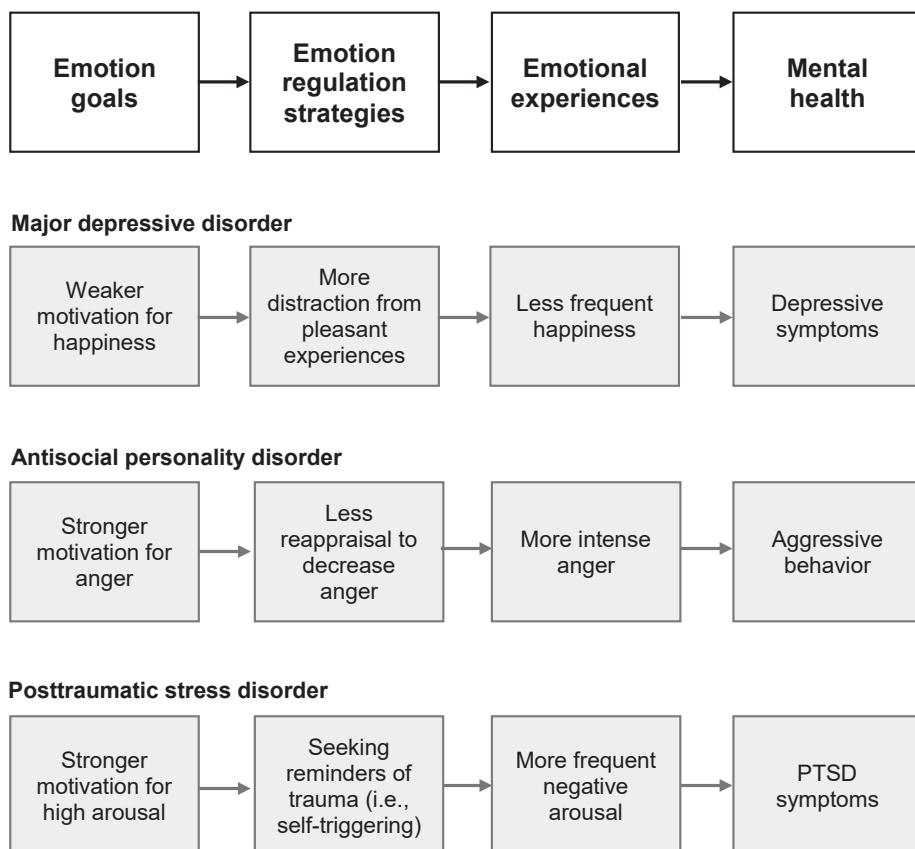


FIGURE 36.1. The path from emotion goals to mental health. Emotion goals shape the use of emotion regulation strategies and emotional experiences, which, in turn, can shape mental health. The figure includes hypothetical examples pertaining to three mental health disorders.

Do Clinical and Nonclinical Populations Differ in Their Emotion Goals?

. . . I still feel, from time to time, that I need to feel that sadness again, like it would stir something in me that shouldn't be asleep. Maybe I'm just bored, I don't know, but I caught myself, more than once, doing my best to feel the worst I can.

—POSTED ON REDDIT (November 2, 2013)

In recent years, research on emotion goals in clinical populations has been accumulating. This research suggests that compared to nonclinical populations, in certain psychiatric disorders people are more motivated to experience emotions that are consistent with the emotional patterns characterizing their disorder.

Mood Disorders

Most research on emotion goals in clinical populations focused on major depressive disorder. Depression involves elevated unpleasant emotions, like sadness, and diminished pleasant emotions, like happiness (Mata et al., 2012). Could depressed individuals differ from nondepressed in their goals to experience sadness and happiness? To begin answering this question, in one investigation (Millgram et al., 2015), depressed and nondepressed participants directly rated the extent to which they wanted to feel sad and happy. To assess emotion goals behaviorally, participants also chose whether to expose or not to expose themselves to stimuli that induce sadness or happiness. Although both groups wanted to feel more happy than sad, depressed participants reported greater motivation for sadness and lower motivation for happiness, compared to nondepressed. Depressed individuals were also more likely than nondepressed to expose themselves to sadness-inducing images, and preferred listening to sad over happy and neutral music, even while explicitly acknowledging that it would make them feel sad. In another study, depressed and nondepressed individuals were given a choice to use an effective strategy (i.e., cognitive reappraisal) to either amplify or decrease emotional reactions to sad and happy images. Depressed individuals were almost twice as likely as nondepressed to choose to amplify reactions to sad images (Millgram et al., 2015). These choices could not be explained by invested effort, emotional inertia, or perceived regulation ability. These findings have since been replicated in other studies (Arens & Stangier, 2020; Millgram, Joormann, et al., 2019; Mizrahi Lakan, Millgram, & Tamir, 2022; Yoon et al., 2020).

Findings were also extended to more ecologically valid settings. Using ecological momentary assessments (EMAs), we found that depressed (vs. nondepressed) participants wanted to feel sadness to a greater degree and happiness to a lesser degree in daily life (Mizrahi et al., 2023). They were also less likely to prefer happy over sad music to listen to in daily life (Yoon & Rottenberg, 2021).

Studies also pointed to the importance of assessing goals pertaining to broader affective states (i.e., valence and arousal) in depression. Yoon and colleagues (2020) suggested that depressed individuals may seek low-arousal affective states (e.g., calmness) rather than sadness per se. Indeed, depressed individuals preferred listening to low-arousal, but not high-arousal, sad music over high-arousal happy music (Yoon et al., 2020)—however, in the same study, depressed individuals also preferred low-arousal sad music over low-arousal happy music (Yoon et al., 2020), indicating that their preferences could not be accounted for by arousal alone. In another study, whereas depressed individuals' music choices reflected preferences for low arousal (sad and calm music), their self-reported

emotion goals reflected preferences for negative valence (i.e., sadness and fear/anxiety; Mizrahi Lakan, Millgram, & Tamir, 2022). Together, these findings suggest that emotion goals in depression could reflect preferences for both negative valence and low arousal.

Are emotion goals in depression characteristic of depression, in particular, or do they characterize mood disorders more generally? This was first addressed by examining emotion goals in a different mood disorder—namely, bipolar disorder. Bipolar disorder involves mood fluctuations between episodes of depression, episodes of mania, and mixed episodes (Townsend & Altshuler, 2012). Like people diagnosed with unipolar depression, people at high risk for, and people diagnosed with bipolar disorder were more likely than controls to choose to expose themselves to sadness-inducing stimuli and avoid happiness-inducing stimuli (Millgram et al., 2021)—however, consistent with the mood fluctuations characterizing bipolar disorder, people at risk for bipolar disorder reported stronger motivation for emotional fluctuations and preferred to experience them at a higher frequency compared to low-risk individuals. These findings suggest that mood disorders share certain patterns of emotion goals, but also might exhibit disorder-specific patterns.

Anxiety and Symptoms of Posttraumatic Stress Disorder

Are differential patterns of emotion goals evident only in mood disorders? Or do they extend to other disorders, including ones that typically involve emotional avoidance? These questions were the focus of recent studies assessing emotion goals in people with elevated anxiety or symptoms of posttraumatic stress disorder (PTSD). In one cross-sectional study, elevated anxiety symptoms were associated with greater motivation for high-arousal positive (e.g., excitement) and negative (e.g., fear) emotions (Swerdlow et al., 2019). Replicating and extending these findings, Vanderlind et al. (2022) conducted a 14-day EMA study and found that people higher (vs. lower) in trait anxiety or anxiety symptom severity reported greater motivation for anxiety, but not sadness, in daily life. With regard to PTSD symptoms, a study conducted among trauma survivors found that up to 74.1% of participants engaged at least once in “self-triggering,” which involves actively seeking reminders of trauma (e.g., watching trauma-related videos). Interestingly, some people reported engaging in self-triggering in order to experience emotional distress rather than despite it being distressing (Bellet et al., 2020). Together, these findings suggest that people with elevated anxiety might sometimes seek the very emotional states characterizing their symptoms.

Personality Disorders

Dysfunctional emotional patterns can be found not only in affective disorders but also in some personality disorders. For instance, people with borderline personality disorder can experience intense anger that partly impairs cooperation with others (Lis & Bohus, 2013). In line with these findings, people with borderline personality disorder reported wanting to experience less happiness during cooperation, and greater anger during confrontation compared to controls (López-Pérez & McCagh, 2020). This underscores the potential role of emotion goals in undermining cooperation in this disorder.

Another personality disorder characterized by difficulties in controlling emotions is antisocial personality disorder (Verona et al., 2012). People with this disorder tend to experience more frequent other-directed negative emotions, like anger (Garofalo et al., 2021). Consistent with this emotional pattern, psychopathic traits were associated with

greater motivation for negative emotions, particularly anger (Spantidaki Kyriazi et al., 2021). Decreased aversion to anger might contribute to some aggressive behaviors common in psychopathy.

What Are the Implications of Different Emotion Goals in Clinical Populations?

Given evidence that certain clinical populations differ in their emotion goals, a key question is whether these differences carry implications for the use of specific emotion regulation strategies, emotional experiences, and mental health.

With regard to emotion regulation strategies, one study manipulated emotion goals to test their impact on strategy choices in depression (Millgram et al., 2023). In one condition, participants spontaneously chose between a strategy that decreases emotional intensity (i.e., distraction) and a strategy that increases it (i.e., rumination), in response to pleasant and unpleasant memories. In the second condition, emotion goals were manipulated by instructing participants to choose the option that would make them feel better. Depressed individuals were more likely than nondepressed to spontaneously choose distraction in response to pleasant memories, resulting in reductions in positive affect—but, when the goal to feel better was activated, depressed individuals' strategy choices were identical to those of nondepressed. This suggests that emotion goals might partially shape depressed individuals' choices of some emotion regulation strategies. Furthermore, in an EMA study, depressed individuals were more likely than nondepressed to distract from pleasant emotions in daily life. This pattern of strategy use, in turn, was related to a stronger motivation for unpleasant emotions (Millgram et al., 2023).

With regard to emotional experiences, several studies tested whether emotion goals in clinical populations shape or predict subsequent emotional states. For instance, depressed individuals' choices to increase emotional reactions to sad images resulted in elevated sadness (Millgram et al., 2015). Similarly, choices of depressed participants to listen to sad over happy music in daily life resulted in reduced happiness, although also in increased relaxation (Yoon et al., 2020). Finally, for people high in trait anxiety (but not anxiety symptom severity), greater motivation for anxiety predicted increases in anxiety from one time point to the next in an EMA study (Vanderlind et al., 2022).

With regard to mental health, cross-sectionally, McGhie et al. (2022) found that trauma survivors who exposed themselves to reminders of trauma with the intention of influencing their emotions, experienced more severe PTSD symptoms. Additionally, in a longitudinal study, depressed college students who were less motivated to feel happy experienced more severe clinical symptoms months later during a stressful period (i.e., final exams), even after accounting for their initial level of symptoms (Millgram, Joormann, et al., 2019). Although more research is needed to systematically assess the implications of emotion goals in psychopathology, current findings suggest that they might carry negative downstream implications.

What Underlies Different Emotion Goals in Clinical Populations?

A key observation is that in most studied disorders, people are relatively more motivated to experience emotions that characterize their disorder. For instance, depression was associated with stronger motivation for sadness and weaker motivation for happiness,

whereas anxiety symptoms were associated with stronger motivation for anxiety. In most studies, current emotions were controlled for, suggesting that people are not merely preferring emotions that are congruent with their current emotional states. One of the most pressing questions, therefore, is What could explain what seems like a self-defeating tendency to be less averse to the very emotions characterizing one's pathology? This question is the least investigated so far, but there is evidence pointing to potential answers.

One possibility is that people are motivated to experience familiar emotions. People generally favor familiar experiences (Zizak & Reber, 2004), possibly because familiarity itself is rewarding (Reggev et al., 2021). Ironically, when unpleasant emotions become familiar, such tendency could lead people to favor these emotions (Ford & Tamir, 2014). Relatedly, people might seek emotions that are consistent with their sense of self. According to self-verification theory (Swann, 1987), people seek to maintain a consistent self-image, even at the price of maintaining negative self-views. Similarly, people with certain psychopathologies might be motivated to experience self-consistent emotions even at the price of maintaining unhealthy emotional patterns. Indeed, using self-reports, Arens and Stangier (2020) found that depressed individuals were more likely to endorse a self-verifying motive ("It made me feel like myself") over a hedonic motive ("It made me feel good") for choosing sad music to listen to. Providing preliminary evidence for the causal role of self-verification in shaping emotion goals, healthy participants who were led to perceive themselves as sadder individuals were less likely than controls to select happy images to watch and reported greater motivation for sadness (Millgram et al., 2023).

Other explanations are also possible. For example, according to the contrast-avoidance model, people strive to avoid sharp emotional transitions from pleasant to unpleasant emotions (Newman & Llera, 2011). People might therefore seek to maintain unpleasant emotions to avoid such contrast. Additionally, people with certain disorders might feel hopeless about changing their emotions and therefore pursue emotion goals that they perceive to be within their reach. Testing these and other accounts (e.g., self-punishment) is an important task for future research.

Future Directions

Findings suggest that clinical populations differ from nonclinical populations in their emotion goals. There is also initial evidence that these differences carry negative implications—still, many open questions remain. First, more research is needed to identify disorder-specific versus transdiagnostic patterns of emotion goals. Stronger motivation for negative valence, for instance, might characterize a range of psychiatric disorders. It is also important to determine the degree of awareness and control people have over their emotion goals. For instance, are people aware that they sometimes pursue emotions characteristic of their disorder? And how difficult it is to change these emotion goals?

Second, research is needed to test the potential role of emotion goals in the maintenance versus onset of psychiatric disorders. For instance, could pursuing familiar emotions contribute to the persistence of some disorders, or alternatively, predict their development? Longitudinal studies are required to answer these critical questions.

Finally, future research could unravel the motives underlying emotion goals in psychopathology. Current research mainly touched on epistemic motives (i.e., self-verification), but emotion goals can be shaped by hedonic, behavioral, social, and eudemonic motives as well (Tamir, 2016). Future research should test the contribution of these motives, separately and in parallel. Ultimately, collecting and combining knowledge about the nature,

consequences, and antecedents of emotion goals in psychopathology could uncover new paths for improving mental health.

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CHAPTER 37

Amp It Up or Tamp It Down

EXAMINING STRATEGIES AND OUTCOMES OF POSITIVE EMOTION REGULATION

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It is possible to have too much of a good thing.
—AESOP

Many people aspire to simply be happy—in fact, the frenetic pursuit of happiness has led to a booming industry, with many self-help books and life coaches to help people reach their happiest self. Happiness, along with other positive emotions, does have scientifically supported benefits. But is there such a thing as too many positive emotions? And how might context and intensity change the effects of positive emotions? There is much less societal emphasis on effectively regulating positive emotions, such as knowing when to savor versus when to dampen positive feelings.

Positive emotions, such as gratitude, joy, and pride, may be more or less useful in specific contexts, and require different strategies to appropriately regulate them. Positive emotions have been theorized to have specific functions, providing actors with particular signals encouraging approach behaviors or to continue with specific thoughts and actions (Tugade & Fredrickson, 2004). The broaden-and-build theory, in particular, suggests that discrete positive emotions all have a general ability to *broaden* one's thought-action repertoires and *build* one's stock of social and psychological resources (Fredrickson, 2001). Distinct positive emotions can broaden and build in unique ways. For instance, a child feeling joy when playing with friends may be encouraged to continue in their fun; the exploration and social interaction that arises as a result thus adds to the child's personal resources (e.g., relationships with peers, creativity). Another individual may feel gratitude

for a gift received and feel valued in a social relationship; the expression of appreciation can enhance future interactions with a relationship partner and thereby strengthen the social connection (Algoe & Zhaoyang, 2016).

Emotion regulation (ER) is understood as an individual influencing *which* emotions they have, *when* they experience this emotion; and finally, *how* the emotion is experienced and expressed (Gross, 1998). While we most often think of ER with respect to negative emotions (e.g., down-regulating anger), positive ER is also of importance. ER can happen both consciously and nonconsciously, and may help individuals express an appropriate response to a situation or allow them to increase or decrease their positive and negative feelings. Importantly, which emotions should be expressed or suppressed, or to which degree, may differ across cultures—however, across all cultures, ER has great implications for mental and physical health (DeSteno et al., 2013), relationships (Gross & John, 2003), and professional outcomes (Newman et al., 2010).

There are a variety of ways to appropriately regulate positive emotions and there are even differences in positive ER across the lifespan. Research shows that positive ER has important consequences on physical health, mental health, and well-being. This chapter seeks to provide an overview of the current understandings and implications of positive emotion on well-being, as well as provide suggestions for future research and interventions.

Up- and Down-Regulation of Positive Emotions

An essential part of human life involves frequent experiences of positive emotions, like joy, pride, amusement, awe, and serenity, in order to have a high quality of life, well-being, and resilience (Fredrickson & Kurtz, 2011). Dual-process theories indicate that strategies to elicit positive emotions can be deliberately enacted (conscious or deliberate cultivation of positive emotions) or automatically activated (unintentional or effortless activation of positive emotions outside of one's conscious awareness; Tugade, 2011).

The “up-regulation” of positive emotions involves strategies aimed to create, maintain, or increase positive emotional experiences (Livingstone & Srivastava, 2012). The strategies most consistently implicated in up-regulating positive emotions are *engagement* ER strategies. In line with the process model of ER (Gross, 1998), these strategies involve situation selection (seeking out loved ones for comfort and support), attention deployment (directing attention to pleasant sights, sounds, sensory experiences), modification (shifting conversations to positive topics), and cognitive change (looking for the “silver lining” in an unpleasant experience). When using these engagement strategies, people can pursue different goals for their affect/emotion goals. For instance, people may seek *betterment*, which involves strategies aimed at eudaimonic experiences (planning and executing behavior toward accomplishment) and personal growth (meditating, practicing a new skill or sport). People may also seek *indulgence*, which involves strategies aimed at hedonic experiences, immediate reward, and gratification (going to a party, shopping, drinking alcohol, daydreaming, or playing video games; Livingstone & Srivastava, 2012).

In addition to increasing pleasant experiences, positive emotions are also up-regulated to minimize negative affective experiences (Tugade & Fredrickson, 2004). From this perspective, positive and negative emotions have complementary physiological functions that are adaptive for well-being. When negative emotions (e.g., anger, anxiety, sadness) are experienced, the body prepares itself for fight or flight. For example, when one experiences anger, the resulting physiological activation pattern may include

increases in heart rate, blood pressure, and skin conductance (Levenson, 1992). To cope with this anger, one could engage in a number of positive emotion-generating activities: use humor to cope by watching a comedy film, intensify joy by meeting with a good friend, increase serenity by meditating or taking a peaceful nature walk, elevate pride by enacting goal-oriented behaviors, or increase gratitude by savoring the good things in one's life. Cultivating positive emotions at the heels of a negative experience can "undo" the physiological activation pattern, thereby speeding physiological recovery from the negative emotional experience. In this way, up-regulating positive emotions can replenish and restore depleted resources, hence producing benefits to personal well-being and health (Tugade & Fredrickson, 2004). See a meta-analysis on the undoing effect of positive emotions for specific guidelines and recommendations regarding psychophysiological measurement (autonomic nervous system reactivity and recovery), moderators, and emotion-elicitation procedures (Behnke et al., 2023).

While most theories of ER focus on the desire for people to increase or prolong pleasurable experiences, less attention has been given to the down-regulation of positive emotions aimed to diminish pleasant states. Research shows that people with low self-esteem tend to dampen positive emotions to minimize personal anxiety (Wood et al., 2003). Social norms may also influence the extent to which people curtail positive emotional expressions (e.g., stop laughing at a funeral, remain humble about one's success). Finally, personal goals may also motivate the down-regulation of positive emotions. For example, one might minimize pleasant feelings when expecting a personal conflict or work-related confrontation (Tamir et al., 2008).

Positive ER and Mental Health

Disturbances in negative ER are most often focused on in clinical populations—that is, individuals with mood disorders may have difficulty regulating their negative emotions so that these emotions are not overwhelming or uncontrollable (Carl et al., 2013)—however, difficulties regulating positive emotions may play an important role as well, and positive ER may be an important target during treatment. In fact, improving positive emotionality and regulation may optimize long-term recovery, improve resilience, and promote symptom relief (Ehrenreich et al., 2007). Positive emotions, beyond feeling good, have been linked to enhanced emotional well-being. Fredrickson and Joiner (2002) posited an "upward-spiral" relationship where positive emotions lead to incremental changes in broad-minded coping, which can subsequently predict future increases in positive emotions. On the other hand, too many or too few positive emotions, and deficits in regulating the degree and amount of these emotions, may contribute to the onset or persistence of mood disorders (Carl et al., 2013).

Bipolar disorder is associated with elevated positive emotion responses—positive emotion persistence—that are activated, often inappropriately, across various emotional contexts (Gruber, 2011; see also Villanueva et al., this volume). Bipolar disorder is associated with self-focused, rather than other-focused positive emotions. Further, patients tend to amplify their positive emotions (i.e., positive rumination) and experience difficulties down-regulating; the feedback loop of positive emotions in response to short-term hedonic goals may come with long-term costs to well-being (Gruber, 2011). Alternatively, reduced positive emotion responses have been observed in individuals with depression. In fact, research shows that individuals with depression more habitually use strategies to down-regulate positive emotions (such as dampening or suppressing positive emotions),

and more frequently engage in strategies to up-regulate negative emotions (Vanderlind et al., 2020). For example, depressed individuals may engage in fewer self-reported positive activities and lack a positive attentional bias (i.e., they are less likely to choose positive over negative stimuli) as compared to their healthy peers, and may demonstrate bias in interpreting neutral events as negative versus positive (Vanderlind et al., 2020).

Positive ER Inspires Resilience

Resilience is the process and outcome of successfully adapting to challenging situations (Block & Kremen, 1996). Moreover, there are individual differences in trait resilience, which describes a personal orientation or quality that one has to cope effectively in the midst of adversity. Trait resilience has been shown to predict higher reports of subjective well-being (Satici, 2016), as well as life satisfaction and positive affect (Hu et al., 2015). Positive emotions and trait resilience have long been linked (Tugade & Fredrickson, 2004). Resilient individuals tend to engage in more appropriate positive ER and may be especially adept at using specific positive emotions to cope with stressful events. Indeed, they appear to have greater specificity in their verbal and conceptual representations of positive affective experiences, known as “positive emotional granularity” (Tan et al., 2022; Tugade et al., 2004). Resilient individuals may be adept at automatically activating regulation goals aimed at maintaining positive emotions (Tugade, 2011). As stressful situations already draw on one’s limited cognitive resources, the automatic activation of such goals is especially important. The cultivation of this ability requires practice; individuals who at first actively use positive emotions to cope with distress may, with time, turn this into an automatized strategy (Tugade, 2011).

Developmental Differences in Positive ER

Experiences of emotion differ across the lifespan—for instance, adolescents tend to experience more intensely valenced emotions compared to children and adults (McLaughlin et al., 2015). Further, studies document a reduction in daily positive affect from early to middle adolescence, as well as relative emotional instability that gradually improves in late adolescence to adulthood (McLaughlin et al., 2015).

Given the differences in affective experiences over the lifespan, it follows that regulation of these emotions changes over time as well. For instance, Zimmermann and Iwanski’s (2014) study demonstrated developmental differences in negative ER, specifically that midadolescence participants showed the least amount of appropriate ER and the smallest amount of regulation strategies, with a general increase in strategies and adaptive regulation with older participants. In terms of positive emotions, adolescents show a heightened sensitivity to reward, as well as a heightened desire for short-term rewards, and potentially a bias toward high-approach positive emotions versus low-approach emotions, such as gratitude (Gilbert, 2012). Therefore, adolescents may veer toward specific positive emotion strategies focused on short-term reward and high-approach positive emotions, while neglecting other strategies. This could be to their detriment, if adolescents consistently seek hedonic experiences at the expense of eudemonic ones. As Quoidbach and colleagues (2014) found, a diversity of emotional experiences (“emodiversity”) has been linked to indicators of well-being. Therefore, one should seek to develop a “balanced diet” of emotions and an extensive repertoire of ER strategies.

Children may have an even more difficult time appropriately regulating their emotions. As a rule, children generally have less cognitive control and therefore may have inherently less ability to regulate their emotions (Zeman et al., 2006). Children must continue to develop and differentiate their emotions and learn cultural rules surrounding emotion expression, as well as develop strategies for ER (Zeman et al., 2006; see also Spinrad & Eisenberg, this volume). Biological and environmental factors (e.g., parental socialization; Zeman et al., 2006) can affect a child's ability to effectively regulate their emotions. Meanwhile, older adults have a propensity to recall positive over negative information—the positivity effect—equipping them to more positively appraise negative effects than younger individuals (Urry & Gross, 2010). Adults also have years of experience developing their ER abilities and handling a variety of emotional situations, as well as other resources and skills built over the years (e.g., increased world knowledge; Park et al., 2002).

There are also age-related differences in goals for regulating positive emotional states, including low-arousal states (e.g., calm, peacefulness, relaxation) and high-arousal states (e.g., excitement, pride). When tracking the emotional life of individuals multiple times per day over several days, research shows that older adults show a greater preference to regulate emotions to achieve low-arousal positive states, compared to younger adults. Older adults may favor low-arousal positive emotions that are present oriented, whereas younger adults may be more inclined to experience high-arousal positive states that arise when they think of the future (Mogilner et al., 2011).

Examining these affective changes across the lifespan, therefore, highlight how positive ER and dysregulation can change over time. As individuals develop both physiologically and cognitively, their ER strategies increase and differentiate, and their competencies in various strategies may wax or wane as a result of developmental changes and individual differences.

Future Directions

Future research into positive ER will benefit from the use of more diverse research paradigms and measurements (e.g., ecological momentary assessment) to capture the wide range of regulation strategies, and the variety of contexts in which regulation occurs. Similarly, more objective measures of well-being (e.g., physiological markers) can help reduce the risk of participant bias and other limitations that come with global, retrospective self-reports. Attention to the regulation of positive emotions may supplement existing clinical treatments. Vanderlind and colleagues' (2020) findings on the nature of positive emotion preferences in individuals diagnosed with major depressive disorder highlights a potential target for psychological intervention—that is, targeting one's emotion preferences. Further knowledge and research in this area may also benefit nonclinical populations, by facilitating individuals to make the most of their positive emotions.

The use of newer technologies, such as virtual reality, may be useful in improving ER. Virtual reality can immerse individuals in real-life environments that can allow individuals to practice changing their habitual positive emotional responses in different environments (Montana et al., 2020). These technologies can be useful but are still relatively new and require more robust research to develop tested and evidence-based programs and interventions.

Positive emotions are, counterintuitively, not always positive. Literature in the field suggests that there are situations where it is beneficial to down-regulate positive emotions,

just as it may sometimes be beneficial to up-regulate negative emotions. Knowing when and how to appropriately regulate positive emotions can lead to higher well-being and disturbances to positive ER can be unproductive and may be actively harmful. For example, in individuals with bipolar disorder, an overabundance of positive emotions may encourage one to seek out short-term hedonic pursuits that prove costly to one's long-term well-being (Gruber, 2011). The recent increased interest in positive ER signals an encouraging shift in the field—only by considering both positive and negative emotions can individuals realize the full benefits of regulating their emotions.

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CHAPTER 38

Well-Being after Psychopathology

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Mental disorders afflict humanity on a vast scale. For example, the World Health Organization (2004) estimates that half a billion people struggle with depression and anxiety. Those who struggle often experience great distress, whether crippling fear of a panic attack, angst of remembered trauma, or paralysis from compulsive rituals. Impairment in major life roles—as worker, caregiver, or partner—is another common consequence of psychopathology (Becker et al., 2011). Collectively, mental health problems account for more than a fifth of all years lived with disability (Vigo et al., 2016).

Psychopathology is so strongly associated with negative consequences that positive outcomes are rarely considered. Take, for example, high levels of psychological well-being (HWB), a crucial element of human flourishing or thriving. One might reasonably expect the prevalence of HWB to be vanishingly low among people who currently experience mental health diagnoses, such as depression or anxiety. But what about the large group of people who have subclinical symptoms? Or what about people who were previously diagnosed but no longer experience mental health symptoms? Are mental health disorders so destructive of well-being that they preclude the experience of HWB? Virtually no one in these latter groups experiences HWB? We lament the historic absence of systematic data collection on HWB across mental health fields, such as psychiatry, psychology, and public health (see Rottenberg & Kashdan, 2022). In this chapter, we focus on our efforts to provide the first credible estimates of HWB among those previously diagnosed with psychopathology.

Rather than focusing on positive outcomes, such as HWB, mental health fields have predominantly tracked symptoms or disorders. For instance, those who formally evaluate treatment consider the extent that treatments reduce the symptoms of mental illness rather than improving other aspects of well-being. Similarly, studies of the long-term course of mental health problems focus on whether these problems recur or persist rather than on whether patients become well (McKnight & Kashdan, 2009). It should be underscored that these outcomes are distinct. For instance, empirical studies demonstrate that

eliminating symptoms of depression is insufficient to create joy, meaning, or satisfaction with life (Duckworth et al., 2005; Trompetter et al., 2017).

The neglect of well-being in psychopathology research is perplexing for additional reasons. Survey data indicate that patients value attaining well-being as much (or more) than relief from symptoms (e.g., Chevance et al., 2020). Anecdotal evidence abounds that psychopathology is sometimes followed by periods of HWB. Most practicing therapists can readily identify clients who have done extraordinarily well. And the public is widely aware of celebrities, such as Dwayne “the Rock” Johnson and Ariana Grande, who report overcoming mental health adversity and developing a life full of purpose and happiness. In sum, with multiple indications that some individuals attain HWB after psychopathology, it is baffling that the fields charged with improving mental health outcomes have not collected systematic data on HWB (see Rottenberg et al., 2018; Wood & Tarrier, 2010).

Early Data on the Prevalence of Well-Being after Psychopathology

To facilitate these initial estimates of HWB after psychopathology, our research group made several practical decisions. First, we focused on HWB as an outcome because psychological well-being is valued and can be readily and validly measured (e.g., Diener, 2009). Amid multiple conceptions of psychological well-being and long-standing debate about measurement, most contemporary views encompass both hedonic aspects (such as the experience of happiness and life satisfaction) and eudemonic aspects (such as possessing self-acceptance or purpose in life; e.g., Kashdan et al., 2008; Ryan & Deci, 2001).

Second, to identify *who* is experiencing HWB, we employed a population-based norms approach (Rottenberg et al., 2018). Specifically, we took advantage of the size and representativeness of national datasets to benchmark well-being norms for people who did not report psychopathology and then assess whether people with a reported history of psychopathology met those norms. Our full definition of HWB after psychopathology includes three parts: (1) documented history of a mental disorder; (2) full recovery from the disorder (defined as zero or minimal symptoms for 6 or more months); and (3) whenever possible, norms-based evidence of psychological well-being using available data from peers without a history of mental disorder. Our standards for HWB after psychopathology required a person with psychopathology to both no longer have symptoms and meet or exceed standards met by the top 25% of the normative sample across multiple facets of well-being representing both hedonic and eudemonic well-being. Specifically, we required the person to report a profile of well-being across facets that was both broad (consistently above the mean) and strong (e.g., a standard deviation above the mean).¹

Our first analysis used the MIDUS dataset, a longitudinal study of nearly 3,500 American adults that had 10-year follow-up data. Returning to the key question, we asked, What is the chance that people with a history of depression would achieve the HWB standard met by the top quarter of nondepressed persons? Contrary to the idea that HWB after psychopathology is rare, it occurred in 10% of adults with a history of depression, compared to 21% of those without a depression history (Rottenberg et al., 2019). Rather than eliminating the chance of experiencing HWB, depression only halved it.

We observed a similar pattern of findings in a second U.S. national sample of adolescents where we focused on nonfatal suicide attempts. Specifically, we examined 15,700

¹By no means does this standard dictate that only 25% of a given population can achieve HWB. Rather, these norms are based on recent data on the mental health status of Americans, where numerous factors presently inhibit population well-being.

youth in the United States who were followed for 7 years in the Add Health dataset. Of these youth, 574 reported a nonfatal suicide attempt at baseline. Seven years after their suicide attempt, nearly one in seven reported HWB compared to about one in four who had no history of attempt or suicidal ideation. In other words, a suicide attempt, despite signaling distress and a decision to end one's life, did not preclude the possibility of achieving high levels of future well-being (Tong et al., 2022). Similar to what was observed with depression, surviving a suicide attempt reduced a person's probability of future well-being by about half relative to nonsuicidal peers.

We next analyzed data from a national Canadian sample, specifically the 2012 Canadian Community Health Survey (a national sample of 25,000 Canadian adults; Statistics Canada, 2013). Some of the same patterns emerged among Canadian adults. In Canada, about 10% of people with a history of psychopathology met our HWB criteria, compared to 24% without a history of psychopathology. One advantage of the Canadian Community Health Survey was that many forms of psychopathology were assessed. Comparing across disorders, rates of HWB varied by the type and presentation of psychopathology. For example, HWB rates were two to three times lower in people with a history of bipolar disorder than in people with a history of depression and substance use disorders (Devendorf et al., 2022). These findings echoed an earlier result in which we found the prevalence of HWB was considerably lower among people with a history of generalized disorder than people with a history of depression (Disabato et al., 2021).

Together, these findings document that it is not uncommon for people to experience HWB after episodes of psychopathology. At the same time, early indications are that this prevalence varies—for example, as a function of clinical condition. This variation suggests that there are likely underlying factors (both measured and unmeasured) that account for why some people attain well-being after psychopathology and others do not. To consolidate our knowledge, we see the most pressing next steps for the field as (1) explaining pathways that account for these transitions to wellness, and (2) considering what can be done to increase the number of people who undergo these transitions. For the balance of this chapter, we argue why emotion regulation (ER) occupies a central position in both of these steps.

Identifying ER Factors That Explain Transitions to HWB

In explaining pathways to HWB, our default assumption is that this outcome is almost certainly multiply determined. Some key pathways may overlap with those already known to constitute and/or predict general well-being, such as having healthy social relationships, good physical health, an optimistic outlook, or self-efficacy. Other key pathways may overlap with resilience factors repeatedly identified by clinical, social, developmental, educational, and organizational researchers, such as openness to a wide range of emotions, developing willpower, feeling a sense of autonomy, and pursuing behaviors aligned with one's purpose in life (Hayes et al., 2019; Ryan & Deci, 2000). There is also likely to be a role for the clinical factors historically important in psychopathology research, such as specific diagnosis, comorbidities, symptom severity, and types of treatments received. While some pathways to HWB are likely to be relatively fixed (i.e., genetic composition), others will fall more readily within human control—such as routines, habits, or coping styles—bringing us to the domain of ER.

The domain of ER is rich for several reasons. First, ER already has a strongly established role in well-being (Bonanno & Burton, 2013; Tamir, 2021). Second, while many aspects of ER are automatic in nature, others are controllable (Pruessner et al., 2020).

Third, ER is already packaged in psychologically based interventions to reduce symptoms of psychopathology and augment human well-being (van Agteren et al., 2021; Walton & Wilson, 2018; Mennin & Fresco, this volume). Therefore, by identifying the ER pathways that predict good outcomes and intervening to teach healthy ER patterns, it should be possible to increase the number of people who experience HWB after psychopathology.

Numerous reasonable ER mechanisms may explain HWB after mental illness. Indeed, a challenge of unpacking ER pathways is that there are so many ways to operationalize and measure ER. Traditionally, work on emotion and well-being has focused on the size of the person's repository of ER strategies and how frequently they use specific strategies. Immediate empirical questions concern whether a larger repository of ER strategies, lower use of maladaptive strategies (e.g., rumination; see Watkins, this volume), or greater use of adaptive ER strategies (e.g., reappraisal; see Uusberg & Uusberg, this volume) explains meaningful variance in who achieves HWB after psychopathology.

Given the large array of potential ER targets, where do we put our money? Three places: First, we see psychological flexibility as the highest potential explanatory and intervention pathway. The construct of flexibility includes having awareness of what demands are required and what resources are available in a given situation, being able to correctly match an ER strategy to a specific context, and monitoring feedback to determine whether and how to adjust ER accordingly. Flexibility has strong theoretical support as a fundamental aspect of psychological well-being (Doorley et al., 2020; Kashdan & Rottenberg, 2010).

Inflexibility may explain why many people with psychopathology exhibit compromised well-being. People suffering from depression and social anxiety elicit fewer positive events from the environment and have difficulty feeling positive emotions when such events occur (see Kashdan & Rottenberg, 2010, for a review). Other work finds that psychopathology can obscure a person's ability to derive meaning from events and pursue a purpose in life (e.g., Goodman et al., 2018). Flexibility itself may be malleable. With intentional training, people with and without psychopathology show gains in down-regulating negative emotions and up-regulating positive emotions (Dahl et al., 2020; von Agteren et al., 2021), as well as harnessing negative emotions as motivational fuel (Kashdan et al., 2020; Tamir, 2009).

To capitalize on the promise of psychological flexibility, more fine-grained analyses are needed. For example, is more flexibility always better, or can it be problematic to have too much flexibility or too broad an ER repertory? What is the ideal speed for adjusting ER strategies in real time? In which types of situations is persisting with one strategy better than switching strategies? Such questions move us away from one-size-fits-all solutions toward the more nuanced contingencies of people coping with unique histories of psychopathology in varied situations. This highlights the benefit of idiographic approaches that collect intensive individual-level data to identify the optimal well-being tools for particular historical backgrounds and individual characteristics (as opposed to relying on group means).

Second, social relationships—namely, social support utilization—are another obvious candidate area to explain pathways to well-being after psychopathology. Much of our most painful and pleasurable activity involves thinking about or spending time with other people. Strangely, humans are biased to view their own social network and activity as inferior to the lives of others (Deri et al., 2017). The more someone underestimates their access to high-quality, satisfying social interactions, the worse off their well-being. Thus, well-being in the aftermath of psychopathology may track evaluations of resource capacity with respect to the proximity of close, trusted allies (Beckes & Coan, 2011), especially those who complement our knowledge and skills (Aron & Aron, 1997). Effective ER operates through the intentional pursuit of interpersonal proximity: Talking to others and gaining novel perspectives provide opportunities to improve coping with stress

and savoring positive experiences and accomplishments. Thus, how people attend to what others offer, select others for interactions and relationships, and leverage others to advance goals, represent important ways people may foster HWB after mental disorders (see Niven, this volume, for more on interpersonal ER).

Finally, and also complementing traditional work on ER strategies, we see value in examining several habits around physical health, including nutrition, exercise, and meditative practices. In traditional psychological care, physical health habits are sometimes overlooked or disregarded as components of distress management, but they likely have utility for rebuilding well-being after episodes of psychopathology. People with better physical health, for example, may have more energy to try out different ER strategies, persist longer through distress, and respond to distressing situations with less emotional reactivity.

Can Knowledge about ER Be Used to Increase the Number of People Who Experience HWB after Psychopathology?

The study of ER processes historically exemplify the interplay between basic research and clinical research, with knowledge about ER and well-being in normative populations then applied to help persons with mental health problems. This history makes us optimistic that knowledge about ER and ER deficits in psychopathology can be leveraged to inform targeted clinical research designs, which examine the ultimate downstream effects on the well-being of cultivating ER characteristics across clinical populations. Ultimately, work on well-being after psychopathology has high potential to improve population mental health by (1) augmenting existing treatments, (2) developing new treatments, and (3) fashioning novel self-help procedures.

Promising ER interventions to augment well-being after psychopathology include promotion-focused practices, such as practicing gratitude, forgiveness, savoring, humor, and humility (Carr et al., 2020). Observing that well-being becomes commonplace after awareness training, there is promise in procedures that create greater awareness of self and response across situations (Dahl et al., 2020). Awareness training can be paired with increased insight, where people are made cognizant of their jagged profile of psychological needs, emotion goals, and default preferences across situations. Self-insight allows for an individual to calibrate what works best to optimize their outcome in the short and long term and what steps are most connected to ultimate life goals (Damon, 2008; McKnight & Kashdan, 2009). In this framework, persons with psychopathology would be encouraged to engage in ER strategies that facilitate happiness, meaning, and purpose in life, and/or psychologically rich experiences (Oishi et al., 2020)—ER practices that should become easier to enact as symptoms and impairments abate.

Concluding Remarks

Refocusing on positive mental health outcomes is timely. At this moment, mental health care is being reimagined. The COVID-19 pandemic has called attention to urgent unmet mental health needs, the inadequacy of traditional mental health service delivery, and new models for delivering mental health care (such as telehealth, peer models, or text-based therapy; Gruber et al., 2021). A mental health care system that aspires to increase well-being—using ER and other strategies—is better positioned than the status quo system to treat patients to full recovery with sustained periods of psychological well-being. Ultimately, increasing the proportion of people who achieve good outcomes after mental illness not only promises

better lives for those directly affected and their loved ones, it also offers profound social impacts: fewer people dropping out of high school and college; more engaged, productive, and creative workers; and lower burden on the health care system.

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CHAPTER 39

The Costs of Striving to Feel Good

BRETT Q. FORD

It is natural to want to feel good. Indeed, the vast majority of emotion regulation episodes are motivated by the goal to feel good: Experience sampling studies suggest that people strive to maintain or increase pleasant feelings and/or to stop or decrease unpleasant feelings during 70–92% of emotion regulation episodes (Tamir, 2016). This should be no surprise—feeling good not only feels good (a reward in itself) but it also helps people live healthier and more productive lives (Lyubomirsky et al., 2005; Pressman et al., 2013).

So what's the problem? Well, wanting to feel a particular way does not guarantee we'll feel that way and the process of striving can itself have paradoxical outcomes. For example, striving to feel pleasant emotions can promote *worse* well-being (Zerwas & Ford, 2021). Furthermore, emotions (both pleasant and unpleasant) help us achieve other valued life goals and we can hinder those goals by prioritizing (and/or avoiding) particular emotions. For example, reducing unpleasant emotions can backfire by jeopardizing action at times when action is needed most (e.g., to address threats to one's community; Ford & Troy, 2019). Although it is perfectly reasonable to strive to feel good—that is, toward pleasant emotions and/or away from unpleasant emotions—mounting evidence suggests there can also be important costs.

I begin by reviewing recent research on the costs of merely *wanting to feel* good, beginning with research on wanting to feel pleasant emotions, and then discussing research on wanting to avoid unpleasant emotions. Then I review recent research on the costs of actually *feeling good*, including costs associated with feeling pleasant emotions, as well as costs associated with avoiding unpleasant emotions. I end with a discussion of future directions centered on promising avenues that may help mitigate the costs of striving to feel good and avenues for extending this research to address pressing societal needs.

What We Want to Feel

Wanting to Feel Pleasant Emotions

Many people want to feel pleasant emotions (Diener et al., 1998) and typically, the more someone strives for any goal, the more likely they are to reach it (Tamir & Hu, this volume). However, this logic may not always apply to the goal of feeling pleasant emotions. For example, a growing body of work suggests that wanting to feel happiness can actually predict worse outcomes in the short run (e.g., less positive emotion) and in the long run (e.g., worse psychological health), even when happiness is most within reach (Zerwas & Ford, 2021). For example, individuals experimentally induced to value happiness more intensely experienced *lower* levels of positive emotion after watching a positive film clip compared to those in a control condition (Mauss et al., 2011). In addition, habitually valuing happiness to an extreme degree predicted lower life satisfaction (Luhmann et al., 2016) and greater risk for depression and bipolar disorder (Ford et al., 2014; Ford, Mauss, et al., 2015). Interestingly, these patterns appear to be specific to relatively individualistic cultural contexts (e.g., North America) and may not extend to more collectivistic cultural contexts that support more effective, socially oriented pursuits of happiness (e.g., Russia, Japan, Taiwan; Ford, Dmitrieva, et al., 2015).

Recently, we published a conceptual framework to identify plausible mechanisms that underlie *why* striving for happiness can backfire in individualistic cultural contexts (Zerwas & Ford, 2021). We proposed that one key problem posed by striving for happiness rests in the *judgments* that people make about emotions. When someone strives for happiness and is concerned about the happiness they may (or may not) feel, they are more likely to monitor and judge their moment-to-moment happiness. When such judgments fall short, unpleasant *meta-emotions* can follow, whereby people feel disappointed in their own happiness (Mitmansgruber et al., 2009). As these unpleasant meta-emotions accumulate across daily life, people experience worse mental health. We found preliminary evidence for this model in a longitudinal daily diary study measuring how disappointed people felt in their happiness even when happiness is most within reach; during positive events (Zerwas et al., 2023). Such findings point to the important role of meta-emotional judgments in interfering with the ability to achieve happiness even—and perhaps especially—for those who are most concerned about their happiness.

Wanting to Avoid Unpleasant Emotions

While striving to feel good can involve wanting to feel pleasant emotions, it also commonly involves wanting to avoid unpleasant emotions (see Millgram, this volume, for important counterexamples). Consistent with evidence suggesting that seeking pleasant emotions can backfire, research also indicates that people who strongly want to avoid unpleasant emotions often end up experiencing *more* unpleasant emotions and worse psychological health. Interestingly, theory also suggests that meta-emotional judgments play a crucial role here as well. Specifically, when someone wants to avoid unpleasant emotions but these emotions arise anyway (as they naturally do), people are more likely to experience unpleasant meta-emotions in response to that initial emotional response (e.g., a parent feeling guilty because they were angry at their child), which compounds the negative emotional experience, heightening its intensity and/or duration (Campbell-Sills et al., 2006). Such exacerbated unpleasant emotional experiences can then accumulate over time and shape longer-term health outcomes. Several related lines of work converge

on these patterns, including work on mindfulness (including emotion [non]judgment; Baer et al., 2008), distress intolerance (Macatee et al., 2015), and experiential avoidance (Chawla & Ostafin, 2007).

One recent multimethod examination provided evidence for the costs incurred by people who habitually judge and want to avoid their emotions (e.g., endorsing items like “I think some of my emotions are bad or inappropriate and I shouldn’t feel them”). First, in a laboratory study, we found that such individuals experienced stronger unpleasant emotional responses to a standardized laboratory stressor. Then, in several large samples of undergraduate and community participants, we confirmed that such individuals also experienced worse psychological health across a variety of metrics. Bringing these patterns together in a longitudinal daily diary study, we found that such individuals experienced stronger unpleasant emotion during their most stressful daily events across 2 weeks of life, which, in turn, accounted for worse psychological health 6 months later. It is also worth noting that the costs of emotion judgment appeared to generalize broadly, as they were not moderated by sociodemographic features (gender, ethnicity, socioeconomic status) or by life stress severity across multiple diverse community samples (Ford et al., 2018).

Overall, multiple lines of work suggest that excessive seeking out (or avoiding) particular emotions integrally involves judging and evaluating one’s emotions, which in turn, often leads to paradoxical outcomes that can further jeopardize longer-term mental health.

What We Feel

Feeling Pleasant Emotions

If individuals can successfully cultivate pleasant emotions, research indicates that benefits often follow (Lyubomirsky et al., 2005)—however, we can also expect that no phenomenon will *always* be adaptive and there are at least two ways in which experiencing pleasant emotions can predict worse outcomes: when those emotions are felt to an extreme degree and when they are felt in contexts that do not benefit from—and may even be harmed by—pleasant emotions.

Prior research and theory indicate that greater levels of pleasant emotion do not necessarily translate into better outcomes and may even predict maladaptive outcomes (Gruber et al., 2011). For example, feeling intense pleasant emotions can push individuals to engage in risky behaviors (e.g., substance use; Cyders & Smith, 2008). As an additional example, the experience of mania—which is defined as persistently elevated mood—is associated with numerous functional deficits and even within individuals with mania, experiencing more intensely elevated mood predicts worse illness course (Gruber et al., 2011).

Aside from the costs associated with extreme levels of pleasant emotion, additional costs may arise from experiencing even moderate levels of pleasant emotions in contexts where those emotions are not functional. For example, while pleasant emotions may help individuals collaborate successfully with others, they may be less useful in other contexts that benefit from being assertive and/or vigilant. Indeed, experimental evidence suggests that individuals induced to feel excited (vs. other emotions) performed *better* within collaborative scenarios but performed *worse* within confrontational scenarios, which benefited more from feeling anger (Tamir et al., 2008). Similarly, individuals induced to feel

excited were less likely to pay attention to possible threats in their environment compared to those induced to feel fear, which can usefully attune individuals to possible threats (Ford et al., 2010). Such findings underscore the importance of considering the context in which emotions are experienced to understand their downstream outcomes.

Avoiding Unpleasant Emotions

Just as people commonly seek pleasant emotions, they also avoid unpleasant emotions. However, unpleasant emotions are also *functional* experiences that can help people achieve important goals in their lives (Frijda, 1986). As such, feeling unpleasant emotions too little, particularly in contexts where those emotions could serve valuable functions, can jeopardize other important life goals (Tamir, 2016). Such contexts are often fraught, however, given that unpleasant emotions often—and understandably—evoke attempts to protect one's well-being by using emotion regulation to reduce these emotions. As such, using effective forms of emotion regulation to minimize unpleasant emotions can help people feel better but reducing these emotions can also result in downstream personal, social, and collective costs (Ford & Troy, 2019).

Several lines of work exploring the costs of avoiding unpleasant emotions have focused on the role of cognitive reappraisal, given that it can effectively reduce unpleasant emotions (Webb et al., 2012) and is commonly used to manage daily stressful experiences (Ford et al., 2017, 2023). Reappraisal involves reevaluating a situation to change its meaning (e.g., reconsidering whether a situation is as severe as it seems; Uusberg & Uusberg, this volume). By targeting emotion at its source, reappraisal can effectively improve day-to-day emotions and translate to greater longer-term mental health—however, several lines of research also suggest that individuals can experience *worse* personal outcomes when they successfully reduce negative emotions (using effective strategies like reappraisal) that could otherwise be useful for solving a given problem. For example, those who reduced unpleasant emotions like moral outrage using reappraisal during a partnered economic game accepted more unfair offers from other participants (van't Wout et al., 2010). If people habitually use reappraisal to reduce negative emotion in contexts that could benefit from taking action, people may regularly miss out on opportunities to improve their own situation, which may carry longer-term personal costs as well (see Mauss & Troy, this volume, for more detailed discussion).

The social costs of minimizing unpleasant emotions have also begun to be explored. For example, in an examination of emotion in the workplace (Feinberg et al., 2020), using reappraisal to reduce unpleasant self-conscious emotions like guilt and shame predicted greater life satisfaction and less job burnout but also predicted more unethical workplace behaviors (e.g., saying something hurtful to coworkers, falsifying reimbursement receipts). Experimental studies also found that people instructed to use reappraisal to reduce guilt and shame were more likely to withhold valuable resources from task partners and cheat on a work task, providing causal evidence for the social costs of using reappraisal to reduce self-conscious emotions like guilt and shame.

Further research has demonstrated collective costs. As one key example, reducing unpleasant emotions, like moral outrage, can jeopardize people's motivation to engage in democracy-shaping collective action aimed at changing the political system that evoked such emotions in the first place (e.g., donating, volunteering, demonstrating). In an initial empirical demonstration of this idea, we found that Democrats who used reappraisal to manage their negative emotions about losing the 2016 U.S. presidential election were less likely to engage in political action (Ford et al., 2019). Then, in two daily diary studies

with nearly 13,000 observations, we found direct evidence for the unfortunate dilemma that politics poses: for individuals across the political spectrum, using reappraisal to manage unpleasant emotions about politics in daily life predicted greater daily well-being but also predicted less daily motivation to engage in political action (Ford et al., 2023). As another key example, we found that people who successfully used reappraisal to manage their emotions about the ongoing COVID-19 pandemic experienced lower fear, which in turn accounted for better mental health over time, but lowered fear also predicted *fewer* protective health behaviors that are known to slow the spread of the disease and save lives (e.g., social distancing, mask wearing; Smith et al., 2021).

Overall, although it is perfectly natural to want to increase pleasant and decrease unpleasant emotions, multiple lines of work suggest that attaining these goals can come with other important costs.

Future Directions

The research reviewed here paints a nuanced picture of which emotions are “best”—suggesting that what is “best” is not a feature of a particular type of emotion but rather, depends on the degree and context in which any emotion is experienced. But given that it is normal to want to feel good, where can we go from here?

First, one theme revealed in the work reviewed here is the insidious effects of judging one’s emotions, whether those emotions are pleasant or unpleasant. One pathway forward is to explore alternatives to emotional judgment, such as emotional acceptance, an active process whereby people turn toward their emotions and engage with them magnanimously (Hayes et al., 1999). Such an approach can help avoid negative meta-emotions and have fewer downstream costs as people stay connected to the motives that underlie their emotions. For example, initial findings suggest that using emotional acceptance in the face of politics-induced stress predicted greater well-being and did not interfere with individuals’ motivation to take political action (Ford et al., 2023).

Second, it is valuable to identify ways of leveraging effective strategies, like reappraisal, that can enhance individuals’ well-being without jeopardizing other valued goals. Reappraisal is a powerful tool that can be used in many ways (beyond minimizing unpleasant emotions), some of which may be particularly well suited to protect both individual and collective well-being. In support of this idea, we found that people who used reappraisal to feel more socially oriented positive emotions (like compassion and gratitude) in the context of the COVID-19 pandemic were *more* likely to engage in community-protecting health behaviors while also experiencing *better* mental health over time (Smith et al., 2021).

Third, the most pressing collective issues we face are also often the most emotionally distressing. People naturally strive to feel good when faced with distress, which research suggests may come with costs to the collective. As such, making progress on these issues using all available tools—including those from psychological science—requires a greater understanding of the emotion and emotion regulatory processes that are evoked within such issues. Unpacking these processes can provide a valuable avenue for progress across many important domains in addition to those reviewed above, such as racial justice (Ford et al., 2022), inequality (Kraus et al., 2019), climate change (van Zomeren et al., 2019), and others. By carefully considering the costs of striving to feel good, we can identify promising pathways to protect well-being not only for individuals but also for the collective.

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CHAPTER 40

Emotion Regulation and Psychopathology across Cultures

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EZGI TUNA
MAYA TAMIR

Maria, a Mexican immigrant to Texas, lost her husband in a car accident 7 months ago. The intensity of her grief has not abated since. Maria's family thinks of her distress as protracted but normal, given the circumstances. Her American coworkers encourage her to see a counselor to get screened for depression. Maria's case helps us think about emotion regulation within the context of potential mental illness and the importance of considering culture. There is a sizable literature on emotion regulation and psychopathology and a smaller literature on culture and emotion regulation. Few studies, however, combine these topics, perhaps due to unique methodological challenges and siloed training in clinical and cultural psychology. Rather than summarizing an established body of literature, this chapter highlights a budding research area and sets the stage for future developments.

The domain of grief is used in this chapter to generate examples. Responses to loss span the range from normal to dysfunctional and disabling. Although people across cultures recognize loss as painful, they diverge in focusing on emotions versus other aspects of loss, expectations for the course of distress, and strategies for adapting to it. These factors make grief a helpful domain for examining the ways in which culture informs the links between emotion regulation and psychopathology.

Definitions

Culture

We rely on a classic definition of culture by Kroeber and Kluckhohn (1952): “patterns of and for behavior acquired and transmitted by symbols” (p. 151). Culture and psychological functions are mutually constituted. Culture includes aspects that are “in the head”

(e.g., theories of reincarnation), and “in the world” (e.g., sitting shiva in Jewish tradition). In this chapter, we will use the terms *cultural models* and *scripts*. Cultural models refer to sets of beliefs, norms, values, and behavioral expectations that encompass culturally shared knowledge about a particular domain. Cultural scripts refer to those models that are sequential. Because emotions and psychological disorders are dynamic, cultural models of these phenomena are often script-like. Cultural contexts tend to foster sets of competing cultural models. For example, the Toraja people of South Sulawesi, Indonesia, describe multiple scripts of grief-triggered distress, with insanity scripts differing from those that involve possession trance (*ma'deata, diala bugi'*) or seeing the souls of people (*pakita bombo*; Wellenkamp, 1988). Cultural scripts of distress inform and shape detection and experience and expression of symptoms, including emotional ones.

Emotion Regulation

The extended process model of emotion regulation defines it as the dynamic ways in which people detect emotions, determine that they want/need to regulate them, and attempt to do so (Gross, 2015). Using this model as our framework, we describe implications of cultural-clinical psychology for identification and evaluation of the need to regulate and selection and implementation of regulatory strategies. Although emotion regulation research incorporates work on both explicit and implicit regulation, we know more about the former, particularly when it comes to the role of culture. Reflecting this state of knowledge, we focus on conscious and deliberate regulation.

Identification: Should an Emotion Be Regulated?

People experience continuous affective changes. In order for detection, identification, and evaluation of emotions to occur, they need to recognize and label a change as an emotion, differentiating it from other changes. This process is determined jointly by the characteristics of the state itself, such as its intensity or duration, and individual tendencies, such as the propensity to attend to emotions. Culture may affect identification of emotions and emotional syndromes. Attention to emotions is normalized in Western, educated, industrialized, rich, and democratic (WEIRD) cultural contexts, and the lack thereof is understood as pathological (e.g., as alexithymia; Honkalampi et al., 2018). This may be partly due to the fact that WEIRD cultural contexts foreground emotions as an important slice of subjective experience. This tendency is not universal, with cultures fostering different local theories of emotions (Luhrmann, 2020). Parents from WEIRD cultures attend to their children’s emotions more than parents from East and South Asia (e.g., Daga et al., 2015); adults from some non-Western cultural contexts also direct less attention to emotions (e.g., Aival-Naveh et al., 2019). For example, Levy (1973) proposed that in Tahitian culture, sadness in response to loss is “hypocognized,” with people speaking of and attending to this emotion less. Recent work on alexithymia suggests that although some aspects of this construct (e.g., difficulty identifying feelings) are associated with dysfunction across cultures, correlates of others (e.g., attention to concrete information) depend on culture (see Ryder et al., 2018). In sum, the extent to which emotions are emphasized and focused on is shaped by culture.

Parsing emotions into a domain to be regulated depends on understanding them as a salient slice of subjective reality and attending to this slice. For emotion regulation to unfold, people also need to differentiate emotional input from other dynamic flows

of interoceptive and exteroceptive information (e.g., somatic, cognitive)—that is, some changes may be identified as emotions (e.g., sadness), some as cognitions (e.g., confusion), physical changes (e.g., fatigue), or spiritual phenomena (e.g., possession). In one study of widows in Nepal, emotional challenges were reported alongside problems with sleep, fainting, or inability to think (J. Kim et al., 2017). Although the basic distinctions between the mind and the body may be universal (Bloom, 2007), the extent to which emotions are distinguished from other types of changes depends on culture. One study examined concepts of mental life in the United States, Ghana, Thailand, China, and Vanuatu (Weisman et al., 2021). Children and adults from these contexts were similar in their tendency to differentiate somatic sensations and cognition. Against this background, differences emerged in the conceptualization of emotions. In some contexts (e.g., China, United States), emotions were conceptualized as a domain that is separate from both the body and cognition. In others (e.g., Ghana, Vanuatu), at least some emotions were lumped with these domains. Children demonstrated incomplete mastery of the adult models of emotions, suggesting that understanding the relationships between emotions and other domains requires enculturation. Relationships between emotional, somatic, and cognitive symptoms of depression also show some cultural similarities, as well as differences (Goodmann et al., 2021).

These differences may have implications for regulation. When changes are interpreted as somatic or cognitive, they may be regulated differently from when they are interpreted as emotional. Consider Cambodian refugees. In this community, a salient script of distress is that of *khyâl* attacks, understood to be caused by disruptions in the flow of a wind-like substance through the body (Hinton et al., 2013). Bereaved Cambodians tend to interpret distress triggered by recalling their losses as these attacks. The script for *khyâl* attack promotes somatic regulation strategies, such as coining (rubbing the body with a coin). Thus, conceptual boundaries between different domains of subjective experience can drive regulation efforts.

Once identification occurs, people may consider whether an emotion matches a desired emotion (see Tamir & Hu, this volume) and evaluate the need to regulate toward this goal. For example, families of stampede victims in Cambodia are faced with a discrepancy between their acute sorrow and a Buddhist ideal of acceptance of life's impermanence (Eisenbruch, 2021). We know that desired emotional states differ across cultures and are associated with cultural values (Tamir et al., 2016). Target emotions can also differ for emotions linked to distress (e.g., grief; Koopmann-Holm & Tsai, 2014). Finally, emotional dysfunction can be valorized (e.g., burnout) or devalorized (e.g., schizophrenia), further shaping communication and regulation efforts (Chentsova-Dutton & Ryder, 2019).

Cultural-clinical psychology introduces another layer of valuation. Regardless of whether an emotion is considered desirable, it may or may not be considered an index of pathology. Some emotions may meet the threshold for “symptomatizable experience,” signaling a known malady (Chentsova-Dutton & Ryder, 2019). In the context of potential mental illness, emotional changes may be understood as potential symptoms of a known form(s) of distress. These changes cross the threshold from mere ebb and flow of subjective experiences and behavior, to not only being recognized as emotions discrepant with salient desired states but as signals of distress. When Maria felt surges of sadness, she considered whether these feelings are a normal part of grief versus some form of distress. Scripts of mental illness differ across cultures. Whereas Maria’s coworkers wonder about depression or anxiety, Indonesian Toraja may wonder about becoming “half-crazy” or sliding into a possession trance when grieving (Wellenkamp, 1988).

Identification of emotional symptoms involves mapping sets of changes onto known “constellations” of symptoms that represent locally known forms of distress (Chentsov-Dutton & Ryder, 2019). Once identified as part of a known form of distress, emotions may be understood and regulated within the shared scripts of what one does with such a malady. For example, Nepali widows describe competing sets of models of the boundary between normal and abnormal grief (J. Kim et al., 2017). Many widows indicate that no form of grief is considered problematic; emotional symptoms of grief are understood as normal even when they are prolonged or severe (similar to Maria’s family). Other widows point to symptoms such as excessive crying or long duration as indicators that grief has crossed the boundary between normal and pathological and requires attention. Emotional symptoms that match a locally endorsed script of pathological grief may be regulated differently from those that do not. Although no studies have examined this, people may monitor and regulate their emotions according to accessible cultural scripts (i.e., watching for crying or duration, responding with locally endorsed treatments). More research is needed in this area.

Once emotional discrepancies are detected, people may feel the need to regulate their emotions. This does not imply, however, that emotion regulation would be initiated. First, cultures likely differ not only in which emotions are considered desirable but also in the importance of adhering to such emotion norms. Some evidence suggests that the strength of emotion norms may be higher in more individualistic (vs. collectivistic) cultures (Vishkin et al., 2023). Individuals may be more likely to regulate emotions in a cultural context that emphasizes adherence to emotion norms.

Second, the initiation of emotion regulation may depend on whether people believe emotions can be controlled (Tamir et al., 2007). Such beliefs are associated with distress (e.g., Kneeland, Dovidio, et al., 2016), but whether they vary across cultures has not yet been systematically tested. People who believe emotions are more controllable should be more likely to initiate emotion regulatory attempts when they detect emotional discrepancies (Kneeland, Nolen-Hoeksema, et al., 2016). It is possible that emotion regulation is more likely in cultural contexts that reinforce beliefs about the controllability of emotions, although this awaits empirical testing.

Selection: How Should an Emotion Be Regulated?

When a person is motivated to change their emotions, the selection of strategies can take place. We still know little about the impact of culture on these processes and their links to mental health. Most studies have been done with nonclinical cross-cultural samples. Yet, they indicate that this area of research has importance for mental health. We focus on two emotion regulation strategies relevant to psychopathology: expressive suppression and rumination.

Expressive Suppression

Expressive suppression is a response-focused strategy that involves the restriction of an outward expression of ongoing emotions (Gross & John, 2003). Traditionally, suppression has been understood as a maladaptive strategy, with links to negative mental health outcomes (e.g., depression, social anxiety; Dryman & Heimberg, 2018). Yet, suppression is reinforced in some contexts. In Tigray, Ethiopia, one of the poorest areas in the world with an ongoing war, crying and other expressions of grief are seen as useless and even

physically and spiritually harmful, and suppression is encouraged (Nordanger, 2007). Is suppression always detrimental to psychological health?

Despite early work characterizing it as maladaptive, an increasing number of culturally informed studies demonstrate that the outcomes of suppression vary based on culture. In nonclinical samples, the link between suppression and reduced well-being is moderated by cultural group, with weaker or absent links in contexts that emphasize social harmony and emotional moderation, such as East Asian cultures (Soto et al., 2011). In these contexts, suppression may be more habitual (rather than effortful) and helpful for maintenance of interpersonal bonds; these factors may make it less detrimental for emotional and social functioning (e.g., Schunk et al., 2022; Soto et al., 2011). There is some intriguing evidence that suppression may even provide benefits to those with interdependent values (e.g., Soto et al., 2016).

Cross-cultural studies of suppression with clinical samples are scarce. In one, Arens et al. (2013) compared healthy and depressed Turkish immigrant women living in Germany with German women. The results for healthy participants were similar to previous work, with those from the collectivistic Turkish culture reporting more frequent use of suppression and less negative associations of suppression with well-being. Intriguingly, depressed groups of Turkish and German women did not differ in the frequency or correlates of suppression. Authors argued that this may be due to the universal characteristics of depression that shape outcomes of suppression.

Rumination

There is also some evidence of cultural differences in the use and correlates of rumination. Rumination is an attention deployment strategy characterized by a tendency to repetitively direct attention to negative emotions (Nolen-Hoeksema, 1991). It is considered a transdiagnostic vulnerability factor for psychological disorders (see Watkins & Roberts, 2020). Nonclinical East Asian samples report more frequent rumination, yet it is not as strongly associated with maladjustment in these samples, relative to their WEIRD counterparts (e.g., Tsai et al., 2011; Schunk et al., 2022). This pattern may be due to cultural differences in thinking of rumination as a manifestation of self-doubt versus self-improvement (Choi & Miyamoto, 2022). There are no cross-cultural comparisons using clinical samples, but, in contrast with nonclinical studies, studies with East Asian clinical populations suggest that rumination is linked to psychopathology (S. Kim et al., 2012).

Studies on suppression and rumination hint that the associations of these strategies with adjustment differ across cultural contexts for healthy populations, but not for clinical ones. Perhaps the problematic impact of these strategies depends on the presence of negative mood—that is, attentional and cognitive strategies characteristic of internalizing distress. More research is sorely needed to replicate these findings and extend them to other emotion regulation strategies, like reappraisal.

Implementation: How Is an Emotion Actually Regulated?

One understudied aspect of emotion regulation, in general and in the context of psychopathology, is the implementation of strategies. Context is important to strategy implementation (Aldao & Nolen-Hoeksema, 2012), but the work on cultural context is still lacking. It may be easier to implement emotion regulation strategies that are culturally supported—as such, strategies may be well practiced and scaffolded by others. Future work should focus on this important question.

Conclusion

We have argued that culture affects the links between emotion regulation and mental illness. It is important to scan cultural contexts for models and scripts of normative and pathological emotions and build further bridges between the work in cultural and clinical psychology by examining emotion regulation in clinical samples. We also need to understand the cultural factors (values and beliefs about emotions, scripts of mental illness) that drive the selection, use, and outcomes of emotion regulation strategies.

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SECTION IX

PSYCHOPATHOLOGY

Specific Disorders

CHAPTER 41

Anxiety and Emotion Regulation

AMELIA ALDAO

Anxiety disorders affect 20% of the population (Kessler et al., 2005) and have only become more prevalent following the COVID-19 pandemic (World Health Organization, 2022). So much so, that the U.S. Preventive Services Task Force (2022) recently released a draft recommendation statement calling for universal screening for anxiety in adults under age 65. Anxiety disorders are fundamentally characterized by a vicious cycle of anxiety and avoidance, wherein people demonstrate both an attentional bias *toward* threat, as well as a reduction in processing of the aversive or threatening stimuli itself (Barlow et al., 2002)—that is, people with anxiety disorders notice threat and emotional discomfort sooner, feel it more intensely, and experience strong urges to avoid it at all costs.

For example, after receiving an invitation to a friend's party, Jane begins to worry excessively about making small talk with acquaintances (e.g., "What if I don't know what to say and people think I'm stupid?") and anticipates physical hyperarousal sensations (e.g., heart racing, tension, difficulties concentrating). She then paces around the house, looking for something to wear, worrying that nothing fits her well and feeling the tension continuing to rise. Suddenly, the thought pops up: "What if I don't go?" She begins to consider avoiding the situation, altogether, rationalizing to herself, "I could just stay home, avoid the hassle, and relax . . . it *has* been a long workweek." Avoidance strikes again! Jane stays home and two things happen: (1) she misses out on fun with friends, thereby not experiencing positive social reinforcements; and (2) she becomes more worried about her ability to socialize at parties in the future. Next time there is an invitation, her urge to avoid will get stronger and stronger and she will miss out on many events. Eventually, the invitations will stop coming and there will be nothing left to avoid.

Despite different presentations, this core cycle of avoidant processing repeats itself across the anxiety disorders. For example, Jack has panic disorder, so he experiences anxiety about physical sensations and avoids places that might be associated with previous experiences of panic. Mary has a snake phobia, so she avoids places and activities

that might have snakes, such as trips to the zoo or a hike in the woods with friends. While anxiety disorders can contextually look very different from one another, they are *functionally* quite similar, boiling down to the push and pull of anxiety and avoidance.

Emotion regulation research has further illuminated these avoidance patterns. Meta-analytic work has shown that the anxiety disorders are associated with habitual use of avoidance-based strategies, including worry, rumination, and suppression, and reduced use of approach-based strategies, including reappraisal, acceptance, and problem solving (e.g., Aldao et al., 2010; Schäfer et al., 2017). A recent systematic review of emotion regulation in social anxiety disorder (SAD) shows that people with SAD tend to over-utilize suppression, both habitually and in the moment (Dryman & Heimberg, 2018). In another study with participants with SAD, reappraisal self-efficacy over the course of time-limited cognitive-behavioral therapy (CBT) was found to increase and mediate treatment gains (Goldin et al., 2012). Further, another study showed that, whereas people with SAD utilized cognitive reappraisal to a similar extent as those without, the effectiveness of using this strategy differed across groups (Farmer & Kashdan, 2012).

Much remains to be understood regarding how emotion regulation can specifically facilitate the treatment of anxiety. The gold standard psychosocial intervention for anxiety disorders is CBT, and specifically exposure therapy (Kaczkurkin & Foa, 2015; Stein & Sareen, 2015), which consists of gradually approaching objects and situations that produce anxiety, with the goal of experiencing a reduction in anxiety and/or the urges to avoid (e.g., Craske et al., 2014). Like most evidence-based mental health treatments, exposure therapy is typically expensive and difficult to access (Kazdin & Blasé, 2011). Furthermore, many providers that claim to be trained in CBT do not seem to apply exposure therapy as widely as they should (Hipol & Deacon, 2013; see Deacon et al., 2013; Taylor et al., 2012, for a broader discussion).

Perhaps more problematic, even when clients know to seek exposure therapy, can afford it, and have access to trained providers, they are not guaranteed improvement (Taylor et al., 2012), and even those who do improve might experience relapse (Craske et al., 2014). This issue is at the core of Craske et al.'s inhibitory learning model, which posits that the extinction approach to exposure (i.e., seeking anxiety reduction through habituation) ought to give way to a focus on developing new learning (e.g., expectancy violation, stimulus variability).

So, how can we leverage almost three decades of emotion regulation research to enhance exposure therapy? I propose starting with two common questions that clients—and providers—tend to have. First, how long does exposure therapy take? In other words, what is the optimal *dosage*? And second, what do we do when exposure is not working?—that is, how do we *augment* it?

What Is the Optimal Dosage of Exposure?

To date, the correct dosage of exposure and how this might vary from person to person is unknown. Current practice is predicated on randomized controlled trials (RCTs) that usually last between 12 and 16 weeks in duration—however, most CBT providers can attest to the difficulty of conducting successful beginning-to-end treatment within this amount of time. Therefore, while CBT and exposure are decidedly efficacious for the treatment of anxiety (Kaczkurkin & Foa, 2015), it is unclear the extent to which therapeutic models from these RCTs truly generalize to the complexities of the general population (Taylor et al., 2012).

It is therefore no surprise that one of the trickiest questions that exposure therapists get asked by new clients is “How many exposure sessions until I get better?” And perhaps even more importantly, how many exposure exercises should they be practicing every week? One? Two? Five?

The implications of this question extend beyond helping providers hone treatment planning. In recent years, there has been an influx of venture capital funding toward mental health startups that seek to produce digital therapeutics based on CBT frameworks. These are potentially fruitful endeavors, since they have the potential for reducing gaps in mental health treatment (Kazdin & Blasé, 2011). But, when designing digital interventions, it is essential to get the dosage right *a priori*, during product development.

So, how can we leverage the emotion regulation field to help identify what constitutes an effective dosage of exposure, both in terms of the number of sessions and the extent of practice in between sessions? One way of doing this is by leveraging the framework of *emotion dynamics*, predicated on the notion that emotions constantly fluctuate over time. As such, any meaningful study of emotions ought to consider the systematic modeling of time (Kuppens & Verduyn, 2017). For example, one recent experience sampling study on generalized anxiety disorder (GAD) looked at emotional inertia, calculated via the moment-to-moment correlation of an emotion, to model the way in which emotions carry over time. Participants with GAD tend to have greater inertia with negative emotions, suggesting that their anxiety continuously compounds over time and regulatory efforts to disengage or down-regulate are less successful (Pawluk et al., 2021).

At the core of the emotion dynamics approach is an emphasis on the repeated assessment of emotions over the course of several days and, at times, even weeks. In some cases, sampling occurs at random intervals, in order to capture emotions “in the wild” and, at other times, it can be context dependent, in order to identify the response to a particular stressor. Luckily, with the advancement of technology to collect data (e.g., smartphones, wearable health devices), the growing number of statistical models to analyze such data (e.g., Hamaker et al., 2015), and the influx of monetary resources and potential for research–industry collaborations, conducting such contextual study of emotion changes over time is becoming easier and most cost-effective. Furthermore, Kuppens and colleagues (2022) have recently pointed out that most of the work on emotion dynamics has been largely “descriptive” and, as such, that for this area of work it ought to be more solidly grounded on theory (e.g., exposure).

Thus, the time is ripe to utilize emotion dynamics to help identify the optimal dosage of exposure. Some key questions that could be answered within the existing emotion dynamics framework include:

1. What is the optimal number of sessions until we see a meaningful change? How does engagement in exposure (e.g., number of exercises, duration, peak anxiety) correlate with key treatment outcomes (e.g., decreases in anxiety; fewer urges to avoid; broader repertoire of values-based action; fewer physiological symptoms, such as sleep or gastrointestinal difficulties)?
2. How much exposure practice should clients be doing in between sessions? At what point are these exposures no longer helpful, perhaps because of stress exacerbation or perhaps because of stress inoculation, leaving “going through the motions” of exposures without emotional processing and internalized learning? Without the presence of a therapist, how does avoidance interfere with successful exposure between sessions, and what can be done to minimize this risk?
3. How much exposure practice is needed until therapists can effectively begin to

“wean” off safety behaviors (e.g., those short-term clutches that provide immediate relief from anxiety, but reinforce it over time, such as wearing a “lucky” charm, taking a particular route to work, carrying a benzodiazepine just in case; Helbig-Lang & Petermann, 2010)? And how fast can these safety behaviors be reduced? How much weaning is necessary to maintain treatment gains/prevent relapse? Are *some* safety behaviors OK to hold on to?

4. Are there specific situational contexts in which exposure practice might be more effective? How does this relate to schedule (e.g., work, school, sleep) and physiological changes (e.g., meals, medications, caffeine)? And what about specific emotional contexts that might make exposure easier or more difficult? For example, if clients have a stressful time at work in the morning, they might “carry” with them some stress that might make it more difficult for them to engage in an *in vivo* exposure consisting of taking an elevator (i.e., emotional inertia), or being in a good mood might actually facilitate their engagement (i.e., augmentation; Kuppens et al., 2022).
5. How do individual client characteristics moderate and mediate exposure succession? What are the relevant cultural considerations? How about the client’s emotional flexibility (Bonanno & Burton, 2013)? What role does clinical severity play in these exposure dynamics? What about comorbidities (and cross-avoidance; i.e., when clients do exposures for one of their conditions, but this is inadvertently serving as avoidance of anxiety within the context of another condition)?

How Can We Augment Exposure?

If we are truly seeking to deliver effective therapies for anxiety disorders in a more targeted, expedited, and cost-effective way, we ought to identify both the optimal dosage of exposure and potential mechanisms to augment it. Crucially, this question of how to augment exposure therapy has been the focus of much pharmacological research over the past two decades. Most notably, research has focused on the administration of *d*-cycloserine, which is a partial *N*-methyl-*D*-aspartate agonist that facilitates fear extinction in animals. Recent meta-analytic work suggests it produces a small augmentation effect for exposure therapy, with most reductions in anxiety taking place from pre- to posttreatment, but not extending to follow-up (Mataix-Cols et al., 2017).

A number of studies have also begun to examine nonpharmacological techniques, such as the use of specific emotion regulation strategies. For example, participants instructed to label their emotions before an exposure to public speaking showed reduced physiological arousal compared to those not asked to do so (Niles et al., 2015). In a study from my lab, we recruited participants with elevated contamination concerns and asked them to participate in a behavioral approach task. Those instructed to reappraise the stimulus took more steps toward the feared stimulus than those in the control condition (Wilson et al., 2018).

However, given that this particular type of study focuses on one snapshot moment, it is actually unclear whether this use of strategies is actually helpful. In other words, it is possible that the labeling and reappraisal might have served as “safety behaviors” that allowed participants to gain distance from the emotional experience, without actually experiencing exposure. This is very much aligned with the recent recognition that a putatively adaptive strategy, such as reappraisal, might not always serve an adaptive function

(e.g., Ford & Troy, 2019; see Aldao, 2013, for a broader discussion). There is also a growing recognition that people generally utilize multiple emotion regulation strategies in succession (Aldao & Dixon-Gordon, 2014), a phenomenon referred to as “polyregulation” (Ford et al., 2019).

Once again, it becomes crucial to consider a temporal approach. In this case, we are not yet at the point of espousing the highly nuanced emotion dynamics approach but rather a more parsimonious (and powerful) framework: the process model of emotion regulation—that is, the view that during an emotional episode, such as exposure, emotions can be regulated at five different points in time: situation selection, situation modification, attentional deployment, cognitive change, and expressive suppression (Gross, 1998). As clients approach a feared stimulus or situation during exposure and they go through these phases, they also employ a range of regulatory strategies (i.e., reappraisal, avoidance, suppression). Taking into consideration the important role of temporality, the function of different strategies may change based on the phase of an exposure, in the service of opening up to that experience or working to avoid it. Here are some of the key questions that could be answered by leveraging the process model:

1. At what point in the process do clients begin to disengage from the situation? Are they only going to a party if they know everyone (situation selection)? Are they inviting a friend to go with them (situation modification)? Drinking excessively (attention modification)? Telling themselves that it does not matter (cognitive reappraisal)? Hiding in a corner, head down while scrolling through their phone (suppression)? At each moment, is the strategy (or strategies) they are using bringing them closer or farther away from the experience (e.g., Jazaieri et al., 2015)?
2. To what extent are clients rapidly cycling through strategies (i.e., polyregulation) as a way to disengage from exposure (Ford et al., 2019)? Are they being too emotionally flexible, switching strategies as a form of avoidance (e.g., Aldao et al., 2015; Sheppes et al., 2011)?
3. And, crucially, the effects cannot be measured in the moment—that is, being able to embrace anxiety is important, but we also know from the inhibitory learning model that the goal is not necessarily fear reduction but rather, a broader learning of anxiety and uncertainty (Craske et al., 2014). So, after these exposures, how is cognition changing and through what mechanisms? Are clients more able to reappraise anxiety-provoking situations? Are they able to take on more challenging situations and broaden their repertoire of action? Like in any functional approach, the outcomes need to be delayed in time and result from an accumulation of experiences (Aldao & Christensen, 2015).

Conclusion

Answering the questions posed above will not be straightforward by any means. Rather, it will take an incredible amount of effort and interdisciplinary coordination. But the time has come for the field of emotion regulation to fulfill its destiny of helping advance the field of mental health. It is time for emotion regulation researchers, clinical scientists, and frontline mental health providers to craft a collaborative agenda for the advancement of exposure therapy so that we can move the needle toward more effective, potent, equitable, and cost-effective interventions.

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CHAPTER 42

Depression

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Depression is a psychological disorder that affects roughly one in six individuals and is a leading cause of disability and lost productivity worldwide. This disorder is generally characterized by two hallmark affective features: sustained negative affect and difficulty experiencing and maintaining positive affect. Difficulties in emotion regulation, specifically in down-regulating negative affect (i.e., increased sadness) and, as discussed more recently, in up-regulating positive affect (i.e., decreased happiness), have been proposed to underlie these affective symptoms (Joormann & Stanton, 2016; Liu et al., 2020). Biases in cognition and deficits in cognitive functions (e.g., cognitive control) have been shown to underlie some difficulties in emotion regulation seen in depression (Joormann & Siemer, 2011). Decades of past research, which is reviewed throughout this chapter, suggest that these deficits and biases may not only be a symptom of depression but may also confer vulnerability to developing the disorder. Ongoing research is also examining how these emotion regulation deficits develop and how they can be treated to ameliorate the symptoms of this debilitating disorder.

Emotion regulation, as defined here, is the strategic and automatic process that influences the occurrence, magnitude, and expression of an emotional response. As noted in other chapters in this volume, emotion regulation is a multifaceted dynamic process that can go awry in a multitude of ways (Sheppes et al., 2015). Recent work on emotion regulation in depression has started to acknowledge this complexity and has begun to focus not only on depression-related differences in strategy selection and use but also on differences in flexibility and variability of strategy use, and motivational aspects (such as goals of emotion regulation and beliefs in controllability and malleability of emotions), as well as on a better understanding of underlying (cognitive) mechanisms of emotion regulation difficulties. Also, recent work on emotion regulation

in depression has started to examine the regulation of positive affect in addition to the traditional focus on negative affect.

Rumination and Suppression in Depression

Though it is simplistic to relegate emotion regulation strategies into those seen as “maladaptive” versus “adaptive,” we do know that some strategies incur greater costs than others, particularly for depressed individuals. Research on emotion regulation in depression has therefore traditionally focused on the selection and effectiveness of different strategies. Rumination—an emotion regulation strategy associated with many psychological illnesses—is one such strategy. Rumination refers to the process of perseverative and repetitive attention to specific (often negative) thoughts and is a key feature of depression (see Watkins, this volume, for more information on rumination as an emotion regulation strategy). Rumination has been theorized to reflect a failure of cognitive control in which attention gets stuck on salient but not necessarily goal-relevant aspects of an emotion-eliciting situation (Nolen-Hoeksema, 2000). This strategy is frequently used in response to negative events or affective states, and individuals with depression report perceived positive outcomes of engaging in this process, such as increased self-awareness and self-understanding. Unfortunately, early research by Nolen-Hoeksema (1991) has illustrated that an increased tendency to ruminate on negative information, combined with the difficulties of distracting oneself from such negative material, plays a central role in the maintenance of depressed mood. It is also known that a stable tendency to respond to negative life events and negative mood states with ruminative thinking (a ruminative response style) is a marker of vulnerability for developing depression. Recent work has not only shown that rumination is a transdiagnostic marker of psychopathology but also that it is stable over time (Everaert & Joormann, 2020).

Another emotion regulation strategy that is likened to rumination—particularly in its ineffectiveness at decreasing unwanted negative emotions and its ties to psychiatric disorders—is suppression, or the attempt to inhibit the effects of emotional events on one’s physiological or cognitive internal state (Liverant et al., 2022). Research has indicated that the suppression of emotions is associated with heightened symptoms of depression. Furthermore, emotional suppression has also been linked with increased use of rumination (Bean et al., 2021), suggesting that these two strategies may interact with each other to maintain depressed mood.

Research on both rumination and suppression initially focused on the response to negative affective states (e.g., perseverating on negative emotions; trying to suppress negative mood states)—however, more recent work has also homed in on the tendency to use these emotion regulation strategies in the face of positive affect (see Vanderlind et al., 2020, for a review). Research has illustrated that rumination designed to savor positive emotions is associated with resilience and well-being, but also that depressed individuals are less likely to ruminate on positive events than their never-depressed counterparts (Beblo et al., 2012). Similarly, individuals with a diagnosis of major depressive disorder (as compared to never-depressed controls) report increased suppression of positive emotions, a process that is referred to as “dampening,” and is also linked to depression symptom severity (Beblo et al., 2012). Importantly, dampening of positive emotions appears to be a symptom that persists even after a major depressive episode has remitted, indicating that the tendency to engage in this strategy may be a risk factor for depression, rather

than simply a symptom of the disorder (Hiekkaranta et al., 2021). It is important in future work to more closely examine the relation between depression and regulation of positive affect.

Reappraisal and Distraction in Depression

Rumination and suppression are often contrasted with emotion regulation strategies that are viewed as more effective in reducing the intensity or duration of negative emotions, such as distraction and cognitive reappraisal. As defined in emotion regulation research, distraction refers to the purposeful internal disengagement from an emotional state or event. Though distraction has been shown to be an effective strategy at decreasing unwanted emotions, when compared with nondepressed individuals, those with major depression show a decreased likelihood of using it. In fact, in one study where dysphoric individuals were either instructed to engage in rumination or assigned to a control condition, participants who had ruminated were less likely to engage in pleasant and distracting activities thereafter (Lyubomirsky & Nolen-Hoeksema, 1995). These authors hypothesized that the reduced willingness to engage in distraction may have been due to participants' beliefs that it would interfere with their ability to better understand themselves (through rumination). Other researchers have hypothesized that engaging in distraction may also require more cognitive effort for depressed individuals than engaging in rumination (LeMoult et al., 2016), contributing to its decreased usage as well.

Cognitive reappraisal has a long history in its theorized implications with depression. This emotion regulation strategy refers to the process of reinterpreting an emotion-eliciting event in a way that alters its meaning and, when effective, also changes its emotional impact. Cognitive models of depression suggest that the tendency to make more negative and fewer positive appraisals of emotional events are core features of the disorder. Furthermore, work has suggested that even in the face of ambiguous stimuli (e.g., fictional vignettes, scrambled sentences), depressed individuals form more negative appraisals and interpretations than those who are not depressed, and recent studies have shown that depression is associated with difficulties updating these biased interpretations even in the face of disconfirming evidence (Everaert et al., 2018). It has been suggested that this reduced flexibility occurs due to difficulties with executive function capabilities, such as shifting and updating, which are necessary to inform and change beliefs and interpretations over time (see Snyder, 2013, for a review on depression-related executive functioning deficits).

As reviewed, in individuals with depression, as well as those who have remitted from depression, research has shown an increased tendency to use less effective emotion regulation strategies (e.g., rumination, suppression), and a decreased tendency to use effective emotion regulation strategies (e.g., cognitive reappraisal, distraction; Visted et al., 2018). Depressed individuals demonstrate not only a preferential use of maladaptive strategies, such as rumination, but also difficulties using adaptive strategies, such as reappraisal, which helps to explain how negative emotions in response to life events can quickly spiral into sustained negative mood for those who are dysphoric or depressed (e.g., Nolen-Hoeksema et al., 2008)—however, as has also been highlighted in preceding chapters (e.g., Kalokerinos & Koval, this volume), an understanding of emotion regulation deficits in depression must go further than a simplistic categorization of “maladaptive” versus “adaptive,” or even “ineffective” versus “effective” strategies. Recent work has focused

on other facets of emotion regulation, such as selection of emotion regulation strategies based on context and regulatory goals, and emotion regulation flexibility, which may also be important vulnerability factors for and markers of depression. Exploring the role of these factors more closely in depression research is an important direction for future work that has unique challenges and requires novel research designs and methods.

Strategy Selection and Flexibility

First, it is theorized that depressed individuals differ from their never-depressed counterparts in their ability to select an effective emotion regulation strategy in the moment due to incorrect expectations about different strategies (e.g., how useful one may or may not be) and because of learned/acquired preferences for certain strategies (see Joormann & Siemer, 2014, for a review). For example, numerous studies have shown that the tendency to ruminate in response to negative events is perceived by depressed individuals as a helpful strategy—however, such repetitive negative thinking not only prolongs the negative experience but also impairs solution generation and problem solving, and delays recovery. It is important to consider that these learned preferences (and thus preferential selection of ineffective strategies) may also arise from difficulties implementing a more effective strategy (e.g., inability to carry out positive cognitive reappraisals; Watkins & Nolen-Hoeksema, 2014). Though we know depressed individuals are more likely to use rumination and suppression, it is interesting to note that there are differences in strategy selection even among the more effective emotion regulation strategies, which are unique to depression. Whereas depressed individuals are generally able to employ distraction successfully to decrease negative mood states when instructed, individuals demonstrate a difficult time effectively using cognitive reappraisal (Troy et al., 2010). An extensive body of research (e.g., Sheppes et al., 2009) suggests that reappraisal may be more cognitively demanding and require more resources than distraction, therefore making depressed individuals less likely to attempt the use of reappraisal than those who are psychiatrically healthy. It is important to also consider that depressed individuals may differ from their never-depressed counterparts in their goals for emotion regulation. In fact, recent work by Maya Tamir and colleagues (e.g., Millgram et al., 2015) suggest that individuals with depression may be motivated to select emotion regulation strategies that are more likely to maintain or even increase sadness (see Tamir & Hu, this volume, for more information on emotion regulation goals). In addition, recent studies have examined how beliefs about emotion controllability and malleability may affect the choice of regulation strategies and how this is linked to depression (Kneeland et al., 2020).

Second, it is possible that individuals with depression may possess difficulties in flexibly using the various strategies that might be effective in a given situation and/or have a smaller repertoire of strategies to pick from (Wen et al., 2021). The growing literature on emotion regulation flexibility has proposed that it is a particularly adaptive trait and is central to an individual's achievement of goals (Aldao et al., 2015). Indeed, research has shown that the ability to flexibly switch from an ineffective emotion regulation strategy to one that is more effective in the moment is associated with decreased depressive symptoms (Kato, 2021). Furthermore, flexible modulation of strategy use (e.g., from cognitive reappraisal to distraction) in response to high-intensity negative emotional stimuli is associated with increased neural activity in areas indicative of emotional processing (Dorman Ilan et al., 2019). In more recent work, Chen and Bonanno (2021) identified

latent profiles of regulation flexibility in 1,000 participants and found that inflexible regulators exhibited increased symptoms of both depression and anxiety as compared to medium- and high-flexibility regulators. Emotion regulation flexibility, however, is another domain in which cognitive control may be particularly important, as switching among strategies requires inhibition and disengagement from one ineffective strategy and updating the contents of working memory to attend and engage with another strategy—all of which may be uniquely difficult for individuals experiencing depression-related deficits in executive functioning.

Unfortunately, given current methods, emotion regulation flexibility is difficult to measure as studies generally rely on trait emotion regulation measures, and regulation inductions where participants are instructed to employ a given strategy in a laboratory setting. As such, it remains understudied whether self-reported emotion regulation ability determines state-related and context-dependent strategy usage or their affective outcomes. Measures of current engagement in cognitive processes are still in their nascent (e.g., Brief State Rumination Inventory; Marchetti et al., 2018), as are studies using ecological momentary assessment (see Koval & Kalokerinos, this volume) to measure *in vivo* usage and outcomes, and more research using these methods is necessary to better study regulatory flexibility and affective outcomes.

Implications for Treatment

The core features of depression—sustained negative affect and decreased experience of positive affect—clearly reflect difficulties in the self-regulation of emotional states. As such, cognitive-behavioral treatments for depression have traditionally focused on the identification of maladaptive cognitions and cognitive patterns and the systematic training of reappraisal skills. That said, much of this work has targeted negative affect and negative thought processes. As aforementioned, we know that deficits in recognizing, enhancing, and savoring positive affect are also core features of the disorder and inextricably linked to regulatory deficits (i.e., positive rumination and dampening). Rising treatment programs, such as positive affect treatment (Craske et al., 2019), remain in their nascent, though hold promise at targeting this aspect of depression. In positive affect treatment, depressed patients are not only trained to modify negative thought patterns but a central focus is placed on cognitive biases and strategies to enhance positive affect, such as “augmented behavioral activation training,” “attending to the positive,” and “cultivating the positive.” A randomized controlled trial of this treatment showed not only decreased depressive symptoms over a 6-month period but an increase in positive outcomes over time as well (Craske et al., 2019). This is particularly important as many standard-of-care treatments, such as cognitive-behavioral therapy (CBT) do not significantly change positive affect (Boumparis et al., 2016), though many depressed individuals report the restoration of positive mood as being their primary treatment goal. As such, future research must focus on the further validation and implementation of treatments designed to target the up-regulation of positive affect in depression.

Other promising avenues for treatment include cognitive bias trainings, which have demonstrated efficacy in decreasing rumination and increasing problem-solving skills, and executive control trainings (Hoorelbeke et al., 2021), which may be useful augmentations to current treatment regimens (Lass et al., 2021). Given the importance of emotion regulation flexibility, and the executive control functions that are necessary for carrying out the flexible modulation of strategy use, focus on executive and cognitive control

warrants closer investigation as a helpful and beneficial treatment for depression. Last, focus should be placed on deficits in regulatory motivation and beliefs about emotion overall that may persist in depression. Given work showing that depressed individuals may show a preference to maintain negative affect—perhaps due to distorted beliefs about what might occur if their affective state changes—this may be an important place to begin, before targeting the use of regulatory strategies themselves.

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CHAPTER 43

The Challenge of Emotion Regulation in Bipolar Disorder

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Which of my feelings are real? Which of the me's is me? The wild, impulsive, chaotic, energetic, and crazy one? Or the shy, withdrawn, desperate, suicidal, doomed, and tired one? Probably a bit of both, hopefully much that is neither.

—KAY REDFIELD JAMISON, *An Unquiet Mind* (1996, p. 85)

Bipolar disorder (BD) is a serious and profoundly impairing psychiatric disorder ranked among the top 10 causes of disability worldwide (World Health Organization, 2001). BD is characterized by episodic mood shifts between periods of abnormally elevated and persistent positive mood or *mania* and, often, periods of intense low mood and loss of pleasure or *depression* (American Psychiatric Association, 2022). Those with BD are at increased risk of comorbid psychiatric and medical conditions, such as substance abuse and cardiovascular disease (e.g., Fagiolini et al., 2005), alongside higher rates of unemployment, homelessness, social strain, divorce, and mortality (e.g., Ayano et al., 2019; Zimmerman et al., 2010).

The profound costs of dysregulated, extreme, and expansive emotions are perhaps nowhere more evident than in BD, which has been termed a *poster child* of emotion dysregulation (e.g., Dodd et al., 2019; Johnson et al., 2007). Those whose lives are touched by BD have experienced the intoxicating, chaotic highs of mania; the dark despair of depression; and the frightening, volatile shifts and mixes between the two (American Psychiatric Association, 2022). The intensity of emotions in BD can be staggering, and the costs of unsuccessful emotion regulation (ER) can be enormously destabilizing: pride and excitement at the birth of one's first child can be a harbinger of another destructive manic episode, whereas sadness at the loss of a romantic relationship can precipitate another wave of depression. In short, the challenges of ER in BD are palpable. We briefly summarize what is known about ER in BD (see Table 43.1). Looking ahead, we emphasize

TABLE 43.1. What Is Known about the Puzzling Gap between Intact ER Abilities and Challenges with ER Achievement in BD

Intact ER abilities (in laboratory)	Challenges with ER achievement (in everyday life)
Successful implementation of ER strategies when cued (e.g., reappraisal)	Tendency to amplify emotions
Select context-appropriate ER strategies using forced choice	Compromised behavioral control over emotions (e.g., emotion-relevant impulsivity) Greater reported ER efforts Lower reported ER success Decreased connectivity in ER brain networks

the need to capture interpersonal contexts and developmental trajectories, and expand to diverse cross-cultural perspectives to more fully understand ER in BD.

A Puzzling Gap in ER in BD

Empirical research has documented profound emotional difficulties in BD. With respect to ER, the core focus of this chapter, a robust line of research demonstrates that people at risk for and diagnosed with BD experience ER difficulties. These are apparent in at least four domains, including (1) the tendency to preemptively amplify emotions, (2) compromised behavioral and cognitive control over emotions, (3) greater expended ER effort, and (4) low reported success at regulating emotions. These problematic ER patterns in BD may be understood through altered activity and function of brain networks involved in effective ER (Nusslock & Alloy, 2017). We describe supportive evidence for these four domains of ER difficulties below.

We note that BD is also associated with related challenges in *emotion reactivity*, defined as an increase in the magnitude of emotion responding. Individuals at risk for and diagnosed with BD self-report greater positive emotion intensity and duration and exhibit increased physiological reactivity to positive emotionality that persists across positive, neutral, and negative contexts (e.g., Farmer et al., 2006; Gruber, 2011). Other work suggests elevations in negative emotions in BD, particularly when depressive symptoms are present (Johnson et al., 2016). Although teasing apart regulation from reactivity is complex and beyond the scope of this brief chapter, future work should aim to disentangle the timing and way in which heightened emotional responses in BD contribute to subsequent challenges managing emotions, and vice versa.

ER Challenges

A growing literature supports difficulties in ER in BD. First, individuals with BD self-report a tendency to engage in strategies that *amplify positive emotions*, such as rumination, which involves mulling over the causes and consequences of one's feelings in a way that enhances emotion intensity but does not promote problem solving (e.g., Gruber et al., 2011; Johnson et al., 2008). These tendencies to amplify emotions track real-world functioning in BD in important ways. On the one hand, some aspects of experienced positive affect are, unsurprisingly, associated with higher-functioning BD adults (Johnson et

al., 2016). On the other hand, amplifying already heightened positive emotions can be highly problematic for those with BD, potentially contributing to episodes of behavioral dyscontrol (e.g., risky sexual activity, substance abuse) and feeding the ascent into manic episodes. Relevant work has found that the self-reported extreme pursuit of positive feelings, such as happiness (e.g., “How happy I am at any given moment says a lot about how worthwhile my life is”), is also associated with increased risk for BD in student samples, a clinical diagnosis, and a greater number of prospective manic episodes over a 12-month period among BD adults (Ford et al., 2015).

Second, a related literature on *emotion-relevant impulsivity* (or urgency) shows that BD adults exhibit more risk-taking behavior in the throes of heightened emotion states compared to nonpsychiatric controls (e.g., Muhtadie et al., 2014). For example, in response to heightened positive and negative emotions, individuals with BD are more likely to engage in excessive alcohol and substance use, reckless driving and spending, sexual promiscuity, and aggression—even during periods of remission (i.e., not symptomatic). In other words, there is evidence of *compromised ER control*, with significant costs to BD individuals.

Third, BD individuals *report greater spontaneous ER effort*. For example, interepisode BD adults self-report greater use of both putatively adaptive (e.g., reappraisal) and maladaptive (e.g., suppression) strategies while watching emotional films in the laboratory (Gruber et al., 2012). Interepisode BD adults also report greater use of various ER strategies—including reappraisal, calming, suppression, and distraction—across a 1-week period compared to controls in an experience sampling study (Gruber et al., 2013). Moreover, greater self-reported risk for BD across college and familial risk samples is associated with greater tendencies to amplify and dampen positive emotions using self-report trait-based ER scales (McGrogan et al., 2019).

Despite these pronounced efforts to regulate, people with a diagnosis of BD also *report less success* in regulating their emotions (e.g., Gruber et al., 2012, 2013). One possibility is that greater emotional reactivity in BD may produce both a heightened need for and a greater challenge with regulation. Another possibility is that adults with BD may be more indiscriminate or less goal directed in their use of ER, potentially leading to strategy use that is poorly suited to the situation or their long-term goals (cf. Wenzel et al., 2020). These difficulties in ER are hypothesized to arise in part from alterations in important brain or neural regions thought to support successful ER (e.g., Nusslock & Alloy, 2017; Phillips et al., 2008)—however, future research is needed to address this question of the effort–success gap in BD (Gruber et al., 2023). In sum, current research suggests that BD is associated with greater ER effort and strategy use, but in a way that is ultimately not successful and may be driven by aberrant processes in reward-relevant and cognitive-control brain networks.

ER Capabilities

Alongside these challenges, a parallel line of findings suggests intact regulation abilities in more controlled laboratory settings, including the (1) selection of context-appropriate strategies in the laboratory, and (2) ability to effectively implement well-known ER strategies when cued. Below we describe this puzzling gap between problems in ER in everyday life versus intact ER ability in BD when cued.

First, those with BD do frequently select context-appropriate ER strategies in controlled laboratory settings using forced-choice tasks. For example, interepisode BD adults chose context-appropriate regulation strategies (e.g., distraction in high-arousal settings,

reappraisal in low-arousal settings) similar to a nonpsychiatric control group when viewing emotional images on a well-validated ER choice paradigm (Hay et al., 2015).

Second, individuals with BD demonstrate the *ability to regulate when cued* with well-validated ER strategies at levels comparable to healthy controls. For example, interepisode adults with BD successfully understand and implement cognitive reappraisal (thinking about a situation differently in order to alter its emotional impact) to reduce self-reported and physiological responses to emotionally evocative film clips (Gruber et al., 2011, 2012). Similarly, when recalling positive autobiographical memories using a cognitive distancing technique (i.e., recalling the emotional memory from a distanced third-person reflective perspective), interepisode adults with BD successfully down-regulated the intensity of positive emotional responses similar to healthy adults (Gruber et al., 2009). Finally, when instructed to use more cognitively complex mindfulness-based techniques (focused on adopting a present-focused and nonjudgmental attitude), once again interepisode BD individuals reduced the intensity of their positive emotional responses in response to a goal-induction task (Gilbert & Gruber, 2014). Taken together, these findings suggest that those with BD possess the ability to regulate emotions using complex strategies across different contexts when cued in controlled laboratory settings (Gruber et al., 2012).

In summary, current research on ER in BD reveals a puzzling gap: Individuals with BD (even when not currently manic or depressed) report emotion-related difficulties in everyday life and when regulating spontaneously in the laboratory. Yet these individuals also demonstrate an intact ability to effectively regulate emotions when instructed, selecting and implementing context-appropriate and adaptive ER strategies in the laboratory. The challenge and the promise of ER in BD thus involves leveraging intact cued ER abilities to effectively deploy ER skills in everyday life.

Implications for Clinical Interventions

A critical question is whether this basic research is translatable into effective interventions. After all, it has been suggested that ER may be a key predictor of psychosocial functioning and quality of life in BD (e.g., Van Rheenen & Rossell, 2014). Certainly, mood regulation is a central goal of BD-relevant treatments—however, many psychological interventions for BD do not explicitly target ER nor has it been assessed as a common outcome or mediator of BD treatments.

Currently, there is some evidence that clinical interventions can enhance ER in people with BD. Most notably, several studies have reported that participation in dialectical behavior therapy or mindfulness-based cognitive therapy was associated with decreased self-reported affective reactivity, lability, or dysregulation (e.g., Deckersbach et al., 2012)—however, extant studies have been small and have not yet yielded clear evidence that observed changes are associated with changes in mood symptoms, relapse risk, functioning, or quality of life.

One intriguing example of an attempt to translate emotion theory and research more directly comes from a recent proof-of-concept study of an intervention for BD designed to reduce emotion dysregulation and enhance the valuation of low-arousal positive emotions (Painter et al., 2019). Components included psychoeducation about emotions, savoring positive experiences, and cognitive reappraisal, among others. Participation in treatment was associated with self-reported decreased experienced high-arousal affective states and increased reappraisal efficacy (Painter et al., 2019); as above, though, this was a small, preliminary study. In summary, ER is a promising treatment target in BD with

the need for larger clinical trials, more active controls and cross-treatment comparisons, and process analyses.

Limitations and Looking Ahead: Capturing Interpersonal, Lifespan, and Diverse Contexts

Despite recent research advances in ER in BD over the past few decades, there are several notable limitations. Most of the research has been conducted during the interepisode period, which tells us about enduring ER tendencies among those with BD. It is reasonable to suspect, for example, that targets and directions of ER during various phases of BD may have important clinical implications. Yet, surprisingly few studies have examined links between ER and clinical outcomes longitudinally or during acute mood episodes (Dodd et al., 2019). More research is needed that examines ER during active manic and depressive episodes. Insights from such research could inform treatment targets and strategies across the course of BD. Looking ahead, we highlight three key avenues for future research, including capturing interpersonal contexts and developmental trajectories, and more diverse cross-cultural perspectives, to expand our understanding of ER in BD with a wider, more inclusive, and more integrative lens.

Interpersonal Regulation

Whereas research on ER has historically focused on intrapersonal ER, recent conceptual and empirical advances have highlighted the importance of interpersonal ER, whereby people engage in goal-directed social interactions to change how they or another person is feeling. Certainly, interpersonal factors have been found to play an important role in BD. For example, multiple longitudinal studies have reported that familial expressed emotion (i.e., criticism, hostility, and emotional overinvolvement) and perceived social support are related to course of illness (e.g., Studart et al., 2015). In light of the evidence reviewed above suggesting that people with BD may be more effective at ER when strategy use is cued, an intriguing possibility is that people with BD may benefit from interpersonal compared to intrapersonal ER-focused approaches. On the other hand, BD is also associated with profound interpersonal challenges—including disruptions in interpersonal relationships, lack of social support, and stigma—that might interfere with the availability or effectiveness of interpersonal ER in practice.

Developmental Lifespan Trajectories

It has been suggested that early difficulties in ER may be a marker of risk for the development of BD (e.g., Luby & Navsaria, 2010). Yet, surprisingly little is known about the developmental trajectories of ER in BD. Cross-sectional studies of youth at high risk for BD (i.e., children with a first-degree relative diagnosed with BD), as well as those of children diagnosed with pediatric BD, have reported group-level differences in various affective processes, such as higher intensity and persistence of anger and irritability (e.g., Tseng et al., 2015) and lower accuracy on affective interference tasks (see Khafif et al., 2021, for a meta-analysis), compared to lower-risk and nondiagnosed youth. Whereas such observations are frequently discussed in terms of ER, research in this area has rarely used direct ER methods or measures, and there is a paucity of longitudinal data available. Greater work is needed that bears on the question of lifespan development of ER profiles in people with BD and that focuses specifically on ER in older adults with BD.

Inclusive and Cross-Cultural Research

Given sociocultural influences on the way emotions are experienced, valued, expressed, and regulated, it is logical to postulate that the nature of ER in BD is affected by cultural context. However, ER in BD has not been examined sufficiently cross-culturally or intraculturally across diverse racial/ethnic groups. Current knowledge on ER in BD is dominated by research conducted in a Western context, consisting of majority White college-educated samples. To promote equity in BD treatment and ensure that research findings are relevant to individuals living with BD, it is essential for future research on ER in BD to expand its scope to more diverse communities and contexts, both intraculturally and cross-culturally.

Concluding Comments

Amid the considerable challenge of ER in daily life, evidence that BD individuals retain effective ER skills in the laboratory is a source of hope and is scientific as well as clinical inspiration. As a relatively nascent literature, there exist several key avenues for future research that can move us closer to uncovering the puzzling gap between the challenges and capabilities of ER in BD.

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CHAPTER 44

The Role of Emotion Regulation in Substance Use Disorders

STATE OF THE SCIENCE AND NEXT STEPS

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Consuming substances, such as alcohol, cannabis, cocaine, nicotine, and opioids, can produce rapid and powerful changes in how a person feels. Individuals often turn to substances to either decrease, increase, or sustain emotional states, including negative affect (e.g., anxiety, sadness, anger, stress), positive affect (e.g., joy, calm, love), and substance craving (Kober, 2014). Substance use, including use that is motivated by the desire to change one's emotional state (e.g., to relieve stress or to increase enjoyment at a social event), is common and not necessarily problematic. However, individuals can develop a substance use disorder (SUD), defined as a pattern of problematic substance use characterized by impaired control, physical dependence, psychosocial problems, and/or risky use (American Psychiatric Association, 2022).

A large body of empirical research indicates that emotion regulation (ER) difficulties underlie the development and maintenance of SUDs (Cheetham et al., 2010; Kober, 2014; Weiss, Kiefer, et al., 2022). Indeed, substance use itself can be viewed as a maladaptive ER strategy (Kober, 2014). In this chapter, we review the state of the scientific literature on ER and SUDs. First, we focus on the role of craving and regulation of craving in SUDs. We posit that craving is an emotion and that regulation of craving is a core component of ER among individuals with SUDs. Second, we focus on the roles of negative and positive affect and their regulation in SUDs. We conclude by focusing on future directions.

The Role of Craving and Its Regulation in SUDs

Craving is defined as a strong desire for substances (American Psychiatric Association, 2022). Although researchers recognize that craving has an emotional component, craving

is still not consistently conceptualized as an emotion itself. We posit that substance craving is an emotion (Giuliani & Berkman, 2015). ER experts define an emotion as a psychological state that (1) consists of loosely coupled patterns of subjective experience, physiology, and behavioral response tendencies; (2) fluctuates relatively frequently over time; (3) is triggered by internal and external cues; and (4) serves an evolutionary function to motivate situationally appropriate action. By this definition, craving is an emotion because craving (1) involves the subjective experience of wanting, physiological changes (e.g., activation of the ventral striatum; increases in blood pressure, respiration, and salivation), and behavioral urges to use substances (Ray & Roche, 2018); (2) fluctuates many times within the same day (Ellis et al., 2022); (3) is triggered by internal and external cues (Skinner & Aubin, 2010); and (4) serves the function of promoting the attainment of resources that increase survival and adaption to the environment (Panksepp et al., 2002).

Craving is a core symptom of SUDs and is linked with a range of internal and external cues via classical and operant conditioning (Skinner & Aubin, 2010). Craving was added as a diagnostic criterion for SUD in the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition* in 2013 (DSM-5; American Psychiatric Association, 2013). Critically, substance use relieves craving, and craving is a robust predictor of substance use. In a meta-analysis conducted by our group, we found that craving and cue reactivity (i.e., physiological and neural responses to cues paired with substance use), on average across 656 statistics, from 237 studies, representing 51,788 human participants, had a significant prospective positive association with substance use (odds ratio of 2.05; Vafaie & Kober, 2022). Moreover, craving prospectively predicted substance use across all craving measures (e.g., multi-item craving questionnaires, single-item measures, and especially cue-induced craving), substance types (e.g., alcohol, cannabis, cocaine, nicotine, and opioids), and substance use assessment methods (e.g., retrospective self-report questionnaires, ecological momentary assessment reports).

Further, a recent study using ecological momentary assessment showed that craving, relative to negative and positive affect, is more consistently a proximal and prospective predictor of same-day substance use (Burgess-Hull & Epstein, 2021). These data suggest that craving may play a greater role in precipitating momentary substance use than positive and negative affect.

In our view, ER includes the regulation of craving (Kober, 2014). Indeed, a substantial body of literature demonstrates that the strategies individuals use to regulate substance craving play a critical role in substance use behavior. For example, studies to date suggest that cognitive reappraisal, mindful acceptance, distraction, stimulus control, arousal reduction, seeking social support, and drug refusal are effective strategies for reducing substance use across types of SUDs (Roos et al., 2021; Roos, Kober, et al., 2020).

Research on treatment for SUDs further suggests that regulation of craving may be a core mechanism of recovery. Studies suggest that the therapeutic effects of behavioral therapies for SUDs may be driven by improvement in regulation of craving (Witkiewitz et al., 2013). Regulation of craving is the primary target of many leading behavioral therapies for SUDs, including cognitive-behavioral therapy (CBT) and mindfulness-based therapy (MBT). CBT teaches strategies to manage cravings, such as cognitive reappraisal, distraction, stimulus control, arousal reduction, seeking social support, and drug refusal. Emerging research using our “Regulation of Craving” (ROC) task suggests that CBT may enhance the regulation of craving primarily via a “top-down” process that enhances cognitive control over craving, via greater recruitment of the prefrontal cortex (e.g., Kober et al., 2010; Suzuki et al., 2020).

In contrast, MBT has a targeted focus on acceptance of craving. Further, studies suggest that MBT may enhance regulation of craving primarily via a “bottom-up” process in which reactivity to cues and craving is reduced, as indicated by less activation in regions associated with cue reactivity and craving, without co-occurring increases in prefrontal cortex activation (Kober et al., 2017, 2019; Westbrook et al., 2013).

Given the central role for the regulation of craving in SUDs, we recently developed a brief standalone digital intervention focused solely on training in ROC, and have shown that it leads to reduced substance use (ROC-T; Lopez et al., 2022).

The Role of Negative Affect and Its Regulation in SUDs

Substances can provide potent temporary relief from negative affect. Hence, many theories posit that negative affect and its regulation play key roles in SUDs (McHugh & Kneeland, 2019). Elevated negative affect and co-occurring emotional disorders (e.g., posttraumatic stress disorder, depression, anxiety) are prospective predictors of greater substance use over time (e.g., months or years; Bradizza et al., 2006). Ecological momentary assessment studies suggest that negative affect may play an indirect role in driving momentary substance use in daily life. Specifically, these studies show that negative affect predicts greater craving, which in turn predicts substance use (Burgess-Hull & Epstein, 2021; Wemm et al., 2019).

Difficulty regulating negative affect is consistently associated with greater substance use, whether assessed as (1) infrequent use of adaptive strategies (Roos, Bowen, et al., 2020); (2) frequent use of maladaptive strategies (Aldao et al., 2010); or (3) deficits in trait-level ER abilities, such as awareness, understanding, and acceptance of negative emotions, and engaging in conscious, goal-oriented behaviors when distressed (Weiss, Kiefer, et al., 2022); and (4) elevations in trait-level emotional vulnerabilities, such as distress intolerance (Mattingley et al., 2022), anxiety sensitivity (Wolitzky-Taylor et al., 2018), negative urgency (Smith & Cyders, 2016), and stress reactivity (McHugh & Kneeland, 2019). However, most of this research has used retrospective self-report questionnaires.

Importantly, studies suggest that behavioral therapies for SUDs may exert their therapeutic effects—at least in part—via reducing negative affect and improving negative affect regulation (Kober et al., 2017; McHugh & Kneeland, 2019; Roos, Bowen, et al., 2020). CBT typically targets negative affect regulation strategies, such as problem solving, arousal reduction, communication skills, cognitive reappraisal, and seeking social support. MBT typically targets awareness, understanding, and acceptance of negative affect (Roos, Kober, et al., 2020).

The Role of Positive Affect and Its Regulation in SUDs

Substances are often used to induce, maintain, or enhance positive affect. Indeed, many theories posit that positive affect and its regulation underlie SUDs (Garland, 2021). Research indicates that positive affect plays a complex role in SUDs. For instance, the role of positive affect varies depending on whether it is assessed at the trait level or momentary level. Higher trait-level positive affect (e.g., average levels over time) appears to be a protective factor that reduces substance use (Emery & Simons, 2020). Relatively, anhedonia, or a dispositional difficulty experiencing pleasure, is a risk factor in the

development and maintenance of SUDs (Kiluk et al., 2019). These findings are consistent with the notion that the ability to consistently experience positive affect over time may be crucial in preventing individuals from turning to substances to induce positive affect (Garland, 2021). On the other hand, individuals may turn to substances to maintain or amplify levels of positive affect, such as during social gatherings. Consistently, studies using ecological momentary assessment indicate that intraindividual increases in momentary positive affect predict greater momentary substance use (Emery & Simons, 2020).

Adding to the complexity, the role of positive affect may depend on problem severity. Research suggests that high positive affect (particularly as a momentary state) may play the greatest role in driving substance use among individuals at the “early-onset” or “risky-use” stages relative to individuals with SUDs (Cheetham et al., 2010). Furthermore, research suggests that low trait-level positive affect may play the greatest role in driving substance use among individuals with relatively more severe SUDs (Garland, 2021).

Researchers have assessed a variety of constructs related to positive affect regulation. Studies indicate that several aspects of difficulties in positive ER are associated with greater substance use, including (1) infrequent use of adaptive strategies, such as positive reappraisal, mindful awareness, and savoring (Garland, 2021); (2) use of dampening as a positive down-regulation strategy (e.g., “This is too good to be true”; Peckham et al., 2020); (3) trait-level positive urgency, or the tendency to respond impulsively to positive emotions (Smith & Cyders, 2016); and (4) other difficulties regulating positive affect, such as nonacceptance of positive affect (e.g., feeling guilty for feeling happy; Weiss, Brick, et al., 2022).

Research suggests that improvements in positive affect regulation may mediate the effect of—at least some—behavioral therapies for SUDs (Garland, 2021). CBT for SUD typically targets positive affect regulation strategies, such as behavioral activation, goal setting, changing social networks, and positive reappraisal, whereas MBT targets mindful awareness, savoring, and values clarification.

Future Directions

Applying Existing ER Frameworks to Understand Regulation of Craving

When craving is conceptualized as an emotion, researchers can apply existing ER theoretical frameworks to better understand regulation of craving in SUDs (Giuliani & Berkman, 2015). For example, the extended process model of ER (see Gross, this volume) may be useful for categorizing regulation of craving strategies. Applying the ER ability model (Gratz et al., 2015) to regulation of craving could facilitate the development of a measure similar to the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004) that taps into core difficulties in regulating craving (e.g., lack of recognition, nonacceptance, lack of strategies). Applying more recent ER frameworks (Southward et al., 2021) could advance our understanding of the nuances of regulation of craving related to repertoire shifts and ordering of strategies in specific contexts.

Use of Intensive Longitudinal Measurement

Most research on the role of ER in SUDs has used global, retrospective self-report questionnaires or laboratory/experimental tasks. Further use of intensive longitudinal

measurement methods, such as ecological momentary assessment, is needed to elucidate the dynamic role of ER in varying situational contexts. We provide recommendations for applying intensive longitudinal measurement to study ER in SUDs (Roos, Kober, et al., 2020; see also Koval & Kalokerinos, this volume).

Integration of ER Measurement into Intervention Studies

Some progress has been made in understanding ER as a mechanism of change in SUD interventions (Roos et al., 2021)—however, many important questions remain: What are the common and unique ER mechanisms of change across varying intervention approaches (e.g., CBT vs. MBT)? Are certain ER strategies particularly effective for certain SUD subtypes, or in specific situational contexts in daily life? And what are the key obstacles and facilitators of improvements in ER among individuals with SUDs? Further research aiming to answer these questions has the potential to refine SUD interventions and inform the development of novel interventions.

Dynamic Associations between Substance Use and ER over Time

Many theories posit a vicious cycle in which substance use itself may have detrimental effects on subsequent ER (Kober, 2014). At the proximal level, momentary substance use is thought to impair momentary decisions related to ER. Heavy substance use may prompt next-day withdrawal symptoms that in turn impair next-day ER ability. Moreover, it is thought that chronic heavy substance use over extended periods of time may impair functioning in the prefrontal cortex, which in turn may substantially undermine the ability to engage in “top-down” regulation of emotion states (Kober, 2014). More longitudinal studies, particularly those applying neuroimaging and intensive longitudinal measurement, are needed to evaluate these hypotheses.

Understanding ER across the Stages of Substance Use

Researchers have posited that the initial use of substances may be primarily motivated by a desire to increase positive affect and/or decrease negative affect, whereas later stages of substance use may be primarily motivated by a desire to decrease craving or other symptoms of withdrawal (Cheetham et al., 2010). Further research is needed to explicitly test this hypothesis and to understand how deficits in the ability to regulate distinct affective states may play unique roles across the stages of substance use.

Nuanced Assessment of Emotional States

Most studies examining the role of craving, negative affect, and positive affect in SUDs measure these states in a global manner (e.g., total scores)—however, total scores may obscure important nuances, such as physiological versus cognitive dimensions of emotion, low- versus high-arousal emotions, and types of negative emotions (e.g., sadness, anxiety, anger, shame, loneliness) or positive emotions (e.g., excitement, contentment, gratitude, fulfillment, calm). Future research is needed to explore these nuances, including research using intensive longitudinal methods. The field may need to move beyond the categorization of “positive” versus “negative” emotions, which may provide limited insight on the complex role of emotions and their regulation in SUDs.

Research on ER among a Wider Variety of SUD Types

Literature on the role of ER in SUDs has been predominantly among individuals with alcohol, cannabis, or tobacco use disorders. More research is needed to investigate the role of ER among individuals with other SUDs (e.g., cocaine, opioid, benzodiazepine use disorder), as well as individuals using multiple substances.

Conclusion

Taken together, ER plays a critical role in SUD, including the regulation of craving and the regulation of negative affect and positive affect. Notably, recent research suggests that relative to negative and positive affect, craving may be a more consistent proximal precipitant of substance use. Hence, we believe it is time for the field to pay even closer attention to regulation of craving in SUDs. This means conceptualizing craving as an emotion and applying existing ER frameworks to study regulation of craving. Continued investigation of ER in SUDs is an integral part of the SUD field's effort to improve treatment for SUDs.

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CHAPTER 45

Emotion Regulation in Individuals on the Autism Spectrum

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Autism spectrum disorder (ASD) is a lifelong neurodevelopmental condition characterized by tremendous variability with respect to specific symptom presentation, severity, and course across the lifespan. According to the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision* (DSM-5-TR; American Psychiatric Association, 2022), people on the autism spectrum experience social and communication challenges, difficulties with developing and maintaining relationships, show restricted and repetitive patterns of behaviors and interests, and are hyper- or hyporeactive to sensory stimuli. In addition to heterogeneity in the core diagnostic symptoms, there is high variability in cognitive and adaptive functioning, academic and employment outcomes, and support requirements (e.g., Hedley et al., 2017).

It is not uncommon for people on the spectrum to be diagnosed with co-occurring mental illnesses, such as anxiety and depression (Lai et al., 2019). The increased occurrence of mental health issues has been attributed to emotion regulation (ER) difficulties often observed in the autism population (Cai et al., 2018). This hypothesis has been further supported by recent empirical evidence demonstrating that ER is a transdiagnostic process that underlies poor mental health outcomes across various clinical and normative samples (Cai et al., 2021). Although ER is not a core feature of ASD, different aspects of the autism phenotype are associated with ER difficulties (Berkovits et al., 2017): the restricted and repetitive behaviors, interests, and activities domain showing the strongest links (Samson et al., 2014). Due to the congruous finding of ER problems across the lifespan, researchers have gone as far as to suggest that poor ER may be inherent in people on the spectrum (Mazefsky & White, 2014). In the following sections, we aim to link existing autism literature to the extended model of ER (Gross, 2015; Gross, this volume), to identify points in the four phases of ER (identification, selection, implementation, and monitoring), where issues may arise for those on the spectrum. We hope that this novel

lens of reviewing the literature allows us to better characterize ER in ASD and highlight gaps in the existing research.

ER Difficulties in ASD

Adaptive or skillful ER requires implicit and explicit knowledge about ER—for example, knowing which strategy is more efficacious and appropriate in relation to a specific context, and taking into account the type and intensity of an emotion, as well as the resources available. These abilities all require high flexibility, which may be challenging in the context of higher negative affectivity. Indeed, despite high variability in emotional reactivity in people on the spectrum, a recent systematic review found that children and adolescents with ASD have higher negative affectivity than those typically developing (Chetcuti et al., 2021).

Evidence shows that individuals on the spectrum differ in their ER profile from those without autism. For example, young children on the spectrum tend to have poorer ER abilities and use simpler and less effective ER strategies, such as venting during times of distress, than typically developing children (Cibralic et al., 2019). Similarly, adults tend to report using more ER strategies traditionally considered maladaptive in the general and other clinical populations because they are associated with worse outcomes, such as poorer mental health (e.g., expressive suppression) and fewer strategies commonly considered adaptive (i.e., associated with better outcomes), such as cognitive reappraisal (Samson, Hardan, et al., 2015; Samson, Wells, et al., 2015).

Identification Stage

Some of the ER difficulties observed in people with ASD may be caused by breakdowns in the identification stage of the ER cycle. The first step in this stage is detecting one's own emotions. One way of researching people's ability to detect their own emotions is through alexithymia (i.e., people's difficulties with identifying, differentiating, and describing emotions; Preece & Sikka, this volume). Researchers have suggested that alexithymia causes the emotional impairments observed in ASD and reduces people's ability to regulate difficult emotions (Bird & Cook, 2013). Indeed, a recent empirical study found a moderate association between alexithymia and emotion dysregulation in ASD (Gormley et al., 2022). Although a much higher proportion of people with ASD have alexithymia than those without (Kinnaird et al., 2019), alexithymia is not universal in ASD, which suggests that other impairments may lead to ER difficulties.

Difficulties with ER may also arise at later processes of the identification stage, such as our beliefs about emotions and their malleability (Ford & Gross, 2019). People predominantly aim to down-regulate negative emotions and are more willing to accept positive emotions because we tend to place a positive value on pleasant emotions and believe positive emotions are better than negative ones—however, a higher proportion of people with ASD than those without down-regulate positive emotions' intensity (Cai et al., 2020), which suggests that positive emotions may be valued negatively in some individuals, perhaps because they find strong positive emotions too arousing and unpleasant.

Moreover, Gross (2015) suggested that one way that ER difficulties may occur at the identification stage is via psychological inertia—the tendency to continue acting as one has previously. Interestingly, people with ASD have begun to use the term *autistic inertia* to describe their difficulty in acting on their intentions, with potential causes being motor

difficulties, poor mental health, and executive functioning impairments (Buckle et al., 2021). We hypothesize that executive functioning impairments coupled with high levels of insistence on sameness observed in people with ASD are likely to lead them to be stuck in psychological inertia and not activating goals to regulate emotions.

To summarize, there is mounting evidence for alexithymia in ASD and alexithymia impacting effective ER. Other aspects within the identification stage need further exploration, such as beliefs about malleability, valuing positive emotions differently, and the role of psychological inertia.

Selection Stage

Once people set a goal to alter their current emotional state, they must first access their mental representation of ER strategies. Based on the developmental stage and past experiences, one may have a more limited or broader mental representation. Research has shown that the ER strategy repertoire broadens from childhood to adolescence and adulthood, beginning with behavioral strategies to increasingly include cognitive strategies (Riediger & Bellingtier, 2022). The evidence that children with ASD employ less sophisticated ER strategies than typically developing peers indicates a delay in ER development (Nuske et al., 2017). Similarly, a systematic review concluded that individuals on the spectrum might have a different repertoire of ER strategies to choose from, including more maladaptive ones (Cibralic et al., 2019). Preliminary evidence indicates no difference between those with and without ASD in the number of strategies used for every regulation moment (Cai et al., 2020). Hence, it may not be the number of strategies that is the issue in ASD but rather the types of strategies selected.

After the representation of strategies is brought to mind, a person needs to evaluate them in relation to various contextual factors (e.g., Sheppes, this volume). A combination of high anxiety and executive functioning problems in many people with ASD may lead to reduced cognitive resources, which may be one of the reasons why individuals more frequently choose less cognitively taxing ER strategies, such as avoidance or distraction. We also know that at high-intensity levels, cognitive reappraisal is not as effective (Sheppes, this volume). Indeed, several studies have shown that people on the spectrum use cognitive reappraisal less frequently than those without ASD (Samson, Hardan, et al., 2015; Samson, Wells, et al., 2015).

The adaptive value of specific strategies is often characterized based on their long-term effects—however, whether the appropriateness and efficacy of strategies may be the same across people with and without ASD is an open question. For instance, although avoidance is generally thought to be a maladaptive ER strategy, there is initial evidence to indicate it may not be maladaptive for children on the spectrum (Rieffe et al., 2014). ER strategies within the situation selection category (e.g., avoidance) are particularly effective for individuals who have difficulty using other types of strategies (Webb et al., 2018). Another example is restrictive and repetitive behaviors, particularly insistence on sameness. Although such behaviors are a diagnostic criterion for ASD, they are common in most typically developing young children to serve as strategies to manage fears and anxiety (Evans et al., 1997). Since adolescents and adults on the spectrum also seem to use repetitive behaviors to regulate their emotions (Samson, Wells, et al., 2015), we suggest that these strategies may be essential and potentially adaptive for people on the spectrum, especially if other, more cognitively taxing strategies are less accessible.

To summarize, there is increasing evidence that people on the spectrum use less sophisticated strategies and tend to use more behavioral approaches, including avoidance

or repetitive behaviors that are typically considered more maladaptive in the long run—however, more research is needed to determine to what extent individuals on the spectrum may benefit from such strategies in the short and long run. Differences in the ER repertoire might also be linked to fewer cognitive resources due to elevated reactivity in ASD.

Implementation Stage

The use of fewer adaptive ER strategies by people on the spectrum may also be due to problems with implementing strategies—however, given the paucity of research on ER tactics in both autism and other populations, it is not yet possible to determine whether people on the spectrum have difficulties with the implementation stage. We know that individuals use cognitive reappraisal less often spontaneously, but even after only a brief introduction with practice opportunities, they are able to significantly increase the use of cognitive reappraisal in the laboratory (Samson, Hardan, et al., 2015), suggesting that intervention programs targeting the selection and implementation of adaptive strategies may be beneficial for individuals on the spectrum.

Interestingly, some studies suggest that individuals on the spectrum may implement cognitive reappraisal differently (possibly using different tactics). Richey et al. (2015) investigated the neural correlates of instructed cognitive reappraisal. While no differences between ASD and typically developing groups were found in subjective ratings after implementing reappraisal, differences were identified in brain correlates during regulation, including a blunted dorsolateral prefrontal cortex activation in the ASD group. This suggests that individuals with ASD may achieve effective ER, despite using alternative functional brain mechanisms. Furthermore, Pitskel et al. (2014) demonstrated decreased functional connectivity between the prefrontal cortex and the amygdala, which corroborates with findings of reduced structural prefrontal–amygdala connectivity linked to difficulties with ER in individuals with ASD (Samson et al., 2016).

To summarize, it seems that individuals on the spectrum can implement more sophisticated strategies, such as instructed cognitive reappraisal in the lab, while using alternative functional brain mechanisms—however, since we have seen in the previous section that they use such cognitively taxing strategies less often spontaneously, it may be necessary to examine further how to support individuals with ASD to use cognitive reappraisal—for example, by means of other-focused ER or intervention programs.

Monitoring Stage

One needs to adequately monitor ER efficacy to maintain, change, or stop regulation efforts (Gross, 2015). We propose two mechanisms through which individuals with ASD may experience difficulties with monitoring: alexithymia and psychological inflexibility/rigidity. The monitoring stage requires people to determine the efficacy of their chosen ER strategies by gauging changes in their emotions. For people with ASD who have emotional awareness difficulties, it would be difficult to identify subtle changes in their emotions. In addition, researchers have speculated that psychological inflexibility, rigidity, and insistence on sameness may play a role in ER difficulties in autism (Cai et al., 2018; Costescu et al., 2016). We hypothesize that this may strongly impact the monitoring stage of ER—however, further research is needed to clarify the differential impact of alexithymia and psychological inflexibility/rigidity on emotion dysregulation in people on the spectrum.

Future Directions

The literature on the causes of ER difficulties in ASD is nascent; therefore, we turn to some open questions that remain to be fully resolved. First, although ER difficulties in ASD and associated adverse outcomes are well researched, our summary above demonstrates that more work is needed to pinpoint the stages of the ER process that may play a role in the ER difficulties observed in those on the spectrum. Although there is ample evidence for difficulties that people on the spectrum experience identifying their own emotions, which would impact the identification stage of the ER process, it is currently unclear where problems lie in the latter stages that cause these individuals to experience more emotion dysregulation. Therefore, it is crucial and timely to disentangle the ER difficulties that emerge from breakdowns in early versus late stages of the ER cycle in ASD, and identify mechanisms that impact one or more stages of the ER process, as well as understand how difficulties in the early stages affect the later stages. More sophisticated paradigms may be required to achieve this goal. Gaining these insights may help to optimize individualized interventions for people with ASD (i.e., targeting a specific stage of the ER process).

Second, as mentioned earlier in this chapter, specific strategies traditionally seen as maladaptive may be useful for individuals on the spectrum, particularly in the context of lower accessibility to other strategies. Future studies may want to examine in more detail to what extent and under which circumstances strategies such as avoidance and certain motor stereotypies (pacing, stimming, body rocking, etc.), as well as insistence on sameness (such as keeping a routine), may be beneficial for individuals with ASD.

Third, coregulation of emotions becomes key in the context of potentially limited self-regulation skills, low adaptive functioning, and often dependence on lifelong assistance (Nozaki & Mikolajzak, 2020)—however, current literature offers limited insight into the extent to which individuals with ASD can benefit from other-focused ER—an external regulator's attempt to modulate emotions in the person with ASD. Surprisingly, only a few studies have explicitly examined social support seeking, caregiver coregulation of emotions, and the efficacy of other-focused ER in individuals with ASD. While children with ASD seem to be able to benefit from their mother's coregulation (Hirschler-Guttenberg et al., 2015), they seem to use social support less frequently (Samson, Wells, et al., 2015). This suggests a potential discrepancy between being able to benefit from versus actively seeking other people's support, which might be linked to lower social motivation in many people with ASD (Chevallier et al., 2012). Difficulties in social communication and interaction may also impair efficacious requests for coregulation.

Finally, given that individuals with ASD have difficulties reading social cues, we hypothesize that other-focused ER may be overlooked or not be as effective or beneficial when the individual with ASD is paying less attention to subtle cues (conveyed by changes in tone of voice or facial expressions) or is not adequately interpreting the regulator's attempts. For example, in close relationships and other social contexts, interpersonal touch plays an important role in ER (Debrot et al., 2013)—however, we hypothesize that sensory sensitivities in ASD may render it difficult to benefit from touch as a coregulation strategy. Future contributions should, therefore, not only attempt to conceptualize other-focused ER in ASD within the framework of the extended model of ER (see Nozaki & Mikolajzak, 2020) but also to further determine to which extent individuals with ASD are able to benefit from different types of other-focused ER strategies, as well as to disentangle in which stages of the other-focused ER process difficulties may emerge. Such studies may provide important insights into the design of efficacious intervention programs that target ER difficulties.

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CHAPTER 46

Emotion Regulation in Schizophrenia and Related Disorders

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Schizophrenia has long been considered principally a disorder of cognition, as evident by the cognitive difficulties underlying the positive symptoms of schizophrenia (e.g., delusions, hallucinations, disorganized thoughts and speech), as well as the high prevalence of neurocognitive deficits—however, there is a growing appreciation of the role of affective disturbances in both positive and particularly negative symptoms. Negative symptoms refer to an absence or lack of normal mental functioning and include anhedonia (decreased experience of pleasurable emotions) and avolition (diminished motivation), as well as flat affect (lack of outward expression of emotions). While lesser known than positive symptoms, which are the hallmark of the disorder and tend to ebb and flow over the course of illness, negative symptoms are far more stable and enduring, are typically resistant to pharmacological and psychotherapeutic interventions, and tend to have a substantial detrimental impact on clinical outcomes and functioning. Thus, while historically schizophrenia has not been viewed as an “affective” disorder, emotion regulation difficulties have been linked with both positive and negative symptoms, and are a core feature of the disorder (Aleman & Kahn, 2005).

Advances in affective science over the past two decades have dramatically expanded our understanding of emotion regulation: the processes by which individuals modify their emotional responses, including their intensity, when they occur, how long they last, and how they are expressed. Relatedly, within the context of schizophrenia research, a burgeoning empirical literature over the past decade has focused on the critical role emotion regulation plays in clinical outcomes and functioning. In this chapter, we summarize key work from the literature on emotion regulation in schizophrenia spectrum disorders, with a particular focus on Gross's (1998, 2015) extended process model of emotion regulation.

Specifically, we review the empirical research in schizophrenia comparing use of emotion regulation strategies in people with schizophrenia versus other clinical and

healthy populations, the clinical and functional correlates of emotion regulation strategies, as well as the link between emotion regulation and risk for psychosis onset. Finally, we close by proposing future directions for research.

Emotion Regulation in People with Schizophrenia

Gross's (1998, 2015) extended process model of emotion regulation contrasts two key emotion regulation strategies: cognitive reappraisal, an antecedent-focused strategy involving the reinterpretation of a stimulus to control an emotional response, versus expressive suppression, a response-focused strategy involving the intentional dampening of outward emotional expressivity. Earlier studies employing self-report measures (e.g., Emotion Regulation Questionnaire; Gross & John, 2003) have pointed to substantial emotion regulation disturbances in people with schizophrenia. Specifically, cross-sectional comparisons to healthy controls have indicated that individuals with schizophrenia use significantly more expressive suppression and significantly less cognitive reappraisal (Horan et al., 2013; Kimhy, Vakhrusheva, et al., 2012; van der Meer et al., 2009; Ludwig et al., 2020), though these findings are not universal (Badcock et al., 2011; Perry et al., 2011), potentially due to sample characteristics (e.g., higher proportion of participants with schizoaffective disorder), as well as the impact of antipsychotics, symptom profiles, and phase of illness (Kimhy, Myin-Germeys, et al., 2012). Overall, a recent meta-analysis by Ludwig et al. (2019) employing data from 42 studies with 2,498 individuals with psychosis spectrum disorders and 3,381 healthy controls confirmed a significantly higher use of suppression and significantly lower use of cognitive reappraisal among individuals with psychosis spectrum disorders. Comparisons to other clinical populations with serious mental illness suggest comparable difficulties in emotion regulation; a recent study (Zhang et al., 2020) reported no significant differences in the use of suppression and reappraisal between individuals with schizophrenia and bipolar disorder.

While these findings appear robust, the high prevalence of episodic memory deficits in schizophrenia have raised concerns about the employment of retrospective measures in this population (Blum et al., 2015). To address these concerns, researchers have utilized experience sampling method, an intensive longitudinal assessment methodology employing smartphones to probe experiences during "real-world" daily functioning (Kimhy et al., 2006; Kimhy, Myin-Germeys, et al., 2012). In a series of studies, Strauss and colleagues (Bartolomeo et al., 2022; Raugh & Strauss, 2022; Visser et al., 2018) found that people with schizophrenia demonstrate comparable emotion regulation effort, but poor effectiveness compared to healthy controls, with abnormalities observed at each of the three stages of the emotion regulation process: identification (i.e., after an emotion is detected, determining whether to regulate or not), selection (i.e., choosing a contextually appropriate emotion regulation strategy), and implementation (i.e., executing the strategy that has been selected).

At the identification stage, individuals with schizophrenia initiated emotion regulation efforts at a lower threshold of negative emotion intensity. At the selection stage, they selected more strategies than healthy controls and the strategies attempted were less contextually appropriate. Finally, at the implementation stage, their use of moderate to high levels of effort were ineffective at decreasing negative emotion (Visser et al., 2018). A follow-up study indicated that individuals with schizophrenia identified the need to regulate emotions at a higher rate than controls, with the former displaying an inefficient threshold for identifying the need to regulate (i.e., regulating too much when negative

affect was low and too little when negative affect was high). Likewise, emotion regulation effort exertion was also inefficient, such that effort was too high at low levels of negative affect and too low at high levels of negative affect (Raugh & Strauss, 2022). Finally, Bartolomeo and colleagues (2022) reported that individuals with schizophrenia exhibited abnormal monitoring dynamics (i.e., maintenance, switching, and stopping of emotion regulation) characterized by excessive switching between emotion regulation strategies (i.e., switching to a different emotion regulation strategy because of ineffectiveness of original one) and delayed stopping (i.e., terminating implementation of emotion regulation strategies), compared to healthy controls.

These findings are in contrast to a handful of experimental studies that have examined emotion regulation in individuals with schizophrenia spectrum disorders in the lab. Grezelschak et al. (2015) found that in lab settings, individuals with psychosis are likelier to select less adaptive ways of regulating their emotions compared to healthy controls, but they do not differ in their use of adaptive strategies to reduce negative emotions once instructed to do so. A follow-up study with a sample of patients with acute delusions reported similar results (Opoka et al., 2021), suggesting that, under optimal conditions, emotion regulation may be enhanced in people with schizophrenia.

Related to these findings, another key variable that has attracted much interest for its relevance in emotion regulation is emotion awareness—studies by our group and others have established that individuals with schizophrenia have difficulties differentiating emotions (Kimhy et al., 2014; Vakhrusheva et al., 2020) and display significantly poorer emotion awareness characterized by difficulties identifying and describing feelings compared to non-ill siblings and healthy controls (Kimhy, Vakhrusheva, et al., 2012; van't Wout et al., 2007). A review and meta-analysis of eight studies by O'Driscoll et al. (2014) confirmed these findings, indicating a moderate to large effect associated with schizophrenia.

Altogether these findings point to substantial abnormalities in the identification, selection, and implementation stages of Gross's (1998, 2015) extended process model of emotion regulation among individuals with schizophrenia, though some emotion regulation may be retained and can be implemented more effectively when instructed to do so under ideal conditions. Specifically, identification stage abnormalities may be particularly critical in creating “a bottleneck that feeds forward and impacts subsequent stages of emotion regulation in schizophrenia” (Raugh & Strauss, 2022, p. 1062).

Clinical and Functional Correlates of Emotion Regulation in Schizophrenia

Emotion regulation difficulties among individuals with schizophrenia spectrum disorders have been associated with a wide array of clinical and functional outcomes. An early study by Badcock et al. (2011) identified a link between use of suppression and increase in severity of auditory hallucinations, as well as greater disruption in daily life. Additionally, use of rumination was significantly correlated with the distress, but not with the severity of auditory hallucinations. Studies employing the experience sampling method provided additional support for this link—patients with psychosis with higher instability of negative emotions showed more severe levels of paranoia, with use of suppression significantly predicting higher-state paranoia (Nittel et al., 2018). Similarly, a study by our group (Kimhy et al., 2020) found that the use of suppression predicted significant increases in momentary experiences of thought insertion, mind reading, auditory and

visual hallucinations, and that cognitive reappraisal predicted significant increases in momentary experiences of suspiciousness, thought insertion, and mind reading.

In contrast, there were no associations between retrospective measures of emotion regulation and symptoms. The latter are somewhat surprising, given previous reports linking reappraisal with more effective functioning—however, consistent with previous reports (Visser et al., 2018; Raugh & Strauss, 2022), these results suggest that individuals with schizophrenia may attempt to employ reappraisal, but such efforts often may not be effective. The contradictory findings between in-the-moment and retrospective reports of emotion regulation may also be attributed to both emotion regulation efforts and psychotic symptoms displaying substantial variability over short periods of time, making it challenging for retrospective assessments to capture their ebb and flow. Additional support for this link is provided by an experience sampling method study in which Bartolomeo and collaborators (2022) found associations between emotion regulation and negative symptoms. Specifically, avolition was significantly associated with duration of emotion regulation (e.g., stopping effort to regulate emotions), and avolition and anhedonia were significantly correlated with frequency of changing emotion regulation strategies (e.g., switching). Overall, a recent review of 22 studies indicated that maladaptive emotion regulation strategies, including suppression, as well as rumination and worry, were associated with psychotic symptoms (Liu et al., 2020).

Another domain that has attracted substantial research interest is the impact of emotion regulation strategies on daily functioning. Poor daily function and disability are highly prevalent among individuals with schizophrenia, with psychosocial functioning domains particularly affected. Specifically, results by our group (Kimhy, Vakhrusheva, et al., 2012) and others demonstrate that greater use of reappraisal and diminished use of suppression predicts better social functioning in this population (Badcock et al., 2011; Moran et al., 2018; Perry et al., 2011), with this relationship extending to individuals who are at clinical high risk for psychosis (Kimhy et al., 2016), although these findings are not universal (Henry et al., 2008; Raugh & Strauss, 2022).

Relatedly, among individuals with schizophrenia, better social functioning was associated with the ability to identify, and particularly to describe, emotions and better emotion management, as well as greater use of reappraisal and less use of suppression. A hierarchical multiple regression analysis indicated that, after controlling for age and neurocognition, difficulties describing feelings accounted for 35.0% of the social functioning variance (Kimhy, Vakhrusheva, et al., 2012), as well as moderated the impact of emotion regulation on psychotic symptoms during the course of daily functioning. Furthermore, these emotion awareness deficits have been documented to be present in comparable severity among individuals at clinical high risk for psychosis. Difficulties describing feelings accounted for 23.2% of the social functioning variance in this population (Kimhy et al., 2016; Van der Velde et al., 2015) and demonstrated differential associations with positive and negative symptoms (Raugh & Strauss, 2022). Finally, examination of emotion awareness in individuals with schizophrenia and bipolar disorder indicated comparable severity, with poor emotion awareness in individuals with bipolar disorder predicting social functioning, echoing the findings in schizophrenia (Ospina et al., 2019).

Emotion Regulation and Risk for Psychosis

The high prevalence of poor emotion regulation among individuals with schizophrenia has raised questions about their developmental origin and timeline—specifically, whether

the emotion regulation difficulties observed in people with schizophrenia are associated with the disorder or are present prior to the onset of psychosis and thus may potentially contribute to its development. One study by our group (Kimhy et al., 2016) investigating this question has examined emotion regulation among individuals at clinical high risk for psychosis: adolescents and young adults who experienced attenuated symptoms of psychosis but did not experience a full psychotic episode. A cross-sectional study comparing 54 at-risk individuals, 87 individuals with schizophrenia, and 50 healthy controls indicated significant differences between the two clinical groups and the healthy controls in their use of emotion regulation strategies. Specifically, the at-risk and schizophrenia groups displayed comparable use of suppression and reappraisal, with significantly lower mean reappraisal scores and significantly higher mean suppression scores compared to controls. These findings are consistent with Van der Velde et al. (2015), suggesting that the emotion regulation difficulties observed in individuals with schizophrenia are present in comparable severity prior to the onset of psychosis and thus are not an outcome of the onset of psychotic symptoms.

These findings are also consistent with studies examining emotion reactivity in individuals at clinical high risk for psychosis. In a series of three studies, Chapman et al. (2020) examined emotion regulation across phases of psychosis, including (1) adolescents with and without psychotic-like experiences, (2) adolescents at clinical high risk for psychosis and healthy controls, and (3) individuals with schizophrenia spectrum disorders and healthy controls. The three psychosis groups did not differ from one another in their use of suppression, but displayed a vulnerability-related, dose-dependent decrease in reappraisal, with lower use being associated with poorer clinical outcomes. Similarly, Vines et al. (2022) examined emotion regulation longitudinally in individuals at clinical high risk for psychosis, adolescents diagnosed with a psychotic disorder, and typically developing adolescents. The two clinical groups reported significantly greater difficulty utilizing emotion regulation strategies compared to controls. Longitudinally, emotion regulation impairments remained consistent and stable across age in all groups, with no interactions between group and age or group and visit on any affective measure. Notably, greater emotion regulation impairments were associated with increased emotion reactivity. Specifically, lower use of reappraisal was associated with lower social functioning and higher negative symptom severity. Altogether, these findings add to the growing literature indicating that emotion regulation abnormalities are present in individuals at clinical high risk for psychosis prior to the onset of psychosis.

Summary and Future Directions

A growing empirical literature has demonstrated that emotion regulation disturbances are highly prevalent among individuals with schizophrenia spectrum disorders. Such disturbances are present prior to the onset of psychosis and play a key role in influencing clinical and functional outcomes, particularly social functioning. As abnormalities in emotion regulation have been identified as transdiagnostic risk factors of internalizing and externalizing disorders, future studies should aim to examine the potential role of emotion regulation, its relevance to the stress–vulnerability model, and as a risk factor for later development of a psychotic disorder. A second direction of future research should aim to further delineate the impact of poor emotion awareness on emotion regulation in individuals with schizophrenia spectrum disorders. Finally, researchers should aim to translate the findings of emotion regulation disturbances in schizophrenia into clinical interventions.

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CHAPTER 47

Emotion Regulation in Personality Disorders

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Although emotion regulation (ER) problems have been studied in the context of many psychological disorders, the personality disorders field—and most notably the study of borderline personality disorder (BPD)—is especially known for such a focus (Linehan, 1993). Given the extensive research on ER and BPD (and the dearth of ER research in other personality disorders), we focus specifically on this area of work. In basic emotion science, ER is defined as the automatic or volitional attempt to influence the experience and/or expression of emotion (e.g., Gross, 1998; Gross & Jazaieri, 2014)—however, ER research within the BPD field is characterized by a variable conceptualization and application of the ER construct.

Many theories suggest that BPD involves alterations in emotional experiences and ER (Linehan, 1993; Sauer-Zavala & Barlow, 2014). Linehan's Biosocial Model popularized the term *emotion dysregulation* in asserting that it is the core of BPD and directly or indirectly accounts for all BPD symptoms. In this model, Linehan defined emotion dysregulation not as the inverse of ER per se but rather as a broader term that captured problems with emotion processes (i.e., emotional vulnerability, including sensitivity, reactivity, and delayed return to baseline) *and* their regulation. Although Linehan's model was instrumental in placing “emotion dysregulation” firmly within the psychological lexicon and advancing the study of ER processes in psychopathology, it also contributed to variable use of the ER term in psychopathological research. This is because some theorists and researchers now use the term *emotion dysregulation* to refer to both emotion and ER processes (e.g., Kuo et al., 2016), whereas others may use the term to refer specifically to the inverse of, or problems with, ER (e.g., Gross & Jazaieri, 2014).

Adding to the myriad ways of operationalizing ER, many researchers have focused on ER from a dispositional standpoint. For example, the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a self-report measure that is particularly

widely used in the personality disorders field. This questionnaire assesses emotional non-acceptance, difficulties in impulse control and engaging in goal-directed behavior when distressed, lack of emotional awareness and clarity, and limited access to effective ER strategies. Although clearly related to Gross's (2015) definition of ER, these subscales may or may not directly reflect problems in selecting, implementing, or experiencing benefit from ER per se but rather refer to a dispositional tendency toward ER and related processes, such as being aware of, or able to, identify emotions. Ultimately, identifying how ER operates in personality disorders is a complex endeavor as studies vary widely in the meaning and use of terminology (e.g., emotion dysregulation, ER problems), and the extent to which the measures used assess the intended constructs. Below, we review research on ER processes in BPD, adopting the basic emotion science understanding of ER (e.g., Gross, 1998, rather than Linehan's 1993 broader emotion dysregulation construct, which also encapsulates emotion dynamics).

ER Strategy Use in BPD

Given that BPD is frequently conceptualized as involving fundamental ER problems (e.g., Linehan, 1993) and that impulsive behaviors that characterize BPD (e.g., self-injury) can serve ER functions (albeit in destructive ways), studies have examined the extent to which people with BPD utilize ER strategies that are typically viewed as "maladaptive" (i.e., destructive strategies, such as self-injury, binge eating, and rumination) versus "adaptive" (e.g., strategies such as cognitive reappraisal, which involves rethinking emotional situations to change their impact; Gross & John, 2003). Findings indicate that a BPD diagnosis and higher BPD symptoms are associated with greater use of maladaptive strategies compared to healthy, low BPD features, and other clinical groups in daily diary and experimental paradigms (e.g., Daros & Williams, 2019; Fitzpatrick et al., 2018; Southward et al., 2019).

Findings are more mixed with respect to the use or lack thereof of "adaptive" ER strategies, with some studies suggesting that BPD or high BPD features are associated with higher use of adaptive strategies (e.g., Daros et al., 2018; Fitzpatrick et al., 2018), and others suggesting the opposite (e.g., Southward et al., 2019). Therefore, it is possible that BPD is not only characterized by using destructive behavior to regulate emotions but a higher general effort to regulate emotions, including the use of adaptive strategies, perhaps because their more intense emotions require greater regulatory effort (e.g., Austin et al., 2007; Kuo et al., 2016)—however, more research is needed to identify the specific conditions under which individuals with BPD use more or fewer ER strategies.

ER Strategy-Instructed Implementation in BPD

In addition to *what* ER strategies people with BPD are using, many researchers have aimed to understand more about *how* they use them. Those with BPD subjectively report experiencing ER strategies to be less effective than others (Daros et al., 2018; Kuo et al., 2016), and ratings of how they would use ER strategies in hypothetical situations suggest that they implement them with poorer quality than clinical and healthy controls (Southward et al., 2019)—however, studies that involve instructing individuals to use specific ER strategies in daily life and experiments while measuring the extent to which they can alter neural, self-reported, and psychophysiological indices of emotion, paint a

different picture. Interestingly, most of these studies suggest that individuals with BPD do *not* exhibit deficits in the implementation of ER strategies, as they can decrease self-reported, sympathetic, and parasympathetic markers of emotion to the same extent as control groups when instructed to use cognitive reappraisal (Baczkowski et al., 2017; Ruocco et al., 2010; Schulze et al., 2011), suppress emotional expressions (Evans et al., 2013), and practice mindfulness/acceptance (Dixon-Gordon et al., 2017; Evans et al., 2013; Fitzpatrick et al., 2022). In fact, some research suggests that BPD and higher BPD features are associated with *more* positive emotions when using avoidance (Turner et al., 2017). Conversely, some findings suggest that those with BPD exhibit less improvement in self-reported emotions using distraction compared to control groups, but comparable improvements on parasympathetic and sympathetic indices (Fitzpatrick et al., 2022; Kuo et al., 2016). Furthermore, use of acceptance-based strategies (Dixon-Gordon et al., 2017), including labeling emotions (Fitzpatrick et al., 2019), is associated with greater increases in parasympathetic activity in BPD (relative to healthy controls), perhaps reflecting greater recruitment of effortful ER.

Ultimately, these findings generally suggest that those with BPD do not exhibit deficits in the instructed *implementation* of ER strategies and may experience some short-term benefits in ER strategies that involve disengaging from emotion, although their long-term benefits could be negative—however, it is important to note that individuals with BPD exhibit elevated emotional intensity at baseline compared to control groups (Fitzpatrick et al., 2022; Kuo et al., 2016). Although most aforementioned research suggests that those with BPD or high BPD features are comparable to others in the extent to which they can *reduce* emotion, few suggest that they are *better* at it than other groups. Thus, those with BPD may continue to experience elevated emotion after “successful” ER implementation because they “started off” with higher emotion at baseline and thus, ended with higher levels of intensity as well (Kuo et al., 2016).

Indeed, people with BPD seem to exhibit relatively higher emotional intensity than comparison groups in neuroimaging studies, and recruit unique neural regions to implement ER. Findings suggest that those with BPD exhibit hyperactivation (or less reduction) in emotional neural regions, such as the amygdala and insula, compared to controls during or after instructed ER (Schulze et al., 2011). Moreover, BPD involves less activation of ER regions (e.g., dorsal anterior cingulate cortex, dorsolateral prefrontal cortex; van Zutphen et al., 2018) or different activation (i.e., greater relative activation of right vs. left lateral prefrontal cortex in BPD than healthy participants; Ruocco et al., 2010) when using cognitive reappraisal compared to controls. Further, another study revealed less functional connectivity between emotional (i.e., amygdala) and ER brain regions (i.e., prefrontal cortex, superior temporal gyrus, posterior cingulate cortex) compared to healthy controls (Baczkowski et al., 2017). Therefore, although individuals with BPD may be able to reduce emotions comparably to others using ER strategies, they may utilize unique neural processes to do so or experience differential activation in the neural regions that facilitate ER. Further, given their elevated emotional intensity at baseline, they may require additional emotion regulatory effort to achieve levels of emotional intensity that are comparable to groups without BPD.

ER Appropriateness and Flexibility in BPD

Whereas those with BPD have the capacity to implement ER to reduce emotion to the same extent as others, they may encounter difficulties in selecting ER strategies that are well suited to the particular contexts they find themselves in, or the specific emotions

they are experiencing. In a series of studies among online-recruited samples with a range of BPD features and community-recruited participants with BPD diagnoses, BPD features were associated with a greater preference for feeling anger, and a BPD diagnosis was associated with less preference for feeling happiness, when individuals were aiming to collaborate with others. Conversely, when individuals were aiming to have a confrontation with others, BPD features were associated with a greater preference for feeling happiness (López-Pérez & McCagh, 2020). These findings indicate that BPD is associated with a preference for emotions that are not well suited to aims in a given situation.

In addition to poorly matched emotional preferences with contexts, BPD is also associated with a lack of flexibility in how to use ER. In response to a series of stressful vignettes, participants were asked what ER strategies they would use first and then again if their initial strategies were unsuccessful (Southward et al., 2018). The authors found that BPD features were associated with fewer strategies used, more typically maladaptive strategies, and less willingness to switch strategies if their initial ER attempts were successful. Experimental paradigms also suggest that BPD features are associated with a greater preference to use avoidance-based strategies (i.e., distraction) over other strategies (i.e., reappraisal), particularly in response to more intense emotional experiences or cues (Kuo et al., 2018; Sauer et al., 2016). Taken together, individuals with BPD and elevated BPD features may prefer emotions that are misfit for their goals, and tend to have constrained selections of ER strategies, perhaps due to their preference for avoidance-related strategies.

Interpersonal ER in BPD

With joint interpersonal and emotional impairments evident in BPD, researchers have called for work delineating the nature of interpersonal versus intrapersonal ER deficits in the disorder (Fitzpatrick et al., 2021; Gratz et al., 2016). Interpersonal ER refers to interpersonal interactions that modulate emotion (Zaki & Williams, 2013; see also Niven, this volume) across efforts to regulate *one's own* emotions (*intrinsic* interpersonal ER) or *another person's* emotions (*extrinsic* interpersonal ER). In one study, participants were asked to identify people in their social network and rate the likelihood and effectiveness of using those people to regulate their emotions (Howard & Cheavens, 2023). Elevated BPD features were associated with decreased reported ER efficacy of intrinsic interpersonal ER, and less willingness on their partners' parts to contribute to such ER efforts. Furthermore, among those higher in BPD features, higher relationship closeness and quality was associated with less effort to receive interpersonal ER. Conversely, higher BPD features were associated with elevated maladaptive intrinsic interpersonal ER strategies, such as venting and excessive reassurance seeking (Dixon-Gordon et al., 2018). In a rigorous observational study, women with BPD engaged in more support seeking (especially in maladaptive support-seeking behaviors) and engaged in less closeness-generating behaviors while discussing threatening topics with their partners than healthy women (Miano et al., 2021). In one of the few studies of extrinsic interpersonal ER in BPD, findings showed that individuals with BPD reported less use of strategies to improve others' emotional states than healthy controls (López-Pérez et al., 2017). Thus, there is some modest evidence that BPD is associated with less adaptive extrinsic interpersonal ER and more maladaptive intrinsic interpersonal ER than their healthy counterparts. The extent to which this pattern of results reflects alterations in emotional functioning, available social supports, or social cognition, remains unclear, and additional investigation into extrinsic ER in particular is needed.

Remaining Questions

Despite the central hypothesized role of ER in personality disorders (e.g., Gross & Jazaiyeri, 2014; Linehan, 1993), evidence remains both mixed and inconclusive. Studies suggest that BPD is associated with a greater use of generally maladaptive strategies to regulate emotions, avoidance-related ER strategies, inappropriate matches between ER strategies and contexts, less flexibility in which ER strategies are used, and less effective interpersonal ER—however, individuals with BPD can implement instructed ER strategies to the same extent as control groups and may also use more adaptive ER strategies. Given that they have higher baseline emotional intensity than other groups, the challenge of people with BPD may not lie in effectively implementing ER but learning to do so even better than others can—however, more precise paradigms are needed to pinpoint ER deficits in BPD, with a focus on disentangling goals, strategy selection, and effective implementation. With respect to other personality disorders, research on ER is scant. The minimal research in this area suggests that those with other personality disorders (e.g., antisocial personality disorder, obsessive-compulsive personality disorder) may exhibit general ER deficits on trait measures, such as the DERS, but such associations either disappear when BPD symptoms are controlled for, or are lower than ER deficits in BPD samples (e.g., McGonigal & Dixon-Gordon, 2019; Steenkamp et al., 2015). Clearly, much more research is needed to specify whether and how ER problems are apparent in those with personality disorders other than BPD. Moreover, there is a need to fine-tune our assessment ER to better understand ER as a potential target in treatments for personality disorders (Gratz et al., 2016; Southward et al., 2021). The field of ER in personality disorders is therefore “wide open,” with many key questions remaining to be answered.

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SECTION X

INTERVENTIONS

Clinical Settings

CHAPTER 48

Emotion Regulation Therapy

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Distress represents a complicated and prolonged stress response characterized by internal suffering (e.g., Shackman et al., 2016), including intensely aversive and prolonged emotional states, as well as self-focused processing of negative emotions and stressors (e.g., Mennin & Fresco, 2013). The phenomenological experience of distress is increasingly regarded as a transdiagnostic characteristic. At a diagnostic level, the “distress/misery disorders” comprise generalized anxiety disorder, major depressive disorder, persistent depressive disorder, and posttraumatic stress disorder (e.g., Waszczuk et al., 2017). These disorders pose a significant public health burden, are among the most commonly occurring and impairing psychiatric disorders (Kessler et al., 2005), and are not likely to spontaneously remit without intervention. Distress disorders can complicate the presentation and treatment of medical conditions throughout the lifespan, contributing to an increased risk of cardiovascular disease (e.g., Cohen et al., 2015). Further, emotionality and perseverative negative thinking can increase unhealthy habits and somatic disease (e.g., Clancy et al., 2016; McEwen, 1998).

The efficacy of cognitive-behavioral therapies is well established. Meta-analyses consistently show that these treatments reduce symptoms of distress disorders when compared to control conditions with medium to large effect sizes (e.g., Cuijpers et al., 2016). Yet, meta-analytic findings also reveal uneven outcomes and responsibility to treatment for individuals with distress disorders (e.g., Cuijpers et al., 2016). High levels of distress (i.e., negative emotionality; Olatunji et al., 2010) or perseverative negative thinking (e.g., Mennin & Fresco, 2013) contributes to an inferior treatment response and more fragile recovery following efficacious treatments. Accordingly, we developed emotion regulation therapy (ERT) to directly target these treatment-refractory elements of distress (i.e., emotionality, perseverative negative thinking) using a theoretically derived, mechanism-focused framework. Specifically, ERT integrates affect science with cognitive-behavioral principles and mindfulness meditation to target and normalize neurobehavioral deficits

underlying distress (Mennin & Fresco, 2015). Below, we outline the affect science framework for ERT, the components of the approach, its current evidence base, and directions for further investigation.

Applying an Affective Science Approach to the Nature and Treatment of Distress

The field of affective science seeks to elucidate adaptive and maladaptive emotional responses to stressors (e.g., Davidson et al., 2009) while providing an empirical basis for how to target distress. Normative emotional processing and regulation models (Gross, 2015a) offer a framework to elucidate biobehavioral markers that are reliably dissociable in patient subgroups as compared to healthy controls (Craske, 2012). In turn, these markers can serve as a guide to hone interventions to better target central determinants of distress and dysfunction (Gordon, 2017). Using an affective science framework of emotion processing and regulation, we have delineated a model predicated on Gross (2015b) that targets motivational, regulatory, and resultant behavioral components of adaptive and maladaptive stress responding (Mennin & Fresco, 2015).

Specifically, we have argued that distress-related conditions can best be understood by a failure in temporally sequenced mechanisms that comprise the normative emotional response cascade (e.g., Craske, 2012). Deficits can first be seen in (1) *motivational mechanisms (the initial response)*, reflecting the functional and directional properties of an emotional response tendency. For instance, distress disorders are characterized by subjective emotional intensity/distress (e.g., Mennin & Fresco, 2015) that likely derives from greater temperamental negative affect (e.g., Shackman et al., 2016) and concurrent activation of motivational systems that mobilize the pursuit of safety/reducing perceived threat, reward/minimizing loss (e.g., Klenk et al., 2011), or both. Given these deficits, individuals with distress disorders respond poorly to this motivational conflict, which in turn can be exacerbated by suboptimal (2) *regulatory mechanisms (secondary responses)*, encompassing (2a) attentional (e.g., broadening, shifting, and sustaining attention to interoceptive and exteroceptive emotional stimuli; e.g., Botvinick et al., 2001) and more elaborative (2b) metacognitive strategies, including decentering (i.e., the ability to observe items that arise in the mind with healthy psychological distance, greater self-awareness and perspective taking; Bernstein et al., 2015) and cognitive reappraisal (i.e., the ability to change one's evaluation of an event so as to alter its emotional significance; Buhle et al., 2014). Instead, individuals in distress often resort to perseverative strategies (e.g., worry, rumination, self-criticism) as a way of managing distressing emotions and motivations. These regulatory failures result in deficits in emotional clarity and in turn, *behavioral consequences* that include short-term maladaptive behavioral outcomes (e.g., alcohol and drug use, maladaptive eating, physical withdrawal) and long-term impact on threat and reward learning (i.e., lack of approach behavior in favor of greater perceived safety, withdrawing pursuit of potentially rewarding outcomes; Mennin & Fresco, 2015).

Emotion Regulation Therapy

ERT is a brief psychotherapy focially developed to help ameliorate the impact of distress. ERT combines principles from traditional and contemporary cognitive-behavioral therapies with the aforementioned dysregulation model to target the motivational and

regulatory mechanisms that result in maladaptive behavioral responses and longer-term negative contextual learning consequences (see Fresco & Mennin, 2019; Mennin et al., 2013; Mennin & Fresco, 2015, for discussions). ERT is divided into two different phases. The first phase seeks to increase awareness of moments when strong emotional reactions occur and the way they cascade and lead to action or inaction. This goal is accomplished through the psychoeducation of antecedents and consequences of negative self-referentiality, including earlier motivational responses and later contextual/behavioral learning consequences. In addition, self-monitoring and cue detection of online momentary emotional reactions aid in gaining subsequent clarity and agency in taking contextually adaptive actions that are most adaptive for each context. Therapists explore the present moment in session through imagery tasks, which involve a vivid reimagining of an activating event from the past week and their emotional responding to the event. Following the promotion of clients' understanding of their emotional responses conceptually and experientially in the moment, focus moves toward learning to identify alternative or "counteractive" behavioral responses that they imagined or engaged that would be more functional for successfully handling the situation or state of mind at hand.

As the first phase advances, clients learn a progression of mindful emotion regulation skills that can be deployed in the moment to enhance emotional clarity and take effective action. Drawing from Gross's (2015b) emotion regulation model and the extant clinical and experimental literature, ERT targets different regulatory capacities by utilizing a sequence of intervention processes that vary in their entry points along the trajectory of unfolding emotional experience. Specifically, skills are presented in a specific order beginning with less cognitively elaborative skills (i.e., attention regulation skills of broadening and sustaining attention) followed by more cognitively elaborative skills (i.e., metacognitive regulation skills of decentering and reappraisal). Formal mindfulness meditation practice and momentary implementation are used to build emotion regulation skills. Practices have been honed to target specific mechanisms of attention and metacognition. In the final session of the first phase, clients are presented with a complete "toolkit," which outlines the four main regulatory skills and associated practices.

Whereas the first half of ERT helps individuals move from "being reactive" to "being counteractive" in response to emotional states, the second phase introduces "being proactive" in service of broadening one's behavioral repertoires. Phase II utilizes mindful emotion regulation skills to facilitate taking proactions that reflect a meaningful and rewarding life path. Identifying meaningful proactions is accomplished by working to delineate meaningful and personally relevant goals, which involve intentionality and "top-down" processing of personal meaning and values-congruent goal setting while also attending to "bottom-up" influences of safety and reward motivational impetuses. This preparation for taking proactive steps begins with setting a personally relevant goal despite the presence of strong safety motivations and low reward motivation, or feeling highly distressed from simultaneously strong safety and reward motivations, or even high reward motivation without contextually appropriate safety motivation. Proactions are engaged through exposure interventions, including planned between-session exercises; imaginal action related to values-informed goals; and experiential dialogue tasks to explore, clarify, and resolve internal motivational conflicts that may prevent action.

At the conclusion of Phase II, sessions focus on consolidating gains and preparing for termination in hopes of adopting an "agentic stance" to cultivate self-reliance to better manage life's challenges. Initial goals are reviewed to determine successes and what still needs to be addressed. Discussion focuses on ways to maintain this self-reliance and continue to work toward not trying to solely obtain a sense of safety or withdraw due to

low reward or loss, or subsequently respond reactively (e.g., excessive worry, rumination, and behavioral avoidance) once therapy is terminated. See Figure 48.1 for a summary of this emotion regulation model and how ERT targets each of these model components.

Treatment Outcome and Mechanism Findings

ERT has established considerable efficacy in seven trials (five published and two currently under review spanning psychiatric patients with distress disorders, as well as individuals in other distressing contexts, including serving as informal cancer caregivers and among individuals negatively impacted by the COVID-19 pandemic (Applebaum et al., 2020; Mennin et al., 2018; O'Toole, Mennin, et al., 2019; Renna et al., 2018; Spaeth et al., 2022). For instance, in a randomized controlled trial, distressed psychiatric patients as compared to a wait-list comparator, evidenced significantly greater reductions in anxiety and depression symptoms, and corresponding improvements in functional impairment and quality of life, with between-subject effect sizes in the medium to large range (Hedges's $g = 0.5\text{--}2.0$) with gains maintained 9 months following treatment (Mennin et al., 2018). More recently, 72 patients endorsing elevated worry and/or rumination and meeting diagnostic criteria for a distress disorder were randomized to 8- or 16-session versions of ERT. Whereas both formats produced significant improvements through a 2-year follow-up, the 16-session version showed an advantage over the eight-session version for distress disorder severity, worry, rumination, and attention shifting across the acute period, with these improvements sustained across the follow-up periods (Renna et al., 2022).

Similarly, distressed informal caregivers of cancer patients were randomly assigned to ERT versus a wait-list control. Findings indicated strong between-subject reductions favoring ERT in psychological distress, worry, and cancer-related burden ($g = 0.5\text{--}1.0$), which were maintained through a 6-month follow-up. Notably, ERT-linked treatment

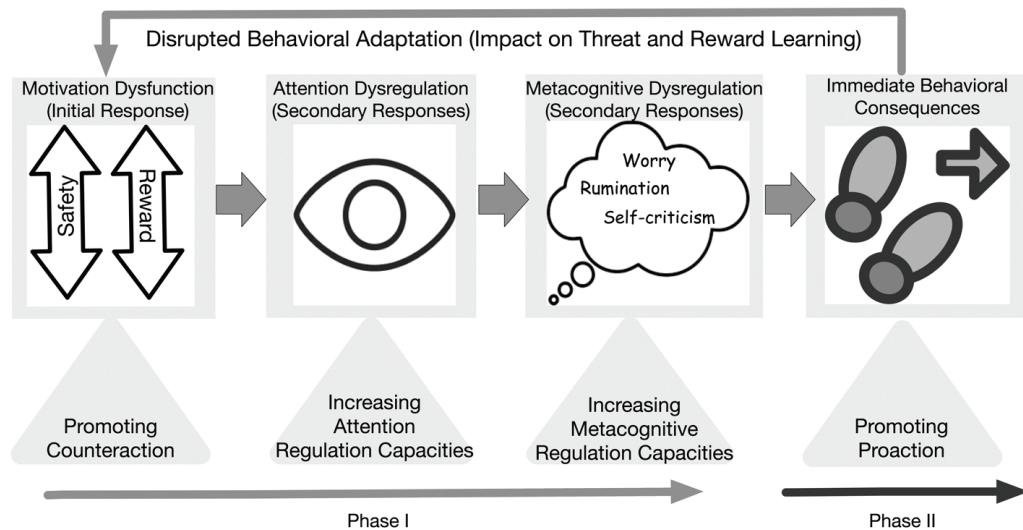


FIGURE 48.1. Functional emotion regulation model of distress disorders.

gains of informal cancer caregivers predicted improvements in the cancer patient's quality of life ($g = 0.90$; O'Toole, Mennin, et al., 2019). We have also recently completed an open trial of ERT for 135 individuals in New York state experiencing COVID-19 pandemic-related distress due to virus contraction, loss of loved ones, discrimination, fears of contraction, and economic hardship. This version consisted of eight virtual ERT sessions supported by an internet-based platform to augment treatment (e.g., video modules, between-session exercises, mindful regulation practices) delivered to a diverse sample (68% non-White; 36% ethnically Hispanic/Latinx). Findings indicate significant pre- to posttreatment improvement with large effect sizes for worry (Cohen's $d = 2.35$), rumination ($d = 2.29$), general distress ($d = 2.75$), anxiety ($d = 1.69$), depression ($d = 1.87$), functional impairment ($d = 1.49$), and life satisfaction ($d = 1.30$; Spaeth et al., 2022).

ERT has also demonstrated significant treatment-related changes in target mechanisms associated with clinical improvement. For instance, ERT was associated with self-reported gains in attentional and metacognitive regulation capacities with moderate to large within- ($g = 0.6\text{--}2.6$; Applebaum et al., 2020; Renna et al., 2018) and between-subjects effect sizes ($g = 0.5\text{--}1.0$; Mennin et al., 2018; O'Toole, Renna, et al., 2019). Gains in these attentional and metacognitive regulation abilities mediated treatment changes in perseverative negative thinking, anxiety, and depression symptoms (e.g., Mennin et al., 2018). This finding has been replicated and expanded in our trial comparing 8- versus 16-session versions of ERT demonstrating numerically stronger mediation effects for the 16-session version as compared to the eight-session version through a 2-year follow-up. Relatedly, we also examined the indirect effects of emotion regulation skill building on clinical outcomes in informal cancer caregivers who received ERT compared to a wait-list control (O'Toole, Mennin, et al., 2019) and found indices of emotion regulation ability, including metacognitive skills-mediated reductions in distress, worry, and burden (O'Toole, Mennin, et al., 2019).

A secondary analysis of weekly assessments revealed that gains in decentering and reappraisal, assessed weekly, temporally preceded reductions in weekly anxiety symptoms and worry (O'Toole, Mennin, et al., 2019), with findings largely replicated in our trial for informal cancer caregivers (O'Toole et al., 2021). Further, ERT produced attention regulation changes as indexed by task-related changes in conflict monitoring, demonstrating increased attentional observing and sustaining ability (Renna et al., 2017). Finally, using functional magnetic resonance imaging, ERT-linked changes in seed-based resting state connectivity revealed increased connectivity between the posterior cingulate cortex, a hub of the default mode network associated with experiential and nonjudgmental self-reflection, and the dorsolateral prefrontal cortex, a hub of the frontal executive control network implicated in voluntary emotion regulation. This increased neural activation correlated with decreases in clinical severity ($r = -.42$ to $-.57$), increases in flexible attention ($r = .34\text{--}.51$), and gains in metacognitive regulation capacity ($r = .32\text{--}.40$; Scult et al., 2019).

Conclusions and Future Directions

Distress is a transdiagnostic factor that results in considerable suffering and public health burden by complicating the course, duration, severity, and treatment of emotional and medical conditions. Distress is particularly difficult to treat given the presence of salient emotional responses and subsequent negative self-referential processes that exacerbate and maintain the symptoms associated with these conditions. ERT targets these processes

by drawing on affective science to improve intervention for individuals struggling with distress through a focus on elucidating motivational responses, improving regulatory abilities, and increasing behavioral adaptation. Previous trials of ERT have demonstrated considerable preliminary evidence for its ability to treat distress disorders and identify potential mechanisms that may underlie this efficacy.

Future research is needed to further identify the specific ways that the treatment may ameliorate the psychological, physiological, and contextual aspects of distress. For instance, using a multiphase optimization strategy (i.e., a research framework, based in engineering principles, for determining the most efficient and effective version of an intervention; Collins, 2018), we seek to determine the optimal dose and sequence of the putative active ingredients of ERT to achieve acute and enduring treatment response. We are initiating trials utilizing adaptive intervention methodologies, such as the sequential, multiple assignment, randomized trial (Collins et al., 2014), as well as micro-randomized trials (i.e., randomly adjusting the delivery of treatment principles within person, thereby enabling the modeling of causal effects and time-varying effect moderation for individual intervention components). In essence, this methodology allows researchers to examine when and how skills utilization in everyday life leads to a clinical response (Nahum-Shani et al., 2018).

Last, as the field of mobile health matures to combine passive and wearable censor technology with sophisticated computational modeling (Picard, 2010), treatments like ERT, which seek to cultivate the skills necessary to resolve momentary instances of distress, are ripe to implement just-in-time adaptive intervention methodology to contextually and dynamically adjust the type, timing, and dose of treatment principles so that patients receive support, in everyday life, in near real time. Just-in-time adaptive interventions, when combined with passive sensor and active input from the individual, can monitor the dynamics of an individual's internal state and context in real time and offer support flexibly in terms of time and location (Nahum-Shani et al., 2018).

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CHAPTER 49

Affect Regulation Training

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Affect regulation training (ART) draws on theories and empirical evidence indicating that a lack of adaptive responses toward unwanted affective states is an important factor in the development and maintenance of various mental disorders (see Sections IX and X, this volume). These theories and findings suggest that transdiagnostic interventions that focus on enhancing adaptive emotion regulation might be valuable additions to disorder-specific treatments (Berking, Wupperman, et al., 2008). To specify treatment targets for such interventions, we developed the ART model of adaptive emotion regulation (see Figure 49.1). Our model conceptualizes adaptive responses to undesired affective states as a situation-adapted interplay of the following skills: (1) awareness of one's emotions, (2) correctly identifying and labeling one's emotions, (3) developing a helpful model explaining what triggered the emotion and what maintains it, (4) compassionately supporting oneself (i.e., self-soothing/-encouraging/-guiding) when coping with undesired emotions, (5) actively modifying undesired emotions, (6) consciously accepting and tolerating undesired emotions when necessary, and (7) confronting (vs. avoiding) situations that could trigger undesired emotions when necessary to attain important goals (see Berking & Whitley, 2014, for further details).

The ART Model also posits that while all 7 ART skills are effective at enhancing affect regulation in the long run, paradoxically, all of them except compassionate self-support (Skill 4) may initially increase the intensity of the undesired emotions to be coped with. For example, identifying one's present feelings as stress, fear, anger, sadness, shame, and so on activates semantic concepts that are likely to incite further negative feelings through excitatory associations in the semantic/neuronal network. Similarly, working to understand present affective states involves consciously processing significant problems, as well as being confronted with one's inability to solve them quickly, and, hence, arguably leads to exacerbated negative affect. Likewise, efforts to modify undesired affective states are often unsuccessful or at least not as successful as expected or desired, hence, triggering disappointment, frustration, and even despair. Finally, attempts to accept and tolerate an emotion could easily become associated and confused with feelings of helplessness and

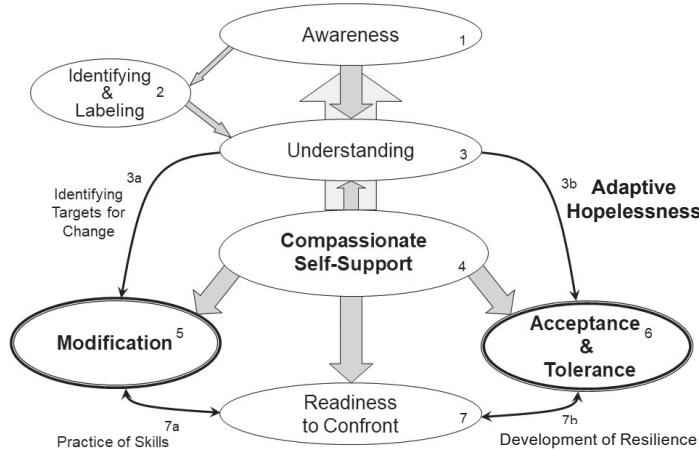


FIGURE 49.1. The ART model of emotion regulation.

hopelessness, or become convoluted with unrealistic fears of catastrophic consequences anticipated to ensue when negative affective states are no longer suppressed.

As illustrated by these examples, the process of applying adaptive skills likely leads to an initial mood deterioration and, hence, may trigger the use of strategies that effectively reduce negative feelings in the short run, but lead to undesired long-term consequences (e.g., when fear is curbed with alcohol). The ART model proposes that the skill of compassionate self-support (see Figure 49.1, number 4) can be used to confine emotional distress within a window of tolerance and facilitate the sustained use of potentially adaptive skills. Therefore, compassionate self-support (conceptualized in ART as the systematic utilization of self-compassion, self-soothing, self-encouragement, and of the initiation of active problem solving) is an integral part of successful emotion regulation. In addition to the list of skills and specific assumptions about how they interact, the ART model furthermore postulates the hypothesis that only modification and acceptance/tolerance skills are indispensable for mental health. All other ART skills included in the model are considered relevant only to the extent that they facilitate the successful application of modification or acceptance/tolerance.

Evidence for the ART Model of Emotion Regulation

To evaluate the validity of the model, we developed and validated the Emotion Regulation Skills Questionnaire (ERSQ; Berking & Znoj, 2008; English version by Grant et al., 2018). Applying this measure it was shown that all seven skills included in the model were associated with a broad range of indicators of mental health and of adaptive emotion regulation (e.g., Afshadi et al., 2023; Berking et al., 2011, 2012; Berking, Ebert, et al., 2013; Berking, Wupperman, et al., 2008; Berking & Znoj, 2008; Fujisato et al., 2017, 2020; Grant et al., 2018; Hirsch et al., 2018; Kaya & Günaydin, 2023; Klocek et al., 2022; Kristiña-Everte et al., 2021; Lincoln et al., 2015; Lukas et al., 2018; Mohammadi et al., 2015; Orozco-Vargas et al., 2021; Paucsik et al., 2023; Schuenemann et al., 2022; Vatan & Kahya, 2018).

Further studies demonstrated that emotion regulation skills assessed with the ERSQ predicted subsequent indicators of psychopathology over a 2-week and a 5-year period

(Berking, Orth, et al., 2008; Berking, Wirtz, et al., 2014; Wirtz et al., 2014), relapse after treatment for alcohol dependency (Berking et al., 2011), symptom reduction during treatment for depression (Lindqvist et al., 2023; Radkovsky et al., 2014), subjective stress responses in individuals meeting criteria for psychotic disorders (Lincoln et al., 2015), and relapse after completion of inpatient treatment for depression (Ebert et al., 2017). Additionally, the availability of adaptive emotion regulation skills assessed with items from the ERSQ predicted the prospective absence of binge-eating episodes in an ecological momentary assessment study with individuals meeting criteria for binge-eating disorder (BED; Svaldi et al., 2019).

In another ecological momentary assessment study, it was shown that emotion regulation skills assessed with the ERSQ moderated the association between stress and paranoia in paranoia-prone individuals (Krkovic et al., 2018). Finally, it was shown that the associations between childhood trauma and depression (Hopfinger et al., 2016), self-compassion and depression (Diedrich et al., 2017), changes in amygdala activation and symptom reduction during treatment for depression (Doerig et al., 2016), and changes in eating disorder symptoms and treatment status (ART vs. wait-list control condition) were all mediated by (changes in) emotion regulation skills assessed with the ERSQ (Hopfinger et al., 2016).

It is noteworthy that the ERSQ asks participants about their ability to respond to *feelings*. Thus, findings reported above also provide support for the assumption that the skills addressed in the ART model are helpful for adaptively responding to affective states in general (including stress, emotions, mood states, and motivational impulses; see Gross, this volume). In sum, these findings provide evidence for the hypothesis that emotion/affect regulation skills, as conceptualized in the ART model, help maintain or restore mental health and are, hence, a promising target for the treatment of various mental health problems.

A Brief Description of ART

Building upon the ART model of adaptive emotion regulation, we synthesized elements from cognitive-behavioral therapy (CBT), mindfulness-based approaches, compassion-based treatments, emotion-focused therapy, acceptance and commitment therapy, dialectical behavior therapy, neuropsychotherapeutic translational approaches, problem-solving therapies, strength-focused approaches to psychotherapy, and techniques we designed in our clinical practice to develop a comprehensive and highly structured treatment that focuses explicitly and exclusively on enhancing skills that can be used to more successfully cope with *any* undesired affective state (including stress, emotions, moods, and motivational impulses).

In ART, participants are first introduced to the underlying nature of affective states, their evolutionary background, practical purposes, potential risks and benefits, as well as the (neural) mechanisms involved in regulating affective processing. Drawing on these mechanisms, seven skills are subsequently deduced and focused upon in the training. These skills include: (1) muscle relaxation; (2) breathing relaxation; (3) nonjudgmental awareness; (4) acceptance and tolerance; (5) compassionate self-support; (6) analysis of one's emotions; and (7) modification of the quality, intensity, or duration of undesired affective states. Each skill is first taught in a long version and subsequently shortened each time another skill is added. At the end of the training, participants should be able to apply the skill in a short period of time (3–30 seconds). The combined sequence of skills (the so-called *ART sequence*; see Figure 49.2) can then be applied to respond adaptively to any kind of undesired affective state.

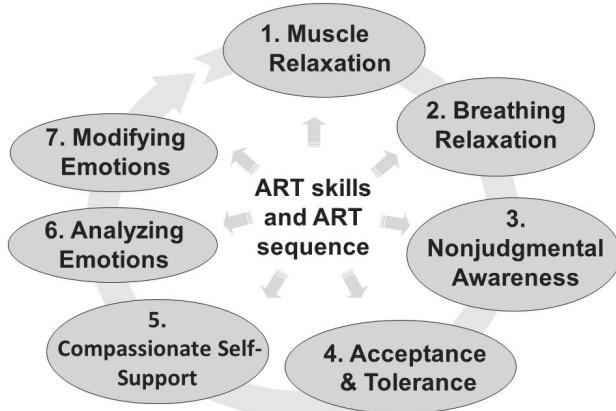


FIGURE 49.2. ART skills and ART sequence.

To help participants master the ART sequence, ART aims to engage participants in an intense training that includes at least 20 minutes of independent training per day for about 6 weeks. For this purpose, a standardized set of progressive exercises has been developed that includes seven guided contemplations (each is about 20 minutes long and can be delivered with the help of the *ART audio training*, which is included in the *ART app*), and a set of about 140 short messages that can be sent to participants through an automatic email/text message delivery system or through the ART app. To help maintain the effects after the training is completed, ART trainers work to transform the exercises into self-reinforcing rituals that patients are invited to practice on a daily basis for as long as possible, even if they have completely recovered from the present episode of mental health problems (see Berking & Whitley, 2014, for a more detailed description of ART).

Efficacy of ART

Preliminary evidence for the efficacy of ART comes from experimental studies evaluating skills integrated in ART. For example, self-compassion as conceptualized in ART was shown to effectively decrease depressed mood (Diedrich et al., 2014; Ehret et al., 2018) and effectively foster the efficacy of reappraisal in a sample of clinically depressed individuals (Diedrich et al., 2016), as well as to reduce symptoms related to mood and eating disorders in a sample of individuals meeting the criteria for bulimia nervosa (Hessler-Kaufmann et al., 2020). Further preliminary evidence comes from studies with nonclinical and subclinical samples showing that ART effectively enhances emotion regulation skills (Berking et al., 2010; Wittkamp, Krkovic, & Lincoln, 2023) and reduces symptoms of anxiety, depression, and stress (Lotfi et al., 2020).

More specific evidence comes from a study with 298 diagnostically heterogeneous inpatients showing that integrating ART into CBT improves treatment outcomes (Berking, Wupperman, et al., 2008). These findings were replicated in a randomized controlled trial with 431 inpatients all meeting criteria for major depressive disorder (MDD; Berking, Ebert, et al., 2013). Two other randomized controlled trials showed that ART was also effective as a stand-alone intervention for MDD (Berking et al., 2019) and BED (Berking et al., 2022). Finally, a treatment that integrated components of ART has been

shown to be effective in another randomized controlled trial of individuals suffering from persistent medically unexplained symptoms (Kleinstäuber et al., 2019).

In sum, there is robust evidence for the efficacy of ART as a treatment for several types of mental disorders. This is remarkable insofar as, in all instances, ART was not at all, or only minimally, adopted to the particular disorder that was being treated. Thus, the findings are aligned with the hypothesis that deficits in affect regulation skills are an important sustaining factor and, hence, a promising target in the treatment of a broad range of mental disorders. As such, transdiagnostic interventions that demonstrate efficacy with regard to fostering affect regulation skills, regardless of the patient's specific diagnosis, could be useful alternatives or complements to disorder-specific treatments. For example, such treatments could be used whenever therapists working in private practice aim to make use of group-based treatments but have difficulties recruiting a sufficient number of patients with the same disorder.

Future Directions for ART

Several limitations of our basic research on affect regulation, of ART as a clinical intervention, and of our studies evaluating the efficacy of ART need to be addressed in future research. For example, our team has made extensive use of self-reports in an area that is difficult to assess through introspection. Moreover, in the ERSQ, participants are asked whether they could successfully apply certain skills to their "feelings." However, a patient with depression might be referring to different "feelings" than a participant suffering from an anxiety disorder. Thus, the instrument may refer to different affective states in different participants, and the extent to which these particular difficulties are valid indicators of their *general* emotion regulation skills is unclear. Additionally, many assumptions in our model (e.g., that the application of potentially effective skills might lead to a short-term mood deterioration, that this mood deterioration enhances the risk that patients discontinue the use of effective strategies, and that compassionate self-support facilitates the sustained use of potentially effective strategies) are primarily based in our observations in clinical practice and have yet to be empirically investigated with greater scrutiny.

With regard to ART as a clinical intervention, it is noteworthy that, in spite of the obvious advantages of transdiagnostic interventions (e.g., use in cost-effective group-based treatment formats), potential disadvantages (e.g., risk of neglecting relevant characteristics of particular disorders) should be carefully considered. Furthermore, it is of note that the current ART program teaches a broad range of affect regulation skills in person and takes at least 18 hours to complete. This comparatively long face-to-face period interferes with the goal of easy dissemination of any evidence-based intervention. Thus, future research should consider whether ART can be shortened or delivered (partly) as a web-based intervention.

With regard to outcome research, it needs to be acknowledged that available studies on ART still address only a limited number of disorders. While there are studies presenting significant evidence for the efficacy of ART in depression, some evidence for the efficacy of ART in BED, and preliminary evidence for the efficacy of ART in individuals suffering from medically unexplained symptoms, as well as in diagnostically heterogeneous patients, studies on other disorders are still lacking. Thus, the claim derived from the theoretical underpinnings and the procedures used in ART that the training is effective for a broad range of mental disorders has yet to be evaluated with a larger number of mental disorders. Additionally, there is a lack of studies comparing ART with the current gold standard for each disorder.

To overcome these limitations, we have initiated several research projects in which we are developing machine-learning methods to assess specific affective states and respective regulation activities based on facial expressions (e.g., www.empkins.de). Additionally, we have developed and validated a modified version of the ERSQ, which assesses affect regulation skills separately for various affective states (see Ebert et al., 2013, for the preliminary German version of the Affect Regulation Skills Questionnaire [ARSQ]¹). To further enhance the efficiency of ART, we have developed and validated a new version of an approach–avoidance modification training (AAMT) in which the display of emotions is used to move stimuli on a smartphone screen. For example, a patient who is alcohol dependent is shown either alcohol- or abstinence-related stimuli and is invited to push alcohol-related stimuli away from him- or herself by displaying the emotion of disgust, sadness, anger, or fear, and is invited to pull abstinence-related stimuli toward him- or herself by displaying emotions such as happiness, joy, satisfaction, or pride. As ART strongly focuses on the message that it is often more helpful to utilize challenging emotions instead of trying to avoid them, such emotion-based AAMTs could be used to effectively link the topic of emotion regulation to the specific disorder(s) the patient is suffering from. Finally, we have developed an e-mental health version of ART combining the app-based presentation of ART exercises with telecoaching that supports participants with their skill-building exercises and, subsequently, with the application of the ART skills in their daily life.² Currently, we are evaluating the efficacy of this intervention in a randomized controlled trial. We trust these endeavors will make subsequent versions of ART even more effective and accessible.

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¹An English version of the ARSQ can be obtained from M.B.

²For the German version, see www.mentalis-health.com/emotionsregulation.

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CHAPTER 50

Dialectical Behavior Therapy

BALANCING ACCEPTANCE AND CHANGE TO ENHANCE EMOTION REGULATION

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Dialectical behavior therapy (DBT; Linehan, 1993) is one of the most empirically supported treatments for borderline personality disorder (BPD; Storebø et al., 2020) and consists of a suite of individual therapy, skills-training modules (mindfulness, emotion regulation, distress tolerance, interpersonal effectiveness; Linehan, 2015), 24-hour phone consultation, and therapist consultation. DBT is based on Linehan's (1993) biosocial model, which specifies that BPD is the result of a transaction between an individual biologically vulnerable to emotion dysregulation and a chronic invalidating rearing environment. Given its theoretical underpinnings, adaptations of DBT or its components (e.g., skills training only) have since evolved as a treatment option for other disorders (e.g., substance use disorder: Warner & Murphy, 2022; eating disorders: Bankoff et al., 2012) and transdiagnostic groups characterized by emotion dysregulation (Neacsu et al., 2014). While evidence for the application of DBT for other populations is promising, the most robust evidence base for DBT is for the treatment of BPD and thus is the focus of this chapter.

DBT: An Intervention for Emotion Dysregulation

Linehan (1993) defines “emotion dysregulation” as dysfunctions that occur in an individual’s emotion *generative* process (i.e., heightened sensitivity and intense responding to emotionally salient stimuli, slow recovery of the emotion) and emotion *regulation* (ER) process (i.e., problems with shaping which emotions one experiences, when one has them, and how they are experienced or expressed; Gross, 1998). Linehan proposes that an individual’s biological predisposition to emotion dysregulation, coupled with a chronic

transaction with an invalidating environment (i.e., one in which an individual's private experiences are trivialized, ignored, and/or punished), exacerbates the person's emotion dysregulation and, over time, leads to the development of the BPD. DBT is therefore rooted in the theory that improvements in emotion dysregulation is a key mechanism accounting for therapeutic outcomes. A recent investigation of individuals with BPD or BPD traits found that improvement in ER was the only skill uniquely associated with improvements in clinical outcomes in DBT (Lee et al., 2022)—however, a DBT meta-analysis (Harvey et al., 2019) reported that changes in ER scores ranged from small to large, indicating high variability of ER outcomes (Gratz & Roemer, 2004). While methodological differences and weaknesses might account for these findings (e.g., few studies measured whether DBT was administered per protocol), it is also likely that DBT, while effective at improving emotion dysregulation, can "do better." To this end, the aim of this chapter is to review key DBT strategies and skills that theoretically target elements of emotion dysregulation, and offer directions informed by basic affective science to enhance the treatment's ability to do so.

DBT Targets Emotion Dysregulation via Dialectical Balance of Acceptance and Change

The dialectical worldview underpinning of DBT holds that there are opposing stances inherent in the world, and by simultaneously upholding these stances (i.e., a "thesis" and "antithesis") a "synthesis" is reached, which ultimately facilitates therapeutic outcomes (Linehan, 1993). The overarching dialectic of DBT is that of acceptance and change; DBT therefore aims to target dysfunction in the emotion-generative and regulation process with a balance of acceptance and change-based strategies.

DBT Acceptance Strategy: Validation

Validation is the primary DBT acceptance-based strategy that theoretically targets the affective consequences of the invalidating environment. It is used strategically as a therapeutic technique by the therapists and is also taught to clients as a DBT skill (i.e., self- and other-validation). Validation refers to acknowledging "what is," and communicates that one's "responses make sense and/or are understandable within their current life context or situation" (Linehan, 1993, pp. 222–223). Theorists propose that validation is a key mechanism of change in DBT by having ER functions and mitigating the frequency, intensity, and duration of one's emotional response (Lynch et al., 2006; Shenk & Fruzzetti, 2011). Consistently, experimental studies indicate that individuals receiving validating feedback during a math stressor task (e.g., "I too would feel upset if I were the one completing the task") exhibit decreases in heart rate (Shenk & Fruzzetti, 2011). In addition, pain studies indicate that participants receiving validating responses to reports of pain experience less worry and more positive affect than those receiving invalidating responses (Linton et al., 2012), as well as decreases in pain, negative affect, and frustration (Vangronsveld & Linton, 2012). Moreover, a recent experimental study (Kuo et al., 2022) suggests that individuals with higher dispositional levels of emotion dysregulation exhibit greater reductions in negative emotion after being validated for their reports of shame or sadness but less so for their reports of fear. In sum, though emerging research indicates that validation is associated with reductions in negative emotion, data are limited, and the extent to which validation impacts other elements of the emotion-generative processes (e.g., sensitivity or slow emotional recovery) remains unclear.

DBT Change Strategies

DBT change strategies consist of hundreds of skills and therapeutic techniques used in standard cognitive-behavioral therapies. Indeed, a review of how these technologies of change impact emotion-generative and regulative processes is beyond the scope of this chapter—however, Gross and Jazaieri's (2014) model of the relationship among emotion generation, ER, and psychopathology is a useful framework to understand some key DBT strategies and skills that likely lead to improvements in these processes. The authors highlight that emotion dysregulation in psychopathology is characterized by either ER failures (i.e., not engaging in an ER strategy when it would be helpful to do so), or emotion misregulation (e.g., inadequately matching an ER strategy to a specific context). They therefore propose that this process entails targeting (1) *awareness of the emotion* and the relevant context, (2) *knowledge of short- and long-term ER goals* (i.e., what an individual aims to achieve with regard to their emotion), and (3) *skillful selection and implementation of the ER strategy*. Below is a review of key DBT skills and therapeutic strategies that theoretically engage each of these processes and the extant evidence supporting their effectiveness.

Awareness of the Emotion

A central DBT skill that aims to facilitate awareness of one's emotions is mindfulness of the emotion (Linehan, 2015). Mindfulness refers to “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 4). Though commonly conceptualized as an acceptance-based strategy, Linehan (1993) states, “Therapeutic change can only occur in the context of acceptance of what is; however, ‘acceptance of what is’ is itself change” (p. 99). Therefore, although acceptance is a core element of mindfulness, in DBT, the practice of mindfulness dialectically embodies both acceptance and change.

DBT cultivates mindfulness through teaching and strengthening several mindfulness “subskills,” such as observing, labeling, and describing one's emotions, and doing so without judgment (Linehan, 2015). The association between the use of these subskills and reductions in emotional intensity have robust empirical support. Indeed, labeling one's emotion has been shown to be associated with reductions in amygdala activity in healthy controls (Lieberman et al., 2007) and greater increases in vagal activity among individuals with BPD relative to healthy controls (Fitzpatrick et al., 2019). As well, mindfully observing one's emotion is associated with greater reductions in physiological indices compared with various control and non-acceptance-based strategies (e.g., suppression) and across a range of emotionally evocative contexts (Hofmann et al., 2009; Keng et al., 2017; Wilson et al., 2014). Finally, DBT skills have also been shown to lead to greater increases in emotional awareness than treatment as usual (TAU; Neacsu et al., 2014).

Notably, of the many facets of mindfulness (e.g., awareness, acceptance, nonjudgment; Baer et al., 2004), theory and research indicate that nonjudgmental awareness of the emotion is a key element that likely influences the emotion-generative processes. For instance, Gross and Jazaieri (2014) write that “more awareness is not always better” (p. 393) and illustrate how a critical component of panic disorder is awareness of one's physiological arousal with a negatively biased appraisal. Consistently, a study by Krantz and colleagues (2018) highlights the importance of nonjudgment in the context of DBT specifically. In a sample of individuals with BPD randomized to either 20 weeks of DBT skills training or a wait-list control, the authors found that the significant effect of DBT on reductions in self-harming behaviors was accounted for by acceptance without

judgment specifically—observing, describing, and acting with awareness did not explain this relationship. Indeed, these findings suggest that, rather than simply being “aware” of one’s emotion, fostering nonjudgmental awareness of one’s emotion is likely a particularly fruitful avenue toward improving ER and DBT outcomes.

Knowledge of Short- and Long-Term ER Goals

Problematic ER occurs when individuals fail to effectively balance their short- and long-term goals while considering what they want to achieve with regard to their specific emotion (Gross & Jazaieri, 2014). In DBT, problem behaviors, such as self-harm, are conceptualized as regulatory efforts that achieve the immediate, short-term goal of reducing negative emotion (e.g., anxiety) but lead to long-term negative affective (e.g., shame over engaging in self-harm) or behavioral consequences that impede one’s ability to live in accordance with their life values (e.g., maintaining long-term relationships). Thus, effective ER requires that an individual mindfully considers both the short- and long-term consequences of a regulatory strategy before selecting a strategy. Evidence suggests that failures to effectively balance short- and long-term goals, especially in the face of negative emotions, is characteristic of BPD (Cackowski et al., 2014; Krause-Utz et al., 2016) and BPD traits are associated with a preference for ineffective emotion goals (López-Pérez & McCagh, 2020).

DBT aims to enhance judicial balancing of short- and long-term ER goals via several skills in the mindfulness module, most notably via the “wise mind” skill (Linehan, 2015). Wise mind refers to an individual’s inherent wisdom that integrates and values both reason and emotion. Through engagement of wise mind, individuals are encouraged to mindfully weigh the short- and long-term consequences of their behaviors and make decisions that are in line with their long-term, values-consistent goals. As well, the stop, take a step back, observe, and proceed mindfully (STOP) skill from the distress tolerance module is a skill that integrates both cognitive and mindfulness strategies and encourages the individual to pause, take a breath, observe and assess the situation, and proceed mindfully (Linehan, 2015). At present, the use of the wise mind and STOP skills as tools to enhance judicial balancing of short- and long-term goals is largely theoretical and warrants direct empirical investigation.

Skillful Selection and Implementation of ER Strategies

Theories from basic affect science emphasize that skillful ER includes selecting the most appropriate ER strategy in a given context and successfully implementing the strategy to achieve emotion-regulatory goals (Gross & Jazaieri, 2014). The DBT skills modules collectively aim to enhance skillful selection and implementation of ER strategies by offering clients a “buffet” of several ER skills informed by affective and clinical research. Consistently, Neacsu et al. (2014) reported that DBT skills lead to greater access of ER strategies than those in TAU—however, although the DBT skills manual presents a plethora of ER strategy options, it currently offers little guidance on *which* strategies to select *and under which conditions*.

It is proposed that DBT could enhance its guidance of which ER skills one should select and implement by drawing from theories and research from basic emotion science. Indeed, emotion theories and evidence indicate that “not all ER strategies are created equal.” Effective ER strategy choice encompasses several factors, such as (1) how effective a given strategy is at reducing emotional intensity (Webb et al., 2012); and (2) flexibly

matching an ER strategy to varying situational demands, such as the intensity of an emotion and one's available cognitive resources (Sheppes et al., 2011). Webb et al.'s meta-analysis examining the effectiveness of different categories of ER strategies based on Gross's (1998) process model revealed that some categories of strategies are more effective than others (e.g., cognitive change over attentional deployment) and, even *within* categories (e.g., attentional deployment), some strategies are more effective than others (i.e., distraction is effective, concentration is not). As well, emotion theorists propose that distraction is the best "match" for high emotional intensity contexts where cognitive resources are limited, whereas reappraisal may be more fitting under low emotional intensity conditions where an individual has more cognitive resources available (Sheppes et al., 2011).

Individuals with BPD or elevated BPD features select ER strategies that are not fitting to the context and/or ER goals (López-Pérez & McCagh, 2020), and may exhibit a preference for ER strategies considered less effective at reducing emotions (e.g., suppression; Daros & Williams, 2019) or avoidance-related strategies (e.g., distraction; Kuo et al., 2018; Sauer et al., 2016). Indeed, findings from the affective science literature indicate that individuals with BPD may benefit from more direct guidance on which strategies are more or less effective and which strategies to choose and when—for instance, choosing distraction under high emotional intensity conditions and "check the facts," a cognitive change strategy, under lower-intensity conditions when more cognitive resources are available.

After an ER strategy is selected, the individual needs to effectively implement the skill to modulate the emotion. Problematic implementation of ER strategies is conceptualized as a hallmark of emotion dysregulation in BPD (Linehan, 1993). Thus, DBT aims to target problematic implementation of ER strategies via skills acquisition (i.e., teaching the client the skill), strengthening of the skill with repeated practice, and generalizing the skill across contexts. Interestingly, though somewhat mixed, findings from experimental studies using experiential and physiological indicators suggest that individuals with BPD are, in fact, able to successfully implement emotion strategies when cued (see Fitzpatrick & Dixon-Gordon, this volume) and even strengthen the effectiveness of the strategy (i.e., mindfulness) with repeated implementation (Metcalfe et al., 2017)—however, individuals with BPD also appear to exhibit heightened baseline levels of negative emotion (Fitzpatrick et al., 2020; Kuo et al., 2016). The implications of this are critical, as their elevated starting intensity of negative emotion likely requires greater regulatory effort than those of healthy controls. In sum, while individuals with BPD may be able to implement ER strategies as effectively as healthy controls, by having greater baseline emotion intensity, they likely need *superior* regulatory skills. This suggests that clients in DBT would likely benefit from more directed efforts on strengthening ER skills.

Future Directions

Some future directions are proposed. First, while validation is conceptualized as a key acceptance-based DBT strategy with ER functions, studies are sparse and thus far, have focused on the affective consequences of an individual *receiving* validation. What remains unclear are the affective consequences for individuals who validate themselves and/or administer validation to others. In regard to the ER change strategies, the affective science field has delineated several components of emotion generation and regulation that may be problematic in various psychopathologies. DBT research would benefit

from clarifying which components the treatment effectively targets (e.g., problematic emotional awareness, strategy selection, ER implementation) and which components are not adequately engaged. Finally, given emerging research indicating ways to optimize ER strategy selection, future DBT studies should examine whether providing more direct guidance and/or decision aids on which ER skills to use and when they will enhance clinical outcomes.

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CHAPTER 51

Mindfulness Interventions

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JACOB D. HILL

Mindfulness is one of the fastest growing health care trends in America and has piqued the curiosity of health care companies, clinicians, scholars, and the general public over the past several years (Clarke et al., 2018). Indeed, substantial evidence supports the mental and physical health benefits of this centuries-old Buddhist practice (Smith & Langen, 2020). Yet, while the breadth of evidence for mindfulness across a range of mental and physical health outcomes, including depression (Shallcross et al., 2015), anxiety (Oberoi et al., 2020), and chronic pain (Hilton et al., 2017) is strong, the clarity of our understanding of mindfulness, particularly with respect to its integration into a Western scientific framework, is less compelling. For example, most Westernized mindfulness-based interventions (MBIs) developed to improve clinical outcomes are termed *secular*, yet clearly integrate practices and principles of Buddhist spirituality and philosophy. This disconnect not only points to practices of cultural appropriation (Surmitis et al., 2018) but also poses challenges to defining and characterizing the components of mindfulness that may not easily map onto Western ideas, conceptualizations, and scientific models.

This chapter outlines the definition of mindfulness, which we consider at the intersection of Buddhism and its adaptation into Western psychology. We then discuss a common, yet maladaptive type of emotion regulation underlying a range of psychological disorders. In this context, we review how mindfulness training is poised to help. We present evidence for a range of empirically validated MBIs with a focus on format and target population. We follow with a conceptual framework for understanding mindfulness as an emotion regulation strategy. Finally, we end with limitations of extant research and ideas for future directions.

What Is Mindfulness?

Mindfulness was developed over 2,500 years ago within Buddhist contemplative/monastic practices to reduce suffering (Silananda, 1995). According to Buddhist theorizing,

suffering is caused by an inability to perceive moment-to-moment experiences clearly and objectively. Thus, the practice of mindfulness is rooted in honing attention toward four domains that comprise momentary experiences: (1) the body (e.g., physical sensations); (2) feeling tone (i.e., quality of experience felt as pleasant, unpleasant, or neutral); (3) the mind (e.g., thoughts); and (4) *dhammas*, the quality and attitude of mental associations formed within everyday experience that contribute to inaccurate perceptions of the world (Silananda, 1995). The first three domains involve noticing what is present. The fourth domain monitors “hindrances”—that is, mental states, attitudes, and impulses about the first three domains that cause suffering. One key example of a hindrance is the phenomenon of clinging to and/or avoiding present-moment experiences. We discuss this concept as it relates to maladaptive emotion regulation and psychopathology in the sections below.

Psychopathology and MBIs

The Buddhist conceptualization of the hindrance of clinging and avoidance that can lead to suffering converges with modern psychological disorders (e.g., substance use, depression, anxiety) that are characterized by efforts to seek and seize pleasure on the one hand and to avoid or push away what is experienced as unpleasant on the other hand (Fledderus et al., 2010). Within contemporary cognitive and clinical psychological frameworks, this tendency to try to avoid one’s thoughts, feelings, and bodily sensations is known as experiential avoidance, and is widely understood to reflect a disordered emotion regulation strategy that underlies a range of psychological disorders (McCluskey et al., 2020). Examples of specific avoidance-based strategies include rumination, worry, distraction, and suppression. Both rumination and worry involve repetitive self-referential processing and may not, at first glance, appear to be avoidance strategies since they involve engagement with thought—however, each of these involves only passive engagement with thinking—that is, “thinking without awareness of thinking,” which merely imitates problem solving in an attempt to control one’s experience. Distraction and suppression, which involve diverting attention away from unpleasant experiences, can both be associated with positive outcomes if used short term (Campbell-Sills et al., 2006; Liverant et al., 2022)—however, evidence for each of these strategies supports the adage that “what we resist persists,” and over the long term, they can lead to clinical diagnoses, including depression, anxiety, and substance use disorders (Boulanger et al., 2010). Mindfulness offers an alternative strategy that reduces suffering via liberation from the perceived need to alter experience.

Thus, from an overarching conceptual and therapeutic perspective, on the opposite end of the spectrum from experiential avoidance, lies mindfulness, an approach-oriented response to present-moment experience (see Figure 51.1). This approach-oriented strategy underlies the conceptual development of a range of MBIs that are designed to train individuals to actively engage with any and all present-moment experiences with a quality of attention characterized by curiosity and nonjudgment.

While Buddhist philosophy and spirituality conceptualize mindfulness as a state of being or a “way of life,” Western ideology conceptualizes mindfulness as a set of skills that can be trained and integrated into a therapeutic treatment for mental and physical disorders. These skills are taught and practiced within the context of MBIs. MBIs are structured facilitator-led training protocols that share similarities in their approach and practices. As such, it can be confusing to understand which MBI(s) a patient should be

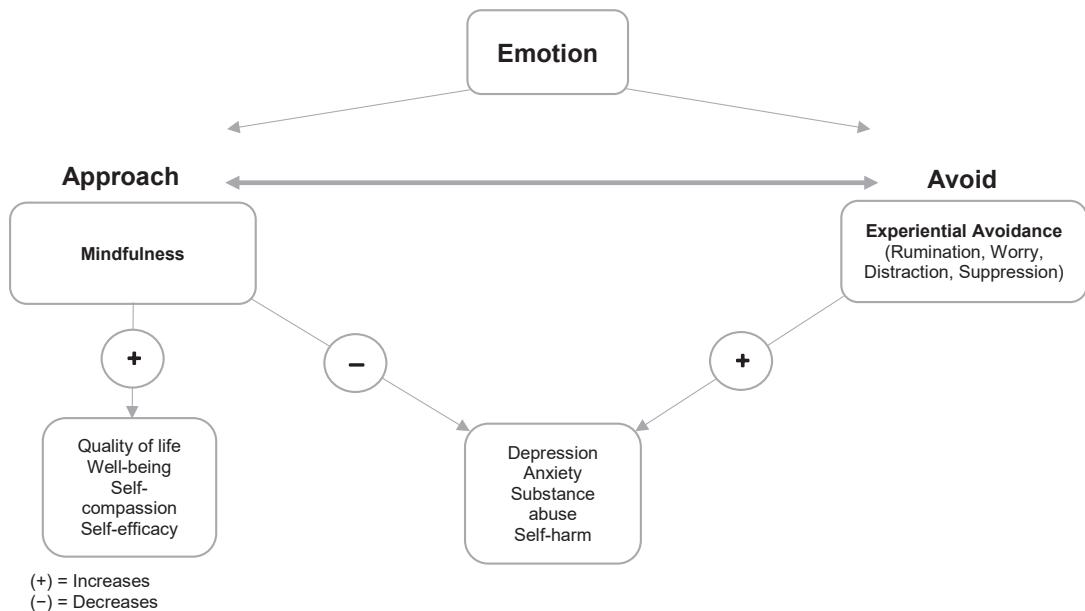


FIGURE 51.1. Approach- versus avoidance-based emotion regulation and health outcomes.

prescribed given a particular diagnosis. Here, we review MBIs with the greatest breadth of clinical evidence and briefly summarize the rapidly expanding clinical evidence that support which MBIs are best suited for specific patient populations.

Mindfulness-Based Stress Reduction

Mindfulness-based stress reduction (MBSR) was developed in 1979 by Jon Kabat-Zinn (1982). It is an 8-week program with 2.5-hour facilitator-led weekly sessions. Treatment components include structured meditation, mindful movement, body scans, formal and informal mindfulness practices, daily at-home practices, and a 1-day silent retreat. The program is provided in group settings of 10–40 individuals. While MBSR is associated with improvements across a range of mental (e.g., reduced stress, depression) and physical (e.g., reduced fatigue) health outcomes in clinical and nonclinical samples (Grossman et al., 2004), the strongest evidence for MBSR's effects is for reduction of chronic pain (Smith & Langen, 2020).

Mindfulness-Based Cognitive Therapy

Mindfulness-based cognitive therapy (MBCT) was developed to prevent depression relapse in individuals with a history of recurrent major depressive disorder. The program also includes eight weekly 2.5-hour sessions and shares many practices with MBSR but includes smaller group sessions (maximum 10 participants) led by a trained mental health professional. It also includes practices from traditional cognitive-behavioral therapy that target emotion and cognitive pathways (e.g., emotional reactivity, rumination) involved in depression relapse. The strongest evidence for MBCT is for preventing depression relapse and reducing depressive symptoms (Kuyken et al., 2016).

Mindfulness-Based Relapse Prevention

Mindfulness-based relapse prevention (MBRP) was developed to follow intensive substance abuse treatment to prevent relapse and combines elements of cognitive-behavioral skills training and addiction treatment (Witkiewitz et al., 2013). The program includes eight weekly 2-hour sessions with formal and informal mindfulness practices with a focus on awareness of environmental triggers for relapse, eliciting and increasing exposure to cravings, coping strategies, and maintenance of relapse prevention (Ramadas et al., 2021). Clinical trials of MBRP demonstrate reductions in substance use relapse, including alcohol, methadone, tobacco, stimulant, and opioid use (Ramadas et al., 2021).

Acceptance and Commitment Therapy

Acceptance and commitment therapy (ACT) was developed as a transdiagnostic treatment that teaches principles of mindfulness within a flexible format that does not rely exclusively on formal meditation. Recent systematic reviews support that ACT significantly reduces anxiety, depression, and improves psychological flexibility and quality of life among a range of clinical diagnoses, including depression, anxiety, and chronic pain (Gloster et al., 2020).

Dialectical Behavior Therapy

Dialectical behavior therapy (DBT) was developed to address suicidality in women with borderline personality disorder, but also has evidence for treating binge-eating disorder, substance use disorder, and depression (Chapman, 2006). DBT includes five specific functions of treatment: motivating clients, teaching skills to enhance patient capabilities, generalizing skills to natural environments, motivating and improving the skills of therapists, and structuring the treatment environment to ensure optimal learning for the patient and therapeutic capability for the therapist (Reynolds & Linehan, 2002; see Kuo, this volume, for a detailed review of DBT).

While evidence for the overall therapeutic benefit of MBIs is substantial, further work is needed to understand precisely how each MBI leads to improved health outcomes. MBIs are complex interventions that incorporate several potential therapeutic elements, including those specific to mindfulness practices, as well as nonspecific elements, such as interaction with a facilitator and/or support from other group members. Understanding the relative therapeutic contributions of each of these domains is poorly understood—however, emerging research has identified improved emotion regulation as one key therapeutic benefit observed across various MBIs.

Mindfulness and Emotion Regulation

Considering the definition of emotion regulation, which refers to how individuals influence which emotions they have, when they have them, and how they experience or express those emotions, mindfulness may not appear to be an emotion regulation strategy. Unlike other strategies (e.g., cognitive reappraisal, emotional and expressive suppression), mindfulness does not involve any intention to change *which* emotions are experienced or *the timing* of when they are experienced. Mindfulness does, however, directly influence *how*

emotions are experienced. For example, one core training goal of mindfulness is the capacity to experience an emotion without overly identifying with it. This altered relationship to emotion is characterized by an objective and experiential understanding of how our perceptions of, and responses to, present-moment experiences contribute to suffering. In this way, although mindfulness is associated with less suffering (e.g., the experience of less negative emotion; Shallcross et al., 2010), it is best conceptualized as an emotion regulation strategy that alters the *how* rather than the *what* of emotional experience.

While unanimous agreement about the active components of mindfulness is lacking, Buddhist and Western scholars agree that, at its core, mindfulness involves a quality of awareness to momentary experiences characterized by an attitude of openness, curiosity, and nonjudgment. While at times the Western approach has involved attempts to conceptually and mechanistically parse out the process of awareness from the process of nonjudgment or acceptance, it is unclear whether this effort has added clarity or confusion, and to what end (Brito, 2013). One would have to imagine, for example, that acceptance can be achieved without awareness, and that efforts to understand this will lead to clinically significant improvements in patient outcomes. While some attention has been focused on this effort, we concentrate here on preserving Buddhist conceptualizations of the components of mindfulness and synthesizing this with concepts of emotion regulation within a pragmatic clinical model.

Learning to foster nonjudgmental awareness via mindfulness training begins with practices that aim to improve the focus of one's attention. Focused attention to a neutral anchor (e.g., the breath) or an unpleasant sensation can reduce the associated unpleasant feeling tone by preventing or interrupting catastrophic, ruminative, or worry-based thinking that can lead to greater negative emotion (Conti et al., 2020). Training in sustained attention also sharpens one's ability to notice changes in experience, such as momentary shifts in quality, intensity, and location of a sensation. This brings awareness to the continuously changing and temporary nature of present-moment experience and underscores that all sensations, even the feeling tone of intense negative emotion, is transient, and sustained experience of negative emotion is fueled by our responses to it—that is, our perceptions, including judgments, and behavioral reactions. Notably, this understanding is brought about via experience rather than via changes in cognition (e.g., thought restructuring) or behavior (e.g., behavioral activation).

The manifestation of this understanding and capacity to witness how our judgments (e.g., thoughts) and behaviors contribute to unpleasant feeling states and increases in negative emotion is known as *decentering*. At its core, decentering is characterized by the ability to observe present-moment experiences, while at the same time, noticing one's *reactions* to these experiences. This translates to the capacity to distinguish between reality versus reality as we interpret it and allows for the interpretation of experiences (e.g., emotions, thoughts) as objective events in the mind without personally identifying with them (Safran & Segal, 1996). The awareness developed about our perceptions and interpretations of reality is the process by which mindfulness supports emotion regulation without the need for cognitive or behavioral change. Within the Buddhist paradigm, this understanding of the role of perception as a primary contributor to suffering is a core feature of *vipāśyanā*, or sensory clarity and insight (Chavan, 2007), also called *pure awareness*.

Recent Western scientific discourse has produced a complex web of ideas aimed at identifying additional mechanisms of mindfulness, some of which may stem from, or are closely related to, decentering (e.g., improvements in distress tolerance and reductions in self-referential processing; Leyro et al., 2010; Ramel et al., 2004). Additional mechanisms that have been proposed that have unclear relationships with decentering include

improvements in self-efficacy (Turner et al., 2016), self-compassion (Conversano et al., 2020), and increases in cognitive reappraisal (Garland et al., 2011). For the purpose of this chapter, we have focused on decentering as a core process by which mindfulness supports emotion regulation and that is supported by the Buddhist concept of pure awareness. This approach preserves Buddhist conceptualizations of the goals of mindfulness and prioritizes the focus on a process that has increasing empirical support as a mechanism by which MBIs can improve disordered emotion regulation among people with clinical psychological disorders (Bieling et al., 2012; Farb et al., 2018).

Directions for Future Research

Widespread interest in mindfulness among Western scholars, practitioners, and the public has created a field ripe for dialogue and deeper query about the nature of mindfulness. Here we consider the idea that although mindfulness training does not target the type, amount, or timing of emotional experience, it does directly target *how* we experience emotion (via decentering) and is thus, at its core, an emotion regulation strategy that can be practiced and integrated into MBIs to reduce suffering.

Challenges of future research include reconciling the Buddhist origins of mindfulness with Western conceptualizations, as well as scientific rigor (e.g., standardizing the delivery of MBIs, as well as instruments to measure mindfulness across studies). Western scholars and clinicians would ideally strike a skillful balance between the modern-day mental health crisis that calls for scalable, accessible, and affordable treatment approaches with a sensitivity to the cultural origins of mindfulness and its necessary adaptations for diasporic cultures.

Success overcoming these challenges may be achieved through multidisciplinary collaboration among Buddhist scholars and Western scientists in the areas of social and clinical psychology, behavioral medicine, and health equity. A meeting of these minds has the potential to answer holistic questions at the heart of emotion regulatory components underlying MBIs. This knowledge holds promise for informing the refinement, specificity, efficacy, and adaptation of MBIs within and across cultures. These discoveries at the intersection of treatment development, individual and cultural differences, and health equity have the potential to profoundly improve mental health care and reduce suffering at the level of population health.

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SECTION XI

INTERVENTIONS

Outside the Clinic

CHAPTER 52

Regulation of Anxious Emotion through the Modification of Attentional Bias

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COLIN MACLEOD

People vary in emotional disposition. Partly, this reflects variation in external circumstances—however, it also reflects individual differences in the operation of emotion regulation processes that serve to moderate emotional responses to such circumstances (English et al., 2021). Given that individual differences in emotion regulation contribute to variation in emotional disposition, it follows that emotional resilience partly reflects the operation of adaptive emotion regulation processes, whereas vulnerability to negative emotion and emotional pathology instead reflects in part the operation of maladaptive emotion regulation processes (McRae & Gross, 2020).

Many theorists propose that selective attention is an emotional regulation process that causally contributes to variation in anxiety vulnerability and dysfunction. According to this account, attentional bias toward negative information is a maladaptive emotion regulation process that elevates anxiety vulnerability and pathology, whereas attentional avoidance of such negative information serves the beneficial emotion regulation function of attenuating anxiety (Van Bockstaele et al., 2019).

In the present review, we focus on evidence that attentional bias to negative information causally contributes to anxiety vulnerability and pathology—however, it should be noted that researchers have investigated the role of selective attention in the regulation of other types of emotional experience, such as depression, and to other forms of self-regulation, such as substance misuse and maladaptive food consumption, and there is now considerable evidence demonstrating that anomalous selective attentional processing can causally contribute to these other dimensions (cf. MacLeod & Grafton, 2014). In the current chapter, we first consider work that has demonstrated an association between such

attentional bias and elevated anxiety vulnerability and dysfunction. Next, we consider work that has sought to directly modify attentional bias to negative information, to test the hypothesis that attentional bias functionally contributes to the regulation of anxious disposition. We conclude by considering the applied implications of this research, and suggesting future extensions with the capacity to further understanding and to deliver real-world therapeutic benefits.

The Association between Attentional Bias and Regulation of Anxiety

Several approaches have been employed to assess anxiety-linked attentional bias, but the most common has been the attentional probe task (MacLeod et al., 1986). Participants are presented with pairs of words or images, comprising one negative and one benign member, and are required to identify a visual probe displayed in the locus of one of these stimuli. Attentional bias to negative information is inferred by observed speeding to identify probes presented in the locus of the negative compared to benign stimuli. People who are high in anxiety vulnerability, or have been diagnosed with an anxiety disorder, display disproportionate speeding to identify probes in the locus of the negative stimuli (cf. MacLeod & Grafton, 2016). The robustness of this effect is indicated by the meta-analytic finding that over 11,000 consecutive studies reporting null results would be required to reduce it to nonsignificance (Bar-Haim et al., 2007). This finding is consistent with the hypothesis that attentional bias to negative information is a maladaptive emotion regulation process that contributes to elevated anxiety vulnerability and pathology.

There are three key limitations of this prior work. First, the resulting attentional bias measure has low psychometric reliability (McNally, 2019). Second, the single word and static image stimuli used in such studies have impoverished informational content. Third, the finding that there is an association between such attentional bias and anxiety vulnerability and pathology does not permit the conclusion that this attentional bias causally contributes to such emotional vulnerability and dysfunction. We next consider how researchers have sought to overcome each of these limitations.

To improve the psychometric reliability of the probe task, Grafton et al. (2021) developed a dual probe task variant. Rather than presenting a single probe on each trial, in the locus of either negative or benign information, this new approach involves the simultaneous brief (200-millisecond) presentation of two different probes, one appearing in the locus of each type of stimulus information. Participants must identify any probes they see, and attentional bias to negative information is indicated by a heightened identification of probes presented in the locus of negative rather than benign information. Grafton et al. have shown that this index of attentional bias demonstrates high levels of psychometric reliability (internal consistency = .97).

This dual probe approach also enables the assessment of attentional bias to more ecologically relevant stimulus information, as it can be used to assess selective attention to continuous video stimuli. For example, Grafton et al. (2023) simultaneously presented pairs of video clips to participants, in a dual probe task. In one clip, an individual described negative aspects of a stressful event that participants knew they would be exposed to later in the experimental session, while in the other clip a different individual described benign aspects of this event. This dual probe task revealed that, relative to those low in anxiety vulnerability, participants with high anxiety vulnerability demonstrated greater attentional bias to the videos that conveyed negative information about the experience they were about to undergo. Again, the internal consistency of this dual probe attentional bias

measure was extremely high, at .93. Similar findings have also been obtained by Ventris et al. (under review), again using the dual probe approach to assess selective attentional bias to simultaneously presented video clips in which different individuals described either negative or benign aspects of a stressful event that participants knew they were about to be exposed to. Ventris et al. were able to show that this association between attentional bias to negative information about the upcoming event and elevated anxiety vulnerability was mediated by the development of negative expectancies concerning this upcoming event. These expectancies appeared to be directly driven by increased attention to the videos presenting negative information of this future event. Such findings suggest that negative expectancies about the future may be an important pathway through which attentional bias to negative information contributes to elevated anxiety vulnerability and dysfunction (Aue & Okon-Singer, 2015).

Despite these advances, it remains the case that observing associations between attentional bias to negative information and elevated anxiety vulnerability does not permit the conclusion that this attention bias represents a maladaptive emotion regulation process that causally contributes to elevated anxiety vulnerability. To overcome this third limitation, researchers have sought to directly modify attentional bias to negative information, in order to determine whether this serves to alter anxiety vulnerability, as is predicted by the above described causal account. In the following section, we review work that has adopted this attentional bias modification (ABM) approach to investigate whether attentional bias to negative information causally contributes to elevated anxiety vulnerability and dysfunction.

The Causal Contribution of Attentional Bias to Regulation of Anxiety

It is critically important to draw a distinction between the experimental *procedures* that have been employed with the aim of modifying attentional bias, and the actual *process* of ABM that may (or may not) be driven by these procedures. Clearly, and as we will return to, conclusions concerning the causal contribution of attentional bias to anxiety vulnerability must be based on the observed emotional consequences of successfully eliciting the ABM process.

The most common procedure delivered with the intention of eliciting the ABM process is a variant of the conventional attentional probe task, into which a contingency is introduced. This contingency involves either consistently presenting all probes in the locus opposite the negative stimulus to encourage attentional avoidance of negative information (avoid negative condition), or in the locus of negative information to encourage attentional vigilance for negative information (attend negative condition). MacLeod et al. (2002) delivered this procedure within a single lab session, to participants midrange in trait anxiety. Half received the avoid negative and half received the attend negative condition. Subsequent assessment on the conventional attentional probe task revealed that the procedure successfully elicited ABM, as participants in the former condition came to display reduced attentional bias to negative information, relative to those in the latter condition. Participants were then exposed to a stressor, a challenging anagram task, and anxiety reactivity to this stressor was assessed. Participants in the avoid negative condition displayed attenuated anxiety reactivity to the stressor, relative to participants in the attend negative condition. This demonstration that attentional bias to negative information causally influences anxiety reactivity has been replicated in many other lab-based studies (cf. Jones & Sharpe, 2017).

Encouraged by these laboratory findings, researchers have investigated whether extended delivery of such procedures, either alone or in conjunction with an established therapeutic intervention, such as cognitive-behavioral therapy, can alter anxiety dysfunction within the real world. These studies have typically involved exposing participants either to the above described avoid negative condition, or to a control condition in which no contingency between the negative stimulus and probe position is present. When these procedures successfully reduce attentional bias to negative information, then it commonly is found that they can significantly attenuate anxiety symptoms in people with subclinical anxiety and in those with anxiety dysfunction (cf. Gober et al., 2021). These findings further support the idea that attentional bias to negative information may causally contribute to the impaired regulation of anxious emotion that underpins anxiety dysfunction.

It should be recognized, however, that procedures intended to elicit the process of ABM, in a manner designed to reduce attentional bias to negative information, have not always been successful in doing so. When these procedures have not served to alter attentional bias to negative information, then typically they have exerted no impact on anxiety reactivity or dysfunction (e.g., Maoz et al., 2013; Boettcher et al., 2012; Carlbring et al., 2012). This observation provides reassurance that it is change in attentional bias, rather than other aspects of the delivered procedures, that drives change in anxiety reactivity and dysfunction, further strengthening the evidence that attentional bias to negative information causally contributes to the regulation of anxiety. Confusion has been invited by the conclusion drawn in several meta-analyses that the impact of ABM on anxiety has been inconsistent across studies (e.g., Cristea et al., 2015; Hallion & Ruscio, 2011; Price et al., 2016). This confusion has been largely due to the fact that these meta-analyses have used the term *ABM* to describe procedures intended to modify attentional bias, without distinguishing between studies in which these procedures have, and have not, successfully evoked this intended ABM process. Clearly, this distinction is of critical importance when seeking to determine whether modifying attentional bias to negative information serves to alter anxiety vulnerability and dysfunction, which is the question under present consideration. Therefore, Grafton et al. (2017) reanalyzed the results of Cristea et al. (2015), but subdivided the studies in terms of whether or not the procedure adopted and, with the intention of modifying attentional bias successfully, evoked this ABM process as intended. The results revealed that, in the former subset of studies, there was a significant change in anxious symptoms, whereas in the latter subset there was no trace of any such impact on anxiety.

Thus, while it remains to be seen whether attentional bias to negative information causally contributes to the etiology and/or maintenance of anxiety disorders, there is good evidence that when attention bias to negative information is successfully reduced by ABM procedures, this serves to attenuate anxiety reactivity and dysfunction. Such findings support the hypothesis that this attentional bias can make a causal contribution to the regulation of anxiety. We now briefly consider the applied implication of these findings, and suggest potential future research avenues that may enhance the benefits of the ABM approach.

Applied Implications and Future Research Directions

The potential therapeutic benefits of ABM will likely be optimized if change in attentional bias is enduring. ABM studies have typically not involved long-term assessment

of attentional bias, and so the longevity of such change largely remains unknown. We recommend that future researchers routinely include follow-up assessment of attentional bias to determine the robustness (or fragility) of ABM-induced bias change. Of course, bias change must be achieved in the first place and so, unsurprisingly, there has been much effort to develop procedures that can more consistently elicit the ABM process. One line of research has sought to optimize the way previously employed procedures are delivered. For example, investigators have adapted existing protocols by introducing verbal instruction (e.g., Grafton et al., 2014), neural stimulation (e.g., Heeren et al., 2017), or neural feedback (e.g., Mennen et al., 2021). While these research efforts often have yielded encouraging findings, they have been constrained by their continued reliance on existing procedures, such as the adapted version of the conventional attentional probe task introduced over two decades ago with the aim of modifying attentional bias. There is little reason to suppose that the procedures employed in the earliest attempts to modify selective attention will prove to be the most effective methods of modifying attention across future years, even when new delivery protocols are adopted.

Other researchers have sought to develop new procedures, capable of more effectively modifying attentional bias. For example, some recently developed procedures make use of virtual reality technology (e.g., Ma et al., 2019), whereas some are designed to increase participant engagement through the use of complex and dynamic stimulus displays (e.g., Notebaert et al., 2018), or by incorporating other elements of gamification (e.g., Dennis & O'Toole, 2014). There is growing evidence that these new procedures may be more effective in successfully eliciting the ABM process, which will be critical if the potential real-world benefits of ABM are to be harnessed.

The applied benefits of the new procedures designed to more effectively elicit the ABM process will likely be further enhanced if they serve to change attentional bias to real-world relevant negative information that drives elevated anxiety in naturalistic settings. We suggest that could potentially be accomplished by extending, into the ABM field, the recent innovation of employing video-based stimulus information, made possible by the dual probe approach. Not only is such information more ecologically valid than single words or static images but this richer type of stimulus information can be constructed such that its content tightly aligns with the specific concerns of the cohorts under study, permitting ABM studies to target attentional bias to the specific types of negative information that drive their worry in the real world. By developing training variants of the dual probe approach, designed to reduce attentional bias to such ecologically relevant negative information, the potential applied benefits of ABM may be optimized. Also, the resulting capacity to target attentional bias to more precise and specific informational content will permit future researchers to test ever more precise hypotheses concerning the attentional basis of elevated anxiety vulnerability and dysfunction, thereby continuously advancing understanding while also progressively enhancing the real-world benefits of ABM.

Concluding Remarks

The research reviewed in this chapter has established that attentional bias to negative information causally contributes to the regulation of anxiety. The successful elicitation of the ABM process has been shown to produce significant changes in anxiety reactivity and dysfunction, and when this bias is successfully reduced, then anxiety vulnerability and dysfunction is commonly attenuated. As we have noted, however, procedures

employed with the aim of eliciting this ABM process have not always produced this intended change in attentional bias. Hence, we encourage ongoing research efforts to optimize the effectiveness of these intended attentional training procedures, such that they more consistently achieve the goal of modifying attentional bias to negative information. We also suggest extending future ABM research to enable modification of attention bias to the more complex types of negative information that drive elevated anxiety in naturalistic contexts, perhaps through the use of enriched video-based stimulus materials. Such future research may further illuminate the ways in which biased attention to negative information contributes to the regulation of anxiety within real-world settings, while also ensuring that the early promise of ABM approaches to the effective attenuation of anxiety vulnerability and dysfunction comes to fruition.

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CHAPTER 53

Positive Emotion Regulation Interventions for People Coping with Significant Life Stress

JUDITH TEDLIE MOSKOWITZ

In the early 1990s, researchers conducting a study of stress and coping in men caring for their partners with AIDS found that even though the caregivers were highly distressed, they also reported frequent experiences of positive emotion (Folkman, 1997). How could this be? The caregivers were facing some of the most significant stress humans experience—providing care for a loved one with a terminal illness—and the high levels of negative emotions, like fear, sadness, and grief, were expected in such circumstances—however, the men also reported positive emotions, like satisfaction, relief, and happiness, and asked the researchers to add questions to the interview about the positive events that were happening in their lives, as well. Qualitative interviews revealed that the caregivers were intentionally looking for and savoring these positive experiences; they remarked on events such as a beautiful sunrise or cooking a meal that their partner was able to enjoy (Folkman et al., 1997).

Researchers had theorized about the potential adaptive functions of positive emotion in coping with stress, such as providing a momentary break from the ongoing stress, serving as a psychological resource to help buffer the negative effects of stress, and rebuilding those personal resources that get depleted with chronic stress (Lazarus et al., 1980). But it wasn't until decades later that the empirical evidence for the unique benefits of positive emotion became clear (Fredrickson, 1998) and studies began to accumulate that demonstrated the beneficial impact of positive emotion, independent of the effects of negative emotion, across social, interpersonal, mental health, physical health, and other important life domains (Lyubomirsky et al., 2005).

Notably, the caregivers weren't simply passively waiting for positive emotions to occur but intentionally seeking out and creating positive events, then savoring them as

a way of coping with the stress of caregiving. Although they were certainly employing numerous coping strategies in an attempt to reduce the high levels of negative emotion, they were also employing strategies that helped to create and maintain their positive emotions. In other words, they were engaging in positive emotion regulation.

In the present chapter, I provide an overview of interventions that specifically aim to improve positive emotion regulation, starting with a definition of positive emotion regulation; I note recent meta-analytic evidence that these positive emotion regulation interventions (sometimes called positive psychological interventions [PPIs]) improve emotional well-being, describe a positive emotion regulation intervention that our team developed, and briefly review trials of this intervention across samples and delivery formats. I conclude with suggestions for future work in the area of positive emotion regulation interventions.

Positive Emotion Regulation

Emotion regulation has been defined as “attempts individuals make to influence which emotions they have, when they have them, and how these emotions are experienced and expressed” (Gross et al., 2006, p. 14). Although the bulk of research in this area has focused on regulation of negative emotions, studies have increasingly turned to positive emotion regulation and demonstrated its importance independent of negative emotion regulation efforts (Colombo et al., 2021). For example, Fredrickson et al. (2003) demonstrated that resilient individuals were less likely to experience depression in the aftermath of 9/11 and that the experience of positive emotions mediated this effect. This work suggests that strategies for up-regulating positive emotion, especially in the context of stressful life experiences, may help to maintain psychological well-being.

Can a Focus on Increasing or Up-Regulating Positive Emotion Improve Emotional Well-Being?

The evidence that positive emotion is uniquely beneficial across a number of important life outcomes led to the development of PPIs that specifically target positive emotion regulation (e.g., Schueller et al., 2014). This contrasts with programs that explicitly focus on reducing negative emotions or fixing dysfunctional behaviors or thoughts. Simply having emotional well-being as an outcome measure is not sufficient for a program to fit the definition of a PPI. In recent years, the literature on PPIs has grown rapidly—however, it remains challenging to determine which emotion regulation strategies work best for regulating positive emotion, through which mechanisms, and for which populations. In the most comprehensive meta-analysis of PPIs to date that included 347 studies, Carr and colleagues (2020) examined the effects of PPIs on a variety of psychological outcomes, including well-being, strengths, quality of life, depression, anxiety, and stress. Although relatively few studies included a measure of positive emotion specifically, when it was noted as an outcome, it was grouped in the broader category of well-being that also contained scales of general well-being, job-related well-being, life satisfaction, and overall happiness, among others.

Results of the meta-analysis indicate small to moderate effects of PPIs on outcomes in this broad category of well-being. It is notable that there were a number of significant moderators of the effects of PPIs on well-being, including strength of the control

condition (stronger effects of treatment as usual vs. active or attention-matched controls), type of strategies taught (multicomponent more effective than single skill), and life stage (strongest effects in older adults), among others (Carr et al., 2020).

A Multicomponent Positive Emotion Regulation Intervention

Theoretical Foundation

Our team has developed and tested a multicomponent PPI that consists of a number of activities shown to increase positive emotion (see Table 53.1). The goal was to include an array of possible strategies so that individuals could choose the ones that worked best for them and use them habitually, rather than a one-size-fits-all approach that will inevitably fail if the individual doesn't take to it. Based on the broaden-and-build theory (Fredrickson, 1998) and revised stress-and-coping theory (Folkman, 1997), we proposed the positive pathways to health theoretical model (Moskowitz et al., 2019; see Figure 53.1), which posits increased positive emotion as the primary mechanism through which PPIs improve physical and psychological health.

Specifically, our theoretical model hypothesizes that engaging in the positive activities in PPIs increases the frequency of positive emotion that, in turn, has a range of proximal effects, such as providing a timeout from stress (Lazarus et al., 1980), prompting more adaptive coping strategies (Folkman, 1997), broadened attention and cognition and increased behavioral action tendencies (Fredrickson, 1998), reduced emotional reactivity to daily stress, and strengthened social relationships, which all lead to reduced stress. In turn, this reduction in stress predicts better physiological functioning (e.g., quicker autonomic recovery after a stressful event) and greater engagement in preventive health behaviors, which ultimately lead to improved physical and psychological well-being (e.g., less depression and anxiety; more life satisfaction, meaning, and purpose). The effects flowing from increased positive emotion—proximal effects, reduced stress, improved physiological function and health behaviors—are hypothesized mediators of the effects of PPIs on physical health. Individual characteristics, such as type of stress (e.g., caregiving stress, coping with the diagnosis of a chronic illness, daily hassles), baseline levels of depression and well-being, sociodemographic characteristics, and dispositional or personality factors, constitute one class of potential moderators. Other potential moderators include dosage and frequency of activities, the particular positive activity, match to individual, and delivery mode (e.g., online self-guided, in person; see Carr et al., 2020).

Results

The multicomponent positive emotion regulation PPI developed by our team and described in Table 53.1 has been tested in a number of samples experiencing different types of life stress using a variety of delivery formats. We started with in-person individually delivered sessions for people newly diagnosed with HIV (Moskowitz et al., 2017), and expanded to classroom group delivery for high school students (Kamsickas et al., 2023), web conference delivery for dementia caregivers (Moskowitz et al., 2019), and online self-guided delivery for people with elevated depression (Moskowitz et al., 2023), among others. With each iteration of the intervention, we tailor it for the specific sample, but the core positive emotion regulation strategies remain consistent throughout.

As hypothesized, in many of our studies, participants who were assigned to learn the positive emotion regulation skills reported increased positive emotion compared to

TABLE 53.1. Skills Included in the Multicomponent Positive Emotion Regulation Intervention

Skill	Rationale
Noticing positive events	A number of studies demonstrate that positive life events are associated with increases in positive affect (Zautra & Reich, 1983). Even seemingly minor daily positive events can have a beneficial impact on well-being (Panaite et al., 2021).
Savoring	<i>Savoring</i> involves an expressive response to positive events that includes telling others about it, marking the occurrence in some way, or even simply thinking about the event again later on (Bryant & Veroff, 2017).
Gratitude	<i>Gratitude</i> is defined as a feeling of thankfulness and appreciation expressed toward others, including other people, nature, or a higher spiritual power. The association between intentionally noting things for which one is grateful and increased well-being is well supported empirically. Studies on gratitude across a range of participant samples have demonstrated that practices such as keeping a gratitude journal are associated with improvements in emotional well-being (Cregg & Cheavens, 2021).
Mindful awareness	<i>Mindfulness</i> is defined as the ability to intentionally pay attention to and maintain nonjudgmental awareness of one's experience (thoughts, feelings, physical sensations) in the present moment (Kabat-Zinn, 2003). In our PPI, we focus specifically on the attention/awareness and nonjudgment components of mindfulness.
Positive reappraisal	The extent to which an event is experienced as stressful depends on the individual's appraisal: the interpretation of the significance of the event for their well-being. <i>Positive</i> reappraisal is a form of coping in which the significance of the event is reinterpreted in a more positive way. For example, seeing the "silver lining" or something good in a stressful event is one form of positive reappraisal. In the coping literature, positive reappraisal is one of the few ways of coping that is consistently associated with increased positive emotion (Folkman, 1997). Even brief reappraisal activities are effective for increasing positive and decreasing negative emotion (Rompilla et al., 2021).
Personal strengths	Focusing on one's strengths is a form of self-affirmation that is sometimes used as a positive emotion manipulation in laboratory studies and focusing on personal strengths is associated with increased positive emotion (Quinlan et al., 2019). In several versions of our PPI, we link the focus on personal strengths with the setting of attainable goals. If goals align with personal strengths and resources, they are more likely to be attainable.
Attainable goals	Planning and setting goals and perceptions of progress toward those goals are associated with greater life satisfaction and higher levels of positive emotion (Carver & Scheier, 1990). A focus of this lesson is on creating goals so that they are challenging enough to result in positive emotion when progress is made but not so challenging that they are not achievable.
Acts of kindness	Meta-analyses indicate that acts of kindness are associated with increased positive emotion, as well as improvements in other aspects of well-being (Curry et al., 2018). Engaging in acts of kindness may be an effective emotion regulation strategy because it distracts one from their own problems, increases self-esteem, or increases a sense of control or efficacy.
Self-compassion	<i>Self-compassion</i> involves regarding oneself with kindness and nonjudgment, especially in times of suffering (Ferrari et al., 2019). Although self-compassion was not included as a separate skill in the early iterations of our PPI, we added explicit self-compassion content as it became clear that many of our stressed samples were particularly hard on themselves. There was a need for participants to be less critical of themselves and this self-compassion made it easier for participants to engage with the other skills in the program.

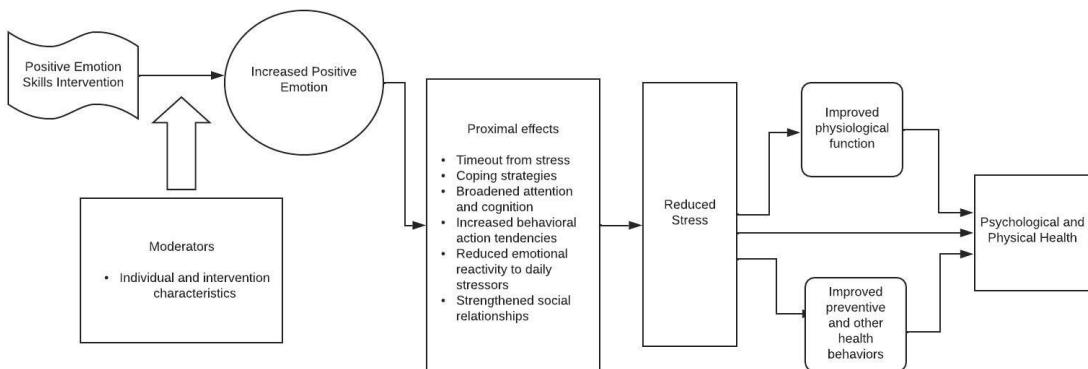


FIGURE 53.1. Positive pathways to health theoretical model with hypothesized pathways linking positive psychological interventions (PPIs) to psychological and physical health. From Moskowitz, Addington, et al. (2019). Copyright © 2019 Elsevier. Reprinted with permission.

Measurement

An area that merits increased attention is the measurement of use of the skills taught in the PPI. In randomized controlled trials, we assume that differences between the intervention and control groups is that the intervention group is using the skills and not that they are simply being exposed to them. Although we can see participants' completed home practices if they enter them in the paper or virtual logs, we have not yet observed their use of the emotion regulation strategies in their day-to-day lives. In addition, the measurement of use of the skills does not extend beyond the end of the intervention period so we don't know about durability of skill uptake. Future work should include daily diary or other assessment approaches that can pick up behavioral responses in daily life (e.g., ecological momentary assessment). For example, a recent daily diary study assessed emotion regulation strategies and found that lower positive emotion on one day led to increased use of positive emotion regulation strategies and higher subsequent positive emotion (Colombo et al., 2021).

Another area of focus for positive emotion regulation interventions is the measurement of emotions themselves. Even though most studies rely on self-report, there is little consistency on which measures are used (Moskowitz et al., 2021). One explanation for the variable effects of PPIs on positive emotion is the wide variety of ways that emotion has been operationalized and measured that may be more or less sensitive to the intervention. For example, in one study we found significant effects on past-day positive emotion as assessed with the day reconstruction method (Kahneman et al., 2004) but no effect using the same emotion items assessed retrospectively over the past week (Moskowitz et al., 2017). There is a call in the broader literature on emotional well-being to have researchers come to a consensus on a consistent set of measures of emotion to begin to address this question (Kubzansky et al., 2023).

Mediation

Consistent with other theoretical models of the adaptive functions of positive emotion (Folkman, 1997; Fredrickson, 1998), our theoretical model posits that the skills taught in our PPI lead to increased positive emotion that, in turn, improves downstream psychological well-being (Moskowitz, Cheung, et al., 2019)—however, with a few notable

exceptions (Fredrickson et al., 2008; Moskowitz, Addington, et al., 2019) few studies have explicitly examined mediational pathways of PPIs. We recently explored multiple operationalizations of both positive and negative emotion as possible mediators of the PPI effect on depression and found that the intervention both increased positive emotion and decreased negative emotion. Contrary to hypotheses, however, only negative emotion mediated the impact of the intervention on depressive mood. Positive emotion did not (Moskowitz et al., 2023). This may be a function of the sample (adults with elevated depressive symptoms), the delivery mode (online self-guided delivery), or other confounders that weren't measured in the study. Furthermore, the lack of support for positive emotion as the mediator in PPIs may indicate that the interventions are "working" through other mechanisms, such as positive behaviors or cognitions (Lyubomirsky & Layous, 2013).

Implementation

Finally, there is now sufficient evidence from our work and others that PPIs increase positive emotion when the program is delivered in such a way that the target audience finds the program acceptable, understandable, and easy to incorporate into their daily lives. Although there is still much work to be done to discern the optimal delivery mode and outcome measurements, it is also important to move toward implementing the program in clinical and other settings where patients, clients, and other individuals might directly benefit from the program. Ultimately, broader implementation of PPIs has the potential to improve well-being on a societal level. Our team has begun conducting hybrid trials that focus on both effectiveness and implementation to help maximize the potential beneficial impact of delivering these positive emotion regulation skills to a wide range of recipients (Stump et al., 2022).

Conclusions

The risk of proclaiming the importance of positive emotion and positive emotion regulation in the stress and coping process is that it may appear to minimize the pain and serious individual and society consequences associated with chronic stress. We are not advocating a simplistic "don't-worry-be-happy" approach. Such a naïve stance could easily degenerate into blaming the stressed individual for not thinking the positive thoughts that prevent depression and other negative consequences of enduring stress. Furthermore, it is important to note that more is not always better when it comes to positive emotion (Feng et al., 2022) and there are definite downsides to the pursuit of more positive emotion (Gruber et al., 2011). Rather, our point is that the human response to stress is very complex and can include positive emotional responses, as well as negative. Therefore, this area of research strives to expand the traditional negative emotion-only focus to include appreciation of the potential adaptive consequences for positive emotion regulation, as well.

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CHAPTER 54

Single-Session Interventions

OPTIMIZING IMPACT THROUGH THE EXTENDED PROCESS MODEL OF EMOTION REGULATION

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Successful emotion regulation is fundamental to mental health across the lifespan (Fernandez et al., 2016; Sheppes et al., 2015). Conversely, failure to successfully regulate emotions, or emotion dysregulation, has been identified as a transdiagnostic contributor to the onset and maintenance of psychopathology (Fernandez et al., 2016; Sheppes et al., 2015), propelling broad interest in emotion regulation-focused mental health interventions (Kring & Sloan, 2009). Psychotherapies designed to increase adaptive emotion regulation have reduced diverse forms of psychopathology, suggesting these skills as impactful intervention targets (Barlow et al., 2020; Carlucci et al., 2021).

However, identifying emotion regulation as a promising treatment target has yet to yield increased *access* to evidence-based, emotion regulation-focused interventions. Despite progress in identifying effective treatments, up to 80% of youth and 60% of adults with mental health needs never access care (Kazdin & Rabbitt, 2013; Konrad et al., 2009). Moreover, existing evidence-based interventions targeting emotion regulation may be prohibitively difficult to disseminate: they are often costly in time and money, lengthy, and designed for delivery by highly trained professionals, limiting access for large swaths of the population (Kazdin, 2019). Thus, although emotion regulation-focused treatments should arguably be prioritized for broad dissemination, few are easily accessible, highlighting a need for novel approaches to increasing their scalability in the long term.

Single-session interventions (SSIs) for mental health problems present an exciting opportunity to improve rapid, flexible access to evidence-based support. SSIs are defined as “structured programs that intentionally involve only one visit or encounter with a clinic, provider, or program; they may serve as stand-alone or adjunctive clinical services” (Schleider, Dobias, Sung, & Mullarkey, 2020, p. 265). Importantly, SSIs are designed for

a “one-at-a-time” approach to intervention: Although they may be completed on multiple occasions, they are designed such that *any individual session* can stand on its own, with the potential to yield positive change (Schleider, Dobias, Sung, Mumper, et al., 2020). SSIs can take multiple forms (provider delivered, self-guided)—however, the flexible nature of digital, self-administered SSIs allow them to be deployed in diverse settings and at moments of perceived need; as such, digital SSIs are the primary focus in this chapter.

The SSI literature has yet to be situated within formal emotion regulation frameworks—however, several digital SSIs explicitly teach emotion regulation strategies (e.g., Schleider et al., 2022) and consistently reduce emotional symptoms and disorders, even when delivered as stand-alone supports, across follow-ups of 3–9 months (Dobias et al., 2021; Schleider & Weisz, 2017; Schleider, Dobias, Sung, Mumper, et al., 2020; Sung et al., 2021). As one recent example, in a randomized trial including 2,452 U.S. adolescents with elevated depressive symptoms, two digital, self-guided SSIs (one teaching behavioral activation, the other teaching that personal characteristics are malleable) significantly reduced 3-month depressive symptoms, hopelessness, and restrictive eating versus a supportive control (Schleider, Dobias, Sung, Mumper, et al., 2022). In another randomized, placebo-controlled trial of 555 adolescents endorsing self-injurious behaviors, a digital, self-guided SSI reduced self-hatred and increased desires to stop future self-injury (Dobias et al., 2021). In both trials, participants completed digital SSIs during the COVID-19 pandemic (May–December of 2020) on personal internet-equipped devices, when and where they preferred. Thus, SSIs show clinical utility, even when provided in high-stress, real-world contexts.

In this chapter, I argue that two typically siloed areas of research—SSIs and emotion regulation—stand to catalyze each other’s impacts. Specifically, I describe how the extended process model (EPM) may offer a road map for *optimizing the content* of mental health SSIs and *strategic implementation of SSIs* in best-fit contexts. Below, I briefly overview the EPM, describe how it may usefully inform SSI content and implementation, and propose future research opportunities, aimed at harnessing digital SSIs to strengthen population-level emotional health.

The EPM of Emotion Regulation

Gross’s (2015) EPM specifies both the *families* of emotion regulation strategies and *how* emotion regulation efforts unfold in real time. There are five general types of strategies that individuals might use to influence emotional experience, classified by when they are deployed in the emotion-generating process: (1) situation selection (influencing exposure to situations that could generate certain emotions), (2) situation modification (altering a situation to modify its emotional impact), (3) attentional deployment (selectively allocating attention to alter an emotional response), (4) cognitive change (changing the evaluation of a situation to influence its emotional impact), and (5) response modulation (pursuing an action to shape one’s emotion). Importantly, considerable within- and between-family variability exists across strategies, and any strategy may be adaptive or maladaptive depending on where, when, and how it is deployed (Gross, 2015)—however, teaching certain strategies within these families, along with how and when to appropriately deploy them, can help individuals manage distressing emotions and mitigate psychopathology over time.

The EPM also conceptualizes *how* emotion regulation occurs in real time, positing that emotion regulation occurs via four interconnected stages. Specifically, it suggests

that individuals (1) identify which emotions may require regulating; (2) select an emotion regulation strategy (within the five families noted above); (3) implement the selected strategy; and (4) monitor whether modification to that strategy is necessary, based on both its initial success and changing contexts.

Implications for SSI Design and Delivery

The EMP outlines *what* emotion regulation strategies one might deploy and *how* efforts to deploy them occur over time. Several existing psychotherapies can successfully teach people *what* strategies to deploy in different emotionally challenging contexts (Barlow et al., 2020)—however, early dropout from these multisession therapies is exceptionally common, such that if emotion regulation skills are taught starting in Session 4, they fail to benefit the many clients (up to 25%) who discontinue before Session 3 (Abel et al., 2022). Second, existing psychotherapies are asynchronous treatments: once-weekly sessions occur outside the moments of emotional distress, limiting their capacity to lend in-the-moment, stage-specific emotion regulation support. By contrast, digital SSIs are barrier-free and easily completable, eliminating challenges of premature treatment drop-out; they are also accessible whenever and wherever they are needed. Thus, they hold the potential to deliver key, discrete components of multisession interventions while the relevant stage of emotion regulation is underway (i.e., immediately after identifying an unhelpful emotion). The EMP may serve as a guide for *optimizing the potency and precision of SSIs*, allowing them to meet their potential as tools for public mental health. Specifically, the EMP can suggest best-bet *strategies* for SSIs to target and guide *when and how* those SSIs may be most usefully offered to people in the contexts of their everyday emotions.

Below, I discuss SSIs that target strategies within two of the five families of emotion regulation strategies: cognitive change and response modulation. Moving forward, other SSIs might be developed to explicitly target other strategies; the following is meant to provide a starting point for using the EPM to understand and study the content and real-world implementation of digital SSIs.

The EMP Suggests Strategies for SSIs to Target

Although they have not been described as “emotion regulation interventions,” several evidence-based, digital SSIs would be well characterized by precisely this phrase. At least four existing SSIs are designed to teach a specific strategy within the five-family framework (e.g., cognitive change: Dobias et al., 2021; Schleider & Weisz, 2018; response modulation: Schleider, Dobias, Sung, Mumper, et al., 2022; Sung et al., 2021). Effective digital SSIs also aim to help users identify *contexts* when that strategy may (or may not) be helpful, using testimonials and stories from others experiencing similar, relevant challenges. These SSIs also embed strategy rehearsal to enhance mastery, such as “saying-is-believing” writing exercises that require users to perspective shift (a strategy within the “cognitive change” family) to teach others to apply their newly learned skill. Several SSIs also help users craft an action plan, lending personalized support for future, context-appropriate strategy implementation.

One such example is the Action Brings Change (ABC) Project, a 20- to 30-minute, self-guided digital program based on principles of behavioral activation, an evidence-based

approach to treating depression. The ABC Project was specifically designed for adolescents experiencing depression symptoms; the program encourages users to “take action” in moments of sadness and amotivation by engaging in pleasurable, values-aligned activities (Schleider, Dobias, Sung, Mumper, et al., 2020), and it has significantly reduced depressive symptoms in high-symptom teens relative to active, placebo controls (Schleider et al., 2020; Schleider, Dobias, Sung, Mumper, et al., 2022). The intervention contains five components: (1) psychoeducation describing how taking values-based actions can boost mood, particularly in moments of low motivation or distress; (2) a values assessment, where individuals identify a personal “top value” (e.g., academics, friendships, hobbies, family, staying active); (3) constructing an “action plan,” wherein users are guided to build a plan for engaging in specific meaningful activities, at specific times and in response to specific negative emotions, in the area identified as their “top value”; (4) an activity that guides users to identify a “coping thought” to use if and when they experience a “roadblock” (a thought or feeling that prevents them from using their action plan); and (5) a saying-is-believing activity, where users advise a peer on how to “take action” when facing their own depression-related difficulties.

Viewed through an EPM lens, the ABC Project teaches users where, when, and how to implement a response modulation strategy, within domains that matter to them (per their chosen “top value”) and in specific, challenging emotional contexts (when experiencing symptoms of depression). ABC Project users also rehearse *cognitive change* strategies by identifying a “coping thought” to help them manage emotional roadblocks (reappraisal), and by teaching a peer to “take action” to manage his or her own emotional distress (perspective shifting). Likewise, the ABC Project may help individuals navigate all four stages within the EPM, by helping them identify emotions requiring modification (here, depressive symptoms like anhedonia); teaching them an evidence-based strategy to select; supporting strategy implementation through a values-based action plan; and scaffolding response monitoring, by orienting them to potential future roadblocks and “coping thoughts” to overcome them. Overall, viewing the ABC Project within the EPM framework helps clarify which emotion-regulatory mechanisms the program might operate. It also elucidates the stages of emotion regulation during which the SSI may be most beneficial; for the ABC Project, best-fit stages may be at *strategy selection* and *implementation* given the psychoeducation and action-planning supports it provides. The EPM also offers a framework for parsing strengths and gaps in the broader SSI literature: Which strategies can existing SSIs successfully target? During which stages of emotion regulation can they lend support? Using the EPM to answer these and related questions may reveal the need for future SSI development and research.

The EPM Can Guide When and How to Deliver SSIs

From a population-level mental health perspective, digital SSIs carry an important advantage over multisession, therapist-delivered interventions: Many are freely accessible by anyone, at any time, with access to an internet-equipped device. Indeed, our team evaluated and now maintains open-access websites allowing anyone to freely, anonymously access three evidence-based SSIs for adolescents (www.schleiderlab.org/YES; Schleider, Dobias, Sung, Mumper, et al., 2020) and one for caregivers (www.schleiderlab.org/EMPOWER; Sung et al., 2021). Thus, a natural next step for SSI research involves the strategic deployment of SSIs at precise moments of need. The EPM may provide a framework for deploying and testing “just-in-time” SSI delivery approaches, centered around

moments of emotion identification, strategy selection, strategy implementation, or maintenance efforts.

To date, only one study has investigated this approach. In work facilitated by our lab's research partnership with Koko, a nonprofit, online mental health platform, we evaluated the feasibility and utility of offering "in-the-moment" digital SSIs to social media users (Dobias et al., 2022). Three digital SSIs were adapted and embedded within Tumblr, a popular social media platform with >130 million monthly users. Users searching for distress-related topics (e.g., "anxiety," "depressed," "find therapy") received a direct message including links to SSIs. Each digital SSI (ABC Project: Schleider, Dobias, Sung, Mumper, et al., 2020; Project SAVE: Dobias et al., 2022; REFRAME: Dobias et al., 2022) was presented to users as teaching a specific emotion regulation or coping strategy (adaptive activity selection in ABC, perspective shifting in SAVE, reappraisal in REFRAME). Among those who completed an SSI ($N = 6,197$ across 11 months), improvements emerged across all clinically relevant outcomes (hopelessness, self-hate, desire to stop self-harm; $p < .0001$) from pre- to post-SI, suggesting the promise of delivering SSI to individuals' in-the-moment needs and distress—here, immediately following the "identification" stage of emotion regulation.

Outstanding Questions toward "Just-in-Time" EPM-Guided SSIs

Myriad questions remain regarding the feasibility and effectiveness of offering SSIs as just-in-time supports at specific EPM stages. In the case of digital, self-guided SSIs, passive sensing of smartphone data may create opportunities for testing these questions directly. Passive sensing involves analyzing vast amounts of automatically collected data (e.g., from accelerometers, heart rate sensors, or a global positioning system [GPS] embedded in one's smartphone), which may be modeled to estimate one's emotional states and proximity to potentially distressing contexts. To date, passive sensing data have been used to successfully identify moments of loneliness and social isolation (Qirtas et al., 2022), as well as positive and negative mood states (Sükei et al., 2021). Certainly, passive sensing models must be carefully adapted for specific populations and goals, and accurate measurement of momentary context warrants continued refinement—however, these methods suggest several possibilities for just-in-time SSI delivery. For individuals who struggle to *identify* emotion regulation needs, perhaps SSIs could be offered to individuals when passively collected data detect elevations in their anxiety or loneliness, prompting individuals to consider whether emotion regulation might be helpful. To aid strategy *selection*, users experiencing distress may be presented with two to three potentially relevant SSIs to choose from, teaching different adaptive strategies. Based on their chosen SSI's effectiveness (which is measurable via brief pre- and post-SI assessments), users may receive notifications when experiencing similar emotions in the future, reminding them of the previously helpful strategy and presenting their existing SSI action plan. Likewise, notifications might facilitate implementation and monitoring success by alerting individuals when alternative strategies might be needed (e.g., when an initially chosen SSI fails to yield passively detected improvements in mood). These possibilities have yet to be evaluated, and their success will inevitably vary by the precision and flexibility of methods for extracting emotions and contexts from passively collected data. Nonetheless, they represent potentially impactful ways to integrate emotion regulation theory and research into the targeted implementation of SSIs for mental health.

Conclusions and Future Opportunities

This chapter introduces the promise of studying SSIs through the lens of the EPM of emotion regulation. Indeed, the EPM may offer a practical road map for examining specific emotion regulatory strategies as mechanisms of change within SSIs, as well as for the strategic pursuit of just-in-time SSI implementation, precisely in the moments and contexts where emotion regulation support is needed most. This approach suggests a variety of potentially impactful next steps for research, including formal tests of (1) which adaptive emotion regulation strategies SSIs are most (at least) helpful in modifying (2) the specificity (or lack thereof) of different SSIs' impacts on different emotion regulation strategies, (3) the stages of emotion regulation at which digital SSI deployment is most acceptable and valuable to people with mental health needs, and (4) integration of just-in-time SSI delivery with passive assessments of emotions and contexts. Answering these questions may help realize the promise of SSIs to strengthen emotional health at scale.

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CHAPTER 55

Digital Mental Health Interventions

ANDREA NILES

Empirically based treatments exist for many psychiatric disorders (Butler et al., 2006), but as many as 80% of the people in the United States who need treatment do not receive it (Kohn et al., 2004). Although one-on-one therapy predominates as the default treatment approach in mental health care, this approach cannot address the widespread need due to limited availability of trained providers, cost, and stigma (Kazdin & Rabbitt, 2013).

In this chapter, I first discuss the promise of digital interventions to address the widespread need for empirically supported mental health interventions. Second, I review challenges of using digital interventions to meet this demand. Finally, I present some potential solutions to these challenges to guide future work in digital mental health interventions.

The Promise of Digital Mental Health

The delivery of mental health treatment using technology holds great potential to address many of the challenges with treatment access. As of 2019, according to research done by the Pew Research Center, 81% of people in the United States have access to a smartphone with this number continuing to rise. As a result, programs available via smartphones can be easily accessible to the majority of people in the United States. Further, programs with minimal or no provider support can be scaled at very low cost, resulting in considerable price reductions for users. Finally, if people can access treatment from the privacy and comfort of home, this may reduce barriers like stigma and time limitations.

Challenges for Digital Mental Health

Although digital interventions show great promise, there are significant challenges to developing effective and engaging programs. First, for in-person therapies, the therapist

plays a critical role by developing a therapeutic relationship. Indeed, fully self-guided interventions have poorer effectiveness and retention compared to programs that include human support (Hedman et al., 2012; Johansson & Andersson, 2012; Palmqvist et al., 2007; Spek et al., 2007). Most self-guided programs do not incorporate any elements of the therapeutic relationship, which may partially explain these findings.

A second limitation to existing digital interventions is that they generally adopt evidence-based treatment models that use a “session” approach where the therapist delivers the intervention in hour-long weekly sessions. This approach is appropriate for in-person treatment when the therapist has a specified time to meet with the patient to deliver an intervention—however, it has carried over to digital interventions where this model no longer fits with the medium of delivery because it fails to capitalize on the ability for technology to deliver interventions right at the moment of a patient’s need. The predominance of the session-based approach in digital interventions may also be limiting both effectiveness and engagement.

Third, self-guided programs generally either deliver the same treatment elements in the same order to all users, or require the users to choose the elements with which to engage. The former assumes that all users will benefit from the same skills delivered in the same order, which is unlikely, and the latter requires the user to have sufficient knowledge and insight to select an appropriate intervention, which may be the case only for a small subset of users. Thus, a lack of personalization in unguided programs may also explain reduced effectiveness compared to guided programs.

Potential Solutions

I propose three updates to existing digital intervention approaches that have the potential to overcome some of the challenges outlined above: (1) a conversational interface to support development of a therapeutic relationship, (2) inclusion of just-in-time (JIT) interventions to allow on-demand delivery, and (3) adaptation and personalization to address and match interventions to the unique needs of each individual user. In the sections below, I describe each of these elements and why they could enhance engagement and effectiveness for digital interventions.

Conversational Interface

Combining fully automated treatment delivery with a conversational interface could resolve some of the issues that limit outcomes for unguided treatments. Although unguided programs can reach a large number of people, users engage with these programs in an entirely different setting than traditional in-person therapy—namely, in their daily lives where attention can be split between competing demands. Digital mental health interventions with therapist support have better outcomes compared to those with no therapist support (Hedman et al., 2012; Johansson & Andersson, 2012; Palmqvist et al., 2007; Spek et al., 2007), and mobile app engagement with unguided programs is low (Moyers & Miller, 2013). One hypothesis for these poorer outcomes is that programs with no guidance are lacking key features that enhance in-person treatment effects, such as the therapeutic alliance and empathy. These features have been called “common factors,” as they are common to all in-person treatments regardless of treatment modality. Despite their importance in in-person treatments, common factors have generally failed to make

their way into unguided treatment programs. One solution is to use a conversational interface to bring common factors into the treatment.

A conversational interface is a user interface that emulates a human interaction. The most widely used conversational interface is text messaging with 97% of mobile phone users reporting using text messaging frequently (Smith, 2015). A chat modality allows for a back-and-forth exchange between the user and the therapeutic entity, encouraging active participation by the user as opposed to passive absorption of information. Despite the fact that the chat may be generated without any human involvement, it resembles an interaction that would typically involve another human being.

It has been argued that the therapeutic alliance is the most important common factor in therapy (Wampold, 2015). Indeed, a strong working alliance between a therapist and a patient is a robust predictor of treatment outcome and retention (Martin et al., 2000; Sharf et al., 2010). The concept of a digital working alliance between a user and a fully automated app has recently emerged in the scientific literature (Tong et al., 2022). The therapeutic alliance has three components: the bond between the provider and the patient, agreement on the goals of therapy, and agreement on the tasks of therapy (Wampold, 2015). A conversational interface can allow incorporation of specific strategies that have demonstrated efficacy to enhance engagement and motivation (Miller & Rollnick, 2012) and to establish the three components of the therapeutic relationship (bond, goals, therapy tasks). For example, via the conversational interface, the therapeutic entity can express enthusiasm about its interaction with the user, provide reinforcement for effort put forth by the user, ask about and reflect on user goals, and allow the user to guide the therapeutic interaction.

Empathy is another common factor that has consistently demonstrated correlations with treatment outcome (Elliott et al., 2018; Miller & Rollnick, 2012; Moyers & Miller, 2013). Empathy has been defined as “a specific therapeutic skill that includes a commitment to understanding the client’s personal frame of reference and the ability to convey this heard meaning back to the client via reflective listening” (Moyers & Miller, 2013, p. 2). Without a conversational interface, there is no responsiveness or reflection of users’ input, making it impossible to demonstrate empathy—however, if the user is engaged in a back-and-forth interaction, the therapeutic entity can process and reflect user inputs, which can help the user experience the entity as empathic. It’s important to emphasize that beneficial effects for treatment are a result of the *perception* of empathy by the user, which can be achieved even in the absence of true understanding by another human being. In fact, researchers have aimed to codify the factors most important to demonstrating empathy in a person-to-person conversation (Lord et al., 2015; Moyers et al., 2010), which lends itself well to delivery in a fully automated system.

JIT Intervention

A JIT intervention is one that is delivered “at the moment and in the context that the person needs it most and is most likely to be receptive” (Spruijt-Metz et al., 2015, p. 511). The JIT intervention differs significantly from existing evidence-based treatment models that use a “session” approach where the treatment is delivered in a prespecified sequence of sessions or modules. Instead, JIT treatments are delivered on demand to address the user’s immediate need.

I propose three ways the JIT approach could enhance uptake and efficacy of digital interventions compared to the session approach, elaborating on each in the sections

below. First, the JIT intervention capitalizes on moments of vulnerability and receptivity. Second, skill acquisition may be greater with a JIT compared to a session approach. Third, the JIT intervention is well matched to shifting attentional patterns for information consumption.

Moments of Vulnerability and Receptivity

Potentially the most promising aspect of treatment delivery via mobile devices is that they allow delivery of treatments during a person's greatest moments of vulnerability and receptivity. The closer in time that a skill is delivered to the moment when it is most needed, the more effective its administration may be and the more motivated a person will be to engage. Because mobile devices are "mobile" by definition, they tend to be within arm's reach at all times. This provides an opportunity to intervene in a way that has never before been available to mental health providers—namely, at the moment of need.

States of vulnerability are states of heightened susceptibility to a negative health outcome, such as unhealthy eating or heavy drinking (Nahum-Shani et al., 2015). For emotional disorders, a vulnerable state is a strong negative emotion that might trigger a maladaptive behavioral response that perpetuates anxiety and depressive symptoms and impairs functioning. If these negative health outcomes or maladaptive responses can be repeatedly prevented through administration of an intervention, the benefits will accumulate to reduce symptoms and improve functioning (Nahum-Shani et al., 2015).

These states of vulnerability may also provide an optimal state of receptivity because the desire for an effective emotion regulation strategy may be greatest when subjective distress is elevated. Research on "teachable moments" for behavior change emphasizes the importance of intervening when motivation to change is high. For example, research in readiness to change for heavy alcohol users demonstrates that intervening directly following the occurrence of alcohol-related traumatic injuries can increase the uptake of alcohol-related interventions (Gentilello et al., 1999). Thus, the importance of providing an intervention at an opportune moment could enhance the motivation of the user to engage.

Skill Acquisition

Because cognitive and behavioral therapies aim to disrupt learned patterns of thinking and behavior through psychoeducation and the practicing of unfamiliar skills (e.g., identifying distortions, thought challenging, resisting avoidance behavior), research on learning can guide us toward enhancing skill acquisition. Empirically supported strategies to promote long-term learning include spacing rather than massing practice and interleaving the content of practice. The JIT approach can effectively capitalize on both of these strategies to enhance skill acquisition.

The learning literature has consistently shown that spacing practice over multiple sessions (as opposed to massing practice during one session) can enhance long-term learning (Dempster, 1987; Glenberg, 1979; Reder & Anderson, 1982; Reynolds & Glaser, 1964). Interventions delivered through sessions typically mass skill acquisition within a session that covers a variety of topics and skills. On the other hand, JIT interventions are delivered in brief bursts guided by user need. Skills are practiced for short periods but can be separated by as little as a few minutes. Although homework assignments can increase practice spacing in a session approach, JIT interventions scaffold practice more

effectively via reminders that encourage the patient to engage in practice and by providing support during and following practice.

Further, interleaving rather than blocking practice leads to better long-term retention and recall (Brady, 2004). Blocked practice involves practicing the same skill until it is mastered, then moving to the next skill and practicing until that skill is mastered, and so on. Interleaved practice, on the other hand, involves alternating practice from one skill to another. Blocked practice results in better short-term learning and performance, whereas interleaved practice leads to better long-term learning and performance. Because the JIT intervention addresses the patient's immediate need, the skill that is delivered and practiced changes each time the user engages. This approach may result in better long-term storage and retrieval of novel skills, thereby having a longer-lasting impact on symptom reduction compared to a session approach.

Shifting Attentional Patterns

As technology and digital platforms increase the speed of communication, the amount of information competing for our attention has increased. A recent report of cell phone usage (MacKay, 2019) found that while the average amount of time users spend using their cell phones each day is 3 hours and 15 minutes, the average time devoted to any given session is 1 minute and 15 seconds with 70% lasting less than 2 minutes. Because a JIT intervention is designed to meet the user's immediate needs, it does not require sustained attention on content that may not be immediately relevant. In the session-based approach, the user must absorb all of the information delivered, identify the parts that are personally relevant, and then determine how to apply the information to their unique situation. A JIT intervention, on the other hand, can simply assess the current problem and deliver an appropriate intervention. By minimizing the attention required to process and apply an intervention, we can increase the probability that the user will engage and gain the intended benefit.

Adaptation and Personalization

Personalization and adaptation of the treatment content to the unique patient is another critical feature to enhance treatment effectiveness. Disorder phenotypes can vary dramatically even among individuals with the same diagnosis (Wright & Woods, 2020). Thus, what helps one patient may be useless to another and vice versa. Indeed, personalized sequencing of treatment modules can improve outcomes (Weisz et al., 2012). In traditional in-person therapy, the provider elicits relevant information from the patient, organizes and understands that information, and then guides the treatment process by emphasizing or minimizing interventions that are respectively more or less effective. This type of treatment personalization has not traditionally been incorporated into unguided digital interventions. Pattern recognition has the potential to serve the role of a provider by collecting and processing information from the user and guiding the treatment in a personalized way.

Pattern recognition involves a wide array of methods used to detect complex structural relationships in large datasets. To automate treatment personalization, pattern recognition methods can be used, first, to understand which interventions work for whom and in what context, and second, to select and deliver the interventions that will be most effective for an individual in a given context. Importantly, pattern recognition methods can process data from samples of millions of people and instances to identify patterns

both between and within users that would be impossible for a human to detect. Algorithms that combine insights from both between- and within-person analyses could prove highly effective at delivering an intervention that is finely tuned and personalized to the individual user. For example, different people may need different interventions at different times or for different problems, and the interventions offered can be tailored based on what was most effective for each user in past interactions.

Conclusion

Never before have we been able to deliver an intervention directly to someone in need anywhere, anytime, at a very low cost. Digital mental health interventions hold great promise for widespread dissemination of evidence-based treatments, but it is critical to develop and test new models of mental health treatment to fully capitalize on this technological opportunity. The methods described in this chapter have been put into practice in at least one commercial app, and results both for engagement and symptom reduction are promising (Mehta et al., 2021).

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CHAPTER 56

Emotion-Focused Parenting Interventions

THEORETICAL PERSPECTIVES, SUPPORTING EVIDENCE, AND FUTURE DIRECTIONS

GILLIAN ENGLAND-MASON

Parenting involves many emotional demands and emotion regulation is critical for both parenting and child development. During parenthood, emotion regulation may be best described as the parents' capacity to influence their experiences and expressions of emotions while caring for their child, and it serves a functional role in facilitating sensitive and warm parenting behaviors (Rutherford et al., 2015). Individual differences in the nature and intensity of the parents' emotions, as well as their capacity to effectively regulate these emotions, influences the quality of their parenting, the parent-child relationship, and other child developmental outcomes, such as adjustment and emotion regulation (Morris et al., 2017). Given inherent differences in parents' capacity for emotion regulation and related parenting behaviors and their importance for children's development of emotion regulation, a growing body of intervention research has focused on the design and evaluation of parenting interventions that aim to facilitate healthy emotion regulation in children and adolescents.

Parenting interventions are usually short-term programs that use standardized curricula to train parents in one or more specific area(s) in order to treat a range of child emotional and behavioral problems (Barlow et al., 2016). Traditionally, parenting interventions were based on behavior modification techniques and employed parent training to indirectly modify children's challenging behaviors (Sanders & James, 1983), but many new theoretical frameworks (e.g., attachment, emotion-focused) have been developed in the last few decades. There is a growing body of evidence supporting emotion-focused parenting interventions, which have a logical sequence of change (i.e., theory of change) that typically follows a progression from the immediate (i.e., direct) enhancement of the targeted emotion-related parenting behavior(s) to the improvement of intermediate and longer-term (i.e., indirect) outcomes, such as child emotion regulation. Many interventions

that target emotion-related parenting also target parents' emotional competence (i.e., emotion knowledge, expression, and regulation), so herein the use of "emotion-focused parenting interventions" refers to those that target emotion-related parenting, children's emotion regulation, and often parents' emotion regulation. This chapter provides a narrative overview of the theoretical perspectives, current state of the evidence, and considerations for future research on emotion-focused parenting interventions.

Theoretical Perspectives on Parenting and Emotion Regulation in Intervention Research

One seminal theory used by emotion-focused parenting interventions to describe how parents' beliefs about emotions and related parenting behaviors affect children's emotion regulation development is depicted in the work of Gottman et al. (1996). This paper introduced the concepts of *meta-emotion* and *parental meta-emotion philosophy* (PMEP). They used the term *meta-emotion* to refer to one's collection of thoughts and feelings about emotions (i.e., how one feels about feelings) and PMEP to refer to parents' organized and structured collection of thoughts and feelings about their own emotions and their child's emotions. In this work, they also contrasted an "emotion-coaching philosophy," where parents view "negative" or uncomfortable emotions (e.g., sadness, anger) in their children as valid and as an opportunity for connection and teaching, to an "emotion-dismissing philosophy," where parents view children's "negative" emotions as potentially harmful and thus to be ignored or avoided (Gottman et al., 1996). To promote optimal emotion regulation in children, many emotion-focused parenting interventions encourage parents to reflect on their beliefs about emotions based on their family of origin, consider the emotional needs of their child, and become "emotion coaches" (Havighurst et al., 2020).

Another leading theory utilized by emotion-focused interventions to describe how parenting behaviors can influence child emotion regulation is *emotion socialization theory* (EST). In the landmark paper by Eisenberg et al. (1998), they developed a heuristic model that described how characteristics of the child, parent, culture, and context predicted emotion-related parenting behaviors and set the stage for the development of social-emotional competencies (e.g., emotion regulation) in children. In brief, emotion-related parenting includes three behaviors: parents' reactions to children's emotions, discussion of emotions, and emotional expressiveness (Eisenberg et al., 1998; see Spinrad & Eisenberg, this volume, for more detail). This model has been incredibly influential, and many emotion-focused parenting interventions train parents on at least one of these emotion-related parenting behaviors. Although PMEP and EST were devised independently, they have been incorporated into the shared language that is used to describe many of the theories of change and intended targets of interventions that seek to promote children's emotion regulation (Eisenberg, 2020; Katz et al., 2020).

Overview of Emotion-Focused Parenting Interventions and Supporting Evidence

There is a lot of variation in the structure and delivery of emotion-focused parenting interventions. For example, these types of interventions can be delivered to parent groups or on a one-on-one basis, employ a range of training techniques (e.g., discussions, role plays, *in vivo* feedback), take place out of health care or community settings (e.g.,

therapists' offices, parenting centers, schools), and vary in duration (e.g., from 1 to 2 hours a week for 6–18 weeks) (England-Mason & Gonzalez, 2020). There is also considerable variation in the focus and intended targets of these parenting interventions, which is at least partially attributable to the different theory of change models. A recent review of emotion-focused parenting interventions described four domains of intervention targets. Specifically, the authors categorized interventions based on whether they were theorized to contribute to change in parents' (1) histories with emotions that have shaped their beliefs about emotions, (2) emotional competence, (3) communication and responses to children's emotions, or (4) skills related to supporting children's emotional competence (e.g., labeling emotions, teaching regulation techniques) (Havighurst et al., 2020).

Below is a selective, and by no means exhaustive, overview of common emotion-focused parenting interventions. One notable caveat is that many other parenting interventions also target emotion-related parenting as part of another framework, such as attachment (e.g., Circle of Security), mindfulness (e.g., mindfulness-based parenting), and reflective functioning/mentalization (e.g., Minding the Baby) (see Havighurst et al., 2020, for more detail) parenting programs.

Interventions in Early Childhood

Many emotion-focused interventions delivered to parents of young children target parenting behaviors related to children's recognition and understanding of emotions. Examples of universal programs for parents of young children that focus on emotion coaching include the *Tuning in to Kids* (TIK) suite of programs (e.g., *Tuning in to Toddlers*, *Dads' TIK*; see Table 56.1) (Havighurst et al., 2009). Interventions that focus on emotion coaching have also been developed for targeted populations, such as parents of children with clinical concerns. For example, there is the *Emotional Development* version of *Parent–Child Interaction Therapy* (PCIT-ED) for parents of preschool-age children with depression (Lenze et al., 2011), and *Parenting Your Hyperactive Preschooler* (Herbert et al., 2013) for parents of preschool-age children with elevated levels of hyperactivity/impulsivity. Less intervention work using samples of parents of young children has focused on parenting behaviors related to emotional communication and discussion, but there is a subset of programs that train parents in elaborative and emotion-rich reminiscing (e.g., *Reminiscing and Emotion Training* [RET]; Valentino et al., 2013).

Overall, reviews and meta-analytic evidence show that emotion-focused parenting interventions are effective at enhancing a variety of parental emotion-related behaviors (e.g., emotion coaching, emotion talk) and improving emotion regulation in young children; evidence also indicates that they may be particularly effective for children with clinical difficulties (England-Mason & Gonzalez, 2020; England-Mason et al., 2023). Further, there is one notable knowledge gap. Although parents' emotional competence is often identified as an intervention target (see Table 56.1), many evaluations do not include a measure of parental emotional competence and the efficacy of interventions on this domain requires further investigation.

Interventions in Middle Childhood and Adolescence

Although older children and adolescents have more developed neurobiological and cognitive capacities that enable them to regulate their emotions independently, they often still rely on their parents for help (Morris et al., 2017). Interventions for parents of older children and adolescents tend to move on from some of the rudimentary emotion-related parenting behaviors (e.g., labeling children's emotions) to more advanced skills (e.g., empathy,

emotional communication), as well as comprise multiple components (e.g., addition of school-based components) or specialized therapies that include the child/adolescent (see Table 56.1) (Shaffer et al., 2019). An example of a universal program offered during middle childhood that focuses on both parent and child emotional competence is *Let's Connect* (Shaffer et al., 2019; see Table 56.1). An example of a family-based therapy is *Emotion-Focused Family Therapy*, which has been applied both in universal settings and for targeted populations—for instance, with families of an adolescent with an eating disorder (Lafrance et al., 2020). Similarly, within the TIK suite of programs, there is a universal program called *Tuning in to Teens* (Havighurst et al., 2015) and a targeted intervention for parents with a trauma history and their adolescent (i.e., *Tuning Relationships with Music*). To tackle larger social concerns (e.g., socioeconomic disadvantage, gender-based violence), *Emotion Coaching* parenting interventions are also applied to targeted populations—for example, there is a group-based program for survivors of intimate partner violence (Katz et al., 2020). There is a similarly named *Emotional Coaching* program that has been delivered individually to parents of children with attention-deficit/hyperactivity disorder (ADHD) to bolster parents' emotional coping skills and children's emotional development (Shechtman et al., 2019).

Accumulating evidence indicates that most emotion-focused parenting interventions improve parents' emotion-related behaviors and provide the essential scaffolding for the development of emotional competence in children and adolescents (Havighurst et al., 2020). Comparable to the knowledge gap noted in the previous section, limited work in this area has evaluated interventions' effects on parents' emotional competence, with some evidence indicating that interventions increase parents' emotional awareness and may improve biomarkers of emotion regulation, such as respiratory sinus arrhythmia (Katz et al., 2020). The findings to date are compelling and highlight the potential of emotion-focused interventions for the prevention and treatment of a wide range of difficulties in children, adolescents, and their families.

Moving Forward: An Integrated Model for Intervention Research

To help propel emotion-focused parenting intervention research forward, it may be beneficial to merge what is currently known in the literature examining parenting and child emotion regulation with the recursive steps of intervention research (e.g., Fraser & Galinsky, 2010). The tripartite model of the impact of the family on child emotion regulation (Morris et al., 2007, 2017) has been particularly informative in delineating the interrelations between parenting and child emotion regulation, and could be used to help inform theories of change. Empirical evidence provides support for the interrelated processes outlined in this model (Morris et al., 2017), and based on this evidence, a novel integrated model for emotion-focused parenting intervention research is proposed (see Figure 56.1). This integrated model is intended as a preliminary framework to guide future research in this area, as many experts in the fields of parenting and emotion regulation agree that more research is needed to refine existing models and identify additional predictors, moderators, and mediators (see Eisenberg, 2020; Morris et al., 2017).

Future Directions and Considerations

The first important direction for future research on emotion-focused parenting interventions will be to address the terminological inconsistencies pertaining to emotion-related

TABLE 56.1. Descriptive Characteristics and Emotion-Related Intervention Targets of Emotion-Focused Parenting Intervention Examples

Intervention	Recipients	Instructors (delivery mode)	Duration	Theoretical framework	Direct targets: parent ER domains ^d	Indirect targets: child ER domains
<u>Emotion coaching parenting interventions</u>						
Tuning in to Kids (TIK) ^a	Parents of young children	Trained facilitators (group)	6 weeks (2-hour session/week)	PMEP and EST	1, 2, 3, 4	Child emotional competence
Dads Tuning in to Kids (Dads' TIK) ^a	Parents of young children	Trained facilitators (group)	7 weeks (2-hour session/week)	PMEP and EST	1, 2, 3, 4	Child emotional competence
Tuning in to Toddlers (TOTS) ^a	Parents of toddlers (ages 12–36 months)	Trained facilitators (group)	6 weeks (2-hour session/week)	PMEP and EST	1, 2, 3, 4	Child emotional competence
Tuning in to Teens (TINT) ^a	Parents of older children and adolescents (ages 10–18 years)	Trained facilitators (group)	6 weeks (2-hour session/week)	PMEP and EST	1, 2, 3, 4	Child emotional competence
Tuning Relationships with Music (TRM) ^a	Parents of older children and adolescents (ages 10–18 years)	Trained facilitators (group)	8 weeks (2-hour session/week)	PMEP and EST	2, 3, 4	Child emotional competence and emotion communication
Emotion Coaching	Parents of older children (ages 6–12)	Therapists (group)	12 weeks ^c	PMEP and EST	1, 2, 3, 4	Child emotion regulation
Emotional Coaching	Parents of older children (ages 6–17)	Therapists (individual)	12 weeks (1.5-hour sessions/week)	EST	Emotions involved in being the parent of a child with ADHD	Child emotional development

Emotion communication parenting interventions	
Reminiscing and Emotion Training (RET)	Maltreating parents of preschool-age children
Let's Connect ^b	Parents of school-age children
Emotion coaching and behavioral parenting interventions	
Parent-Child Interaction Therapy—Emotional Development (PCIT-ED)	Parents of depressed preschool-age children
Parenting Your Hyperactive Preschooler	Parents of preschool-age children with elevated levels of hyperactivity/ impulsivity
Family-based therapy	
Emotion-Focused Family Therapy (EFFT)	Parents of school-age children, older children, and adolescents

Note. ER, emotion related; PMEP, parental meta-emotion philosophy; EST, emotion socialization theory; ADHD, attention-deficit/hyperactivity disorder.
^aTIK suite of programs.
^bFormerly known as A Family-Focused Communication Training (AFFECT).
^cSession duration unstated.
^d(1) Parents' histories with emotions that have shaped their beliefs about emotions, (2) parents' emotional competence, (3) parents' communication and responses to their children's emotions, (4) parents' skills related to supporting their children's emotional competence.

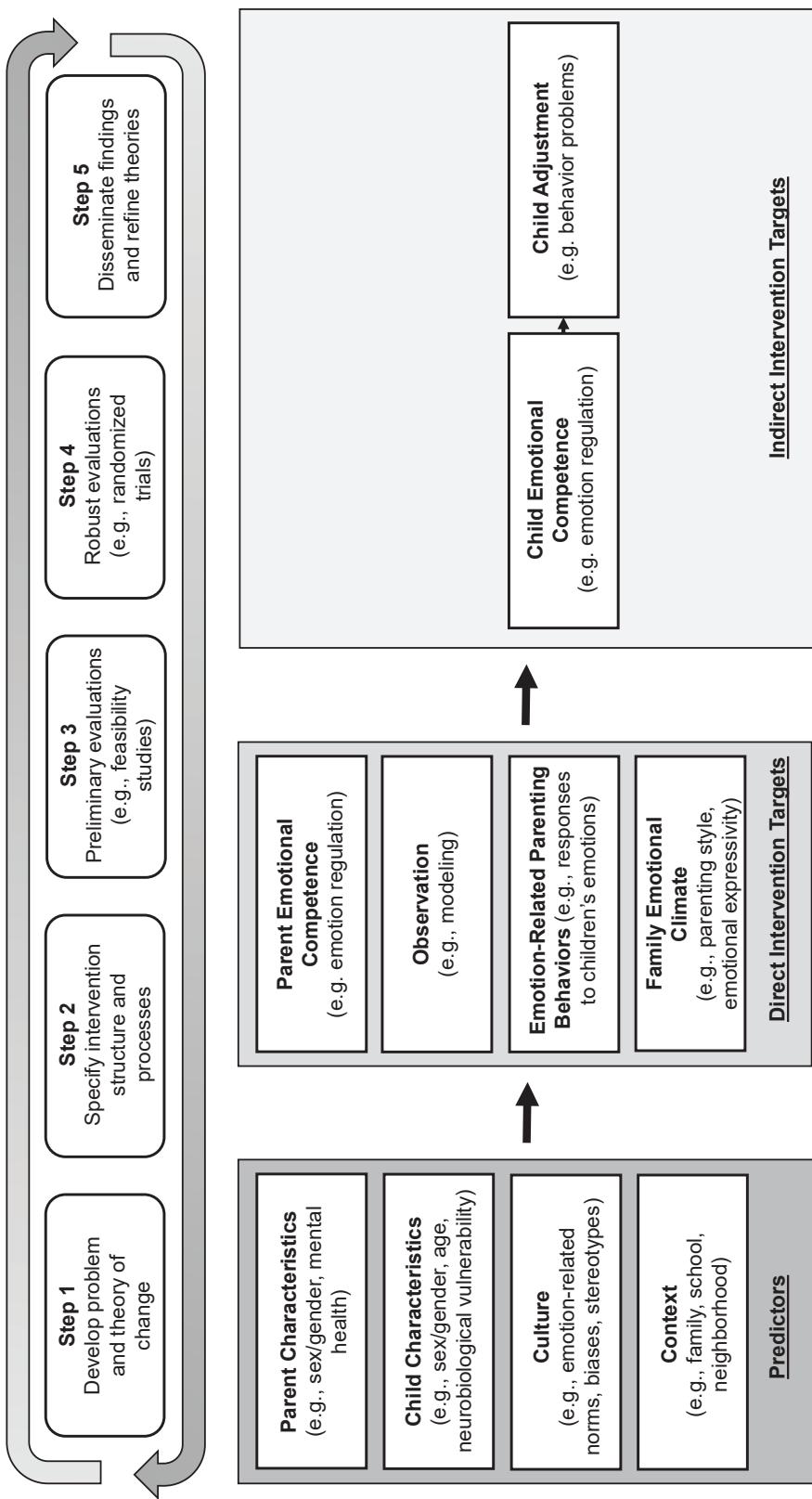


FIGURE 56.1. Integrated model of the intervention research process for emotion-focused parenting interventions. This model is an oversimplification, as there are likely linear relations and interactions between the predictors (i.e., child characteristics, parent characteristics, culture, context), as well additional moderators and mediators of direct and indirect outcomes (e.g., child temperament/personality, neurobiological reactivity) and bidirectional influences between direct outcomes (e.g., emotion-related parenting behaviors) and indirect outcomes (e.g., child emotion regulation).

parenting behaviors and emotion regulation. For example, many emotion-focused parenting programs draw on multiple theories (e.g., PMEP, EST) and incorporate multiple elements (e.g., mindfulness techniques, family systems approach) into their design. Although direct intervention targets can be broadly categorized into the four domains discussed above (see Havighurst et al., 2020), the multidimensional nature of many programs may make some of this categorization artificial and variations in nomenclature may diminish the true proportion of programs that draw on Gottman et al.'s (1996) work (e.g., emotion coaching). It may be more appropriate to codify the targets of emotion-focused parenting interventions as delineated in the proposed integrated model (see Figure 56.1). This model differentiates parent emotional competence from emotion-related parenting as these represent two empirically supported mechanisms through which interventions likely affect children's emotion regulation. Additionally, confusion remains about the distinctions between the subdomains of emotional competence (i.e., emotion knowledge, expression, and regulation), with many purported assessments of emotion regulation likely evaluating other subdomains of emotional competence (e.g., emotion knowledge on the Affect Knowledge Test) (England-Mason & Gonzalez, 2020). Clarifying these conceptual uncertainties is necessary to ensure that emotion-related parenting behaviors and emotion regulation are consistently operationalized, as well as to support the first step of the intervention research process (i.e., develop problem and theory of change; see Figure 56.1).

There are also a few important considerations for future research that examines the next step of the intervention research process: specifying intervention structures and processes. Although many common emotion-focused interventions address multiple emotion-related parenting domains (see Table 56.1), parents' history with emotions is thought to be a key component and is left out of some programs (e.g., PCIT-ED, RET), which may reduce their efficacy. This component can create a "pivotal shift" through enabling parents to become aware of how the emotional climate and attachment relationships of their family of origin shaped their current emotional response patterns (Havighurst et al., 2020). Further, it may be important that intervention content focuses on both parents' and children's emotional competence. There is an ever growing body of evidence indicating that emotion dysregulation serves as a transdiagnostic process (i.e., underlying mechanism) across various psychopathologies (Cludius et al., 2020). This speaks to the promise of targeting emotion regulation as a protective mechanism through which to reduce later psychopathological risk, potentially intergenerationally. Emotion-focused parenting interventions should also be devised for preventing later clinical difficulties and comorbidities in specific populations—for example, children with neurodevelopmental disorders, such as ADHD (England-Mason, 2020). Lastly, early childhood represents a crucial era for early intervention efforts, as the period spanning from infancy to preschool age is recognized as a critical period for the development of emotion regulation (Morawska et al., 2019). The development and implementation of future emotion-focused parenting interventions will likely have to be a thoughtful and iterative process, as although the addition of emotional development modules to existing therapies has proven successful (e.g., PCIT-ED), adding an emotion component to an established parenting program may not always be effective (e.g., Emotion Enhanced Triple P) (England-Mason & Gonzalez, 2020).

The latter steps of the intervention research process for emotion-focused parenting interventions involve the conduct of evaluation studies (e.g., feasibility studies, randomized controlled trials) and the estimation of effects, which give rise to some methodological concerns. Across parenting intervention research there is an overreliance on

parent-report (e.g., self-report of parenting, parent-report of child outcomes) measures. Future work on emotion-focused parenting interventions would benefit from a multi-method approach (e.g., parent report and behavioral observations), as this may help reduce bias and produce more trustworthy estimates of effect. Relatedly, as emotion regulation is increasingly recognized as a multifaceted (i.e., sensory, attentional, neurobiological, cognitive, sociocultural) construct that is employed in a contextually dependent manner, emotion-focused intervention work may also benefit from adopting a multidimensional framework, such as developmental systems theory (Thompson, 2011). This may be particularly important in this context, as neurobiological, hormonal, and psychological changes shape parents' reactivity to children's cues (e.g., distress) and their ability to facilitate emotion regulation in their child (Rutherford et al., 2015). Further, many of the "parental brain" networks are those involved in processing emotional information (i.e., temporal and occipital lobes), emotional responses (i.e., amygdala, insula, striatum), and self-regulation (i.e., prefrontal cortex, anterior cingulate cortex) (Swain et al., 2012)—however, understanding of how the structure and function of these brain regions might be influenced by intervention programs is largely unknown, as well as the intervention's effects on other important biomarkers (e.g., hormones, epigenetics). These are important avenues for future investigations and could provide compelling evidence that emotion-focused parenting interventions promote neurobiological resilience and lessen the social, economic, and health care burdens associated with neurobiological vulnerability.

In conclusion, the body of literature examining emotion-focused parenting interventions has provided evidence that these types of approaches are an effective means of improving emotion-related parenting behaviors and hold promise for positively influencing emotion regulation and transdiagnostic processes in children, adolescents, and their families. Methodologically robust implementation and evaluation studies of emotion-focused parenting interventions should be prioritized, following which other important questions, such as "What works best?" "For whom?" and "At what time?", can be answered.

ACKNOWLEDGMENTS

Gillian England-Mason is supported by a Canadian Institutes of Health Research Fellowship and a Postgraduate Fellowship in Health Innovation provided by Alberta Innovates, the Ministry of Economic Development, Trade and Tourism, and the Government of Alberta.

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CHAPTER 57

Teaching Emotion Regulation in Schools

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KALEE DE FRANCE

From infancy to late adulthood, the ability to regulate emotions is important for a wide range of well-being indices (see Cludius & Ehring, this volume, among others)—however, this essential ability is not something that children possess innately, nor is it something that manifests in a homogeneous manner across individuals (John & Gross, 2007). Indeed, in order for youth to effectively deploy the complex skills needed to manage emotions, those skills must be fostered, modeled, and taught explicitly. In this chapter, we define emotion regulation and emotion regulation instruction and review the research on the benefits of social and emotional learning—the approach by which emotion regulation instruction is often delivered in schools. We then describe some best practices of school-based emotion regulation instruction, including how to avoid common missteps and address some common concerns.

Teaching Emotion Regulation

Emotion regulation is defined as “the process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (Gross, 1998, p. 275). To teach emotion regulation is to model and explicitly pass on one’s knowledge of this process, to provide youth with tools and time to practice and develop their skills, and to establish routines and policies that allow space for emotions and emotion regulation.

Teaching emotion regulation skills within schools has also become a principal component of many educational practices. Within schools, the teaching of emotion regulation skills is often a component of social and emotional learning (SEL) initiatives. One of the key motivations behind SEL within the school setting is that through intentional and guided reflection and instruction within a safe, classroom environment, children can learn to recognize their own intentions and impulses, manage their emotions and

reactions, direct their attention in functional ways, and develop prosocial relationships with their peers and the adults in their school (Elias et al., 1991). SEL has become recognized as a critical component of student well-being and academic success (Weissberg et al., 2015). Moreover, a recent cost–benefit analysis of six prominent SEL programs found that implementation yielded a positive financial return on the original investments in these programs at a ratio of approximately 11:1 (Belfield et al., 2015), as determined by reductions in specific problem behaviors (e.g., conduct issues, aggression) and what society spent on these specific behaviors through the health care and educational systems at the year of publication. These results signify that even the most fiscally conservative societies are likely to benefit from SEL programming.

The Benefits of SEL in School

While emotion regulation instruction can and does occur within many contexts of a child's life (home environments, sports or arts programs, within community or spiritual organizations), children are given varying degrees of feedback or direction on how to gain insight into, and how to effectively regulate, their emotions. There is therefore a unique importance to integrating high-quality (e.g., empirically supported, systemic) SEL into educational institutions.

First, the skills at the core of SEL are essential for youth to succeed within schools, both academically and socially. From the earliest school years all the way through to the end of secondary school, evidence from large-scale research reviews and meta-analyses shows that students who receive high-quality (i.e., sequenced, active, focused, and explicit [SAFE]) and well-implemented SEL programs (i.e., no reported implementation problems) display more positive social, emotional, behavioral, and academic outcomes (e.g., Durlak et al., 2011). Specifically, in the realm of academics, a meta-analysis found that participation in an SEL program translated into an 11 percentile-point gain in achievement (Durlak et al., 2011). Longitudinal investigations of these effects found that these academic benefits endure the test of time: Completion of SEL programming translated to a gain of 13 percentile points at follow-up (Taylor et al., 2017), and students who received SEL are more likely to graduate from high school (Taylor et al., 2017). Put simply, social emotional skill and academic achievement rise or fall together; with SEL clearly providing students with skills supportive of school success.

Providing SEL programming within a school context has the potential to be a powerful equalizer for students who do not otherwise have access to high-quality SEL. Many young students enter school without the emotional, social, and behavioral skills necessary to succeed (e.g., Raver & Knitzer, 2002), and these difficulties tend to occur in a greater magnitude among youth who are already facing systemic disadvantage. For example, youth living in poverty (De France et al., 2022), youth belonging to nonheteronormative sexual orientations (Hatzenbuehler et al., 2008), and youth who face increased racial and ethnic prejudice (Mekawi et al., 2020) often face increased levels of stressors and systemic oppression that overwhelm and undermine their abilities to regulate emotions (Vargas & Mittal, 2021). As such, providing SEL programming within the school context is a mechanism to directly address the inequities that these students face. When we look at studies assessing in-school SEL programming, effect sizes of program effectiveness are consistently and significantly larger for high-risk students (e.g., Jones & Bouffard, 2012).

While not all SEL approaches and programs have an explicit focus on emotion regulation, self-regulation, including the management of emotions, is a frequent target. Most

children spend more time in school than in any other context. For youth to develop strong emotion regulation skills, they must be consistently and continuously discussed, taught, and reinforced. More so than academic skills, emotion regulation skills need to develop within daily life as youth face social challenges and emotionally activated events (Jones & Bouffard, 2012). A school environment that is not equipped to provide informed emotional support may actually undermine parents' efforts to teach their children strong emotion regulation skills. For example, how adults talk to students and how challenging situations are handled, like transitions and social problem solving, can have a big impact on whether emotion regulation skills are reinforced or diminished (Jones et al., 2008).

Best Practices and Avoiding Common Missteps

In this final section, we describe some key components of effective emotion regulation instruction and how these practices can help to avoid common mistakes and dispel misconceptions. Where helpful, we provide examples from RULER, a systemic approach to SEL for preschool through high school that focuses on the skills of emotional intelligence, including emotion regulation (Brackett et al., 2019).

Educators First

While it is tempting to jump straight to supporting students' growth, especially in schools that struggle with behavioral concerns or in the wake of COVID-19, we must acknowledge that the pathway to regulated students begins with regulated adults (Jennings & Greenberg, 2009). For students to learn effective emotion regulation strategies at school, educators must possess emotion regulation skills that can be modeled and used for coregulation and must feel knowledgeable and confident to teach those skills to their students (Denham et al., 2012). Though most educators agree that emotion skills instruction is important (Bridgeland et al., 2013), they also report not receiving enough support or adequate training (Reinke et al., 2011). To address this, training can begin with educator personal and professional development. For example, the RULER approach suggests a full year of educator personal and professional development before student implementation, giving educators space and time to expand their personal toolkit of regulation strategies, practice their skills of coregulation, and plan for how they will instruct their students. Time to prepare is crucial: Not only do students have more positive outcomes when educators hold positive attitudes toward SEL and deliver content effectively in ways consistent with the program's philosophy but low-quality implementation (delivered by educators who are resistant or who have poor delivery) can actually be harmful (Reyes et al., 2012).

Serving educators first highlights the importance of educator well-being. No new initiative can succeed when staff are burned out, stressed, or disengaged. Moreover, as educators experience the personal benefits of emotional intelligence skills on their own performance, relationships, and overall well-being, there is a mindset switch from *having* to teach the SEL content, to *wanting* to share their insights and strategies with their students. SEL then shifts from being "another thing," which is a common pitfall for new initiatives, to being seen as foundational to success. Recent research has supported this "adults-first" approach, finding both direct benefits to the educators and positive effects on students before any explicit instruction has begun (Baumsteiger et al., 2022).

Honoring Individuality

A challenge with teaching emotion regulation strategies is that there is no single, correct way to regulate, and strategy preferences and effectiveness vary across students (John & Gross, 2007; Ramzan & Amjad, 2017). Whereas more research is needed on individual differences in emotion regulation, theory and practice tell us that while some students may prefer to talk with a friend, others may wish to draw, exercise, or journal. Teaching emotion regulation to students is therefore about helping each child find those strategies that work for him or her. Beginning with educators, professional development can raise people's awareness of their own strategy preferences and interrogate any biases they may hold about which strategies are deemed appropriate or accessible and by whom. Educators can challenge themselves to expand the strategies available in their classrooms (e.g., Is it OK for students to stand instead of sit if it helps them focus?). As inevitably some strategies are less available at school (e.g., playing with pets), educators may also choose to focus on teaching cognitive strategies, such as positive self-talk or positive reappraisal, that students can access anytime.

A wide variety of available strategies in the classroom serves several purposes. First, it allows students to explore and experiment, adding to their strategy “toolbox.” Exposure to strategies like mindful breathing, gratitude, and movement breaks during the school day may expand their repertoire. Second, honoring the individuality of each student’s emotions and their preferred regulation strategies is key to combating the misconception or misapplication of SEL as a tool for compliance and control. In reality, emotion regulation instruction should never suppress or invalidate a person’s emotional experience, nor insist that everyone regulate the same way. Rather, the teaching of emotion regulation is a focus on helping students manage their feelings in ways that allow them to achieve their goals (see Tamir & Hu, this volume).

Family Involvement

Increasingly parents and guardians want to understand what is being taught in their children’s classrooms and to have the opportunity to voice any concerns. Schools must communicate with parents about what emotion regulation instruction is and isn’t, and work with families to establish common goals. A nationally representative survey of 2,000 parents of K-12 students conducted in 2021 found that while the vast majority of parents support students learning skills, such as to “understand, express, and control their emotions” or “empathize with the feelings of others,” they respond quite negatively to the term *social-emotional learning* (Tyner, 2021). Another parent study (Hubbard, 2018) led to similar conclusions: Nationally, parents expressed concerns that children would be taught what to feel, judged against standards, or labeled for life. The report suggested that school-to-home communications should (1) adopt the mindset that emotion regulation skills begin at home and are reinforced at school; and (2) speak in plain language, using descriptions of skills rather than jargon, backed up by real-life examples.

As with all learning, encouragement and reinforcement of emotion skills across contexts is beneficial (Albright & Weissberg, 2010). With the RULER approach, pre-school and elementary school units focus on specific feeling words (e.g., *excited, lonely, sad*), and as students learn the definition, causes, and regulation strategies, they are also encouraged to discuss the feeling with a family member, record their conversation, and share their stories in class. Family workshops hosted by the school on topics relevant to

parents (sibling rivalry, big feelings at bedtime), are another avenue to forge home–school connections and support caregivers in building emotion regulation skills in their children but also in themselves (Brackett et al., 2015).

A Developmental Lens

The successful teaching of emotion regulation skills naturally requires a developmental lens. Content and expectations must vary with age to acknowledge what strategies are feasible and preferred depending on students' cognitive development. For example, preschool children rely on more behavioral strategies, such as distraction or support from a comforting adult (Zimmer-Gembeck & Skinner, 2011), and can use some cognitive strategies with support (Hua et al., 2015). In middle childhood, the autonomous use of cognitive strategies increases (Zimmer-Gembeck & Skinner, 2011). This means that while preschool teachers usually play an active role in helping a child to select and deploy an effective strategy (e.g., "Maybe we should take some deep breaths"), older children are more self-reliant (e.g., "What might be helpful right now?"). Adolescents are not only more independent in their emotion regulation but begin to develop the skill of selecting strategies by emotion and context (Riediger & Kilpker, 2014), such as knowing when to use social support to cope with a problem beyond their control, and when to deploy more active problem solving for a scenario that can be resolved. The educators' role therefore becomes more supportive, guiding teens to think not only about emotion regulation strategies that will make them feel better in the moment but also how they will be helpful in the long term.

Conclusion

Research shows us that emotions matter: for attention, memory, and learning and for decision making, relationships, and health (Brackett, 2019). How well we manage our emotions determines whether they help or hinder us in each of these areas and students deserve to be equipped with the emotion regulation strategies they need at home and at school. Zero-sum concerns over SEL and academics competing for "teaching minutes" must be continually debunked. Skilled and supported educators regularly harness opportunities to enhance academic content with SEL and meet their students' academic and emotional needs simultaneously. This can happen in literature when discussing a character's emotions, in art classes where students make emotion regulation strategy walls, and with librarians displaying books specific to a feeling word of the month. Even science teachers have drawn parallels between emotion regulation with boiling points and freezing points and math teachers have connected emotional experiences to vectors, concepts of calibration, and normal curves. Regulation strategies for handling test anxiety can be discussed and practiced in any subject area, and the regulation of unwanted feelings can be modeled by all student-facing adults.

When emotion regulation is integrated, it becomes part of what schooling is, preparing students to meet the world with the social, emotional, and academic skills to succeed. This goal takes a family–school–community partnership and requires continued research into both basic science questions around the development of emotion regulation in children and individual differences in strategy effectiveness and preference, as well as applied inquiry into the most impactful ways to bring emotion regulation instruction into the classroom.

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SECTION XII

**PHYSICAL HEALTH
IMPLICATIONS**

CHAPTER 58

Emotion Regulation and Cardiovascular Health

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Emotions have long been linked with physical health, as both a consequence and a predictor of health changes. How individuals manage emotions, or emotion regulation (ER), is increasingly considered as a predictor (or “determinant”) of future health maintenance and decline, with rigorous studies primarily focused on linkages with cardiovascular disease (CVD) (DeSteno et al., 2013). In this chapter, we first present a conceptual explanation of why ER may matter for physical health. Then, we provide a summary of key studies that explicitly evaluated whether ER predicts future CVD, as most of the existing research has focused on this health condition. We also review potential pathways linking ER to cardiovascular health and conclude with a discussion of key methodological issues that should inform future research in this promising area.

Emotion Regulation and Physical Health

ER is a transdiagnostic, higher-order process involved in determining and shaping both positive and negative psychological states (see Gross, this volume; Cludius & Ehring, this volume). Because of this overarching role, scholars have posited that ER processes underlying the generation and unfolding of emotional states are themselves linked to health. This may help explain how and why positive and negative emotions appear to predict physical health conditions (or “outcomes”), as depicted in Figure 58.1 (Trudel-Fitzgerald et al., 2015, 2017). Thus far, health research has mostly focused on two ER strategies (see Uusberg & Uusberg, this volume; English, this volume): reappraisal (reinterpreting an event’s meaning to alter emotional responses) and suppression (inhibiting emotional behavior). Less work has examined other ER strategies, including experiential avoidance

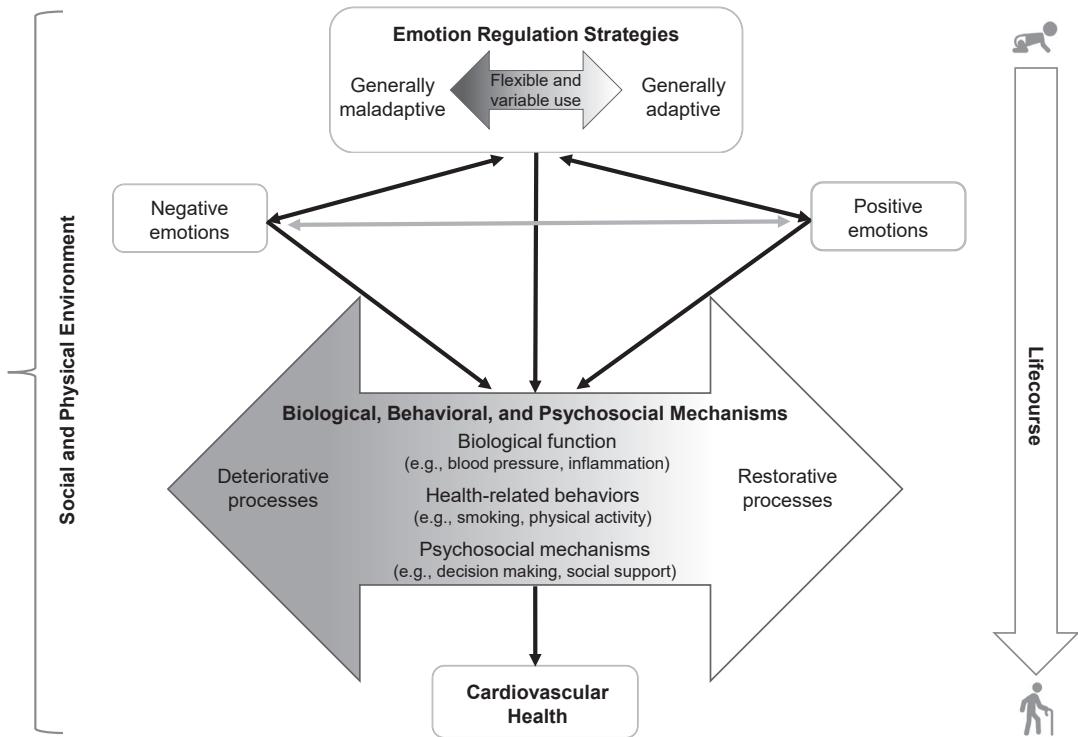


FIGURE 58.1. Conceptual model of the emotion regulation–cardiovascular health relationship. While bidirectional effects between emotion-related factors and biological, behavioral, and psychosocial processes are likely, following the focus of this chapter, only single-direction arrows are shown. Similarly, the depicted processes might also be involved with coping strategies and in health outcomes beyond cardiovascular ones. Shaded gradients represent a continuum, from less to more flexible/variable use of ER strategies, and from deteriorative to restorative biological, behavioral, and psychosocial mechanisms, respectively. Model adapted from Trudel-Fitzgerald et al. (2015, 2017).

(the unwillingness to experience specific emotions/situations; Boulanger et al., 2010) and its conceptual opposite: acceptance.

Given the possible health benefits of positive emotions and damage caused by negative emotions (DeSteno et al., 2013), investigators have postulated that greater reliance on reappraisal and acceptance are more adaptive for physical health because they are typically linked with lower negative emotion and/or higher positive emotion levels than suppression and avoidance (see Uusberg & Uusberg, this volume; English, this volume; Boulanger et al., 2010). Empirical evidence is consistent with this hypothesis (Trudel-Fitzgerald et al., 2017) and Figure 58.1 provides a model illustrating these processes in relation to CVD. As the appropriateness of each regulatory strategy is likely context dependent rather than inherently (mal)adaptive, the ability to switch from one strategy to another flexibly across contexts is also characteristic of adaptive ER (see Kalokerinos & Koval, this volume).

In health research, ER has been studied as either a *marker of adjustment* to or a *determinant* of chronic diseases. For the former conceptualization, studies usually consider the extent to which ER strategies employed by individuals who are medically ill

shape psychological adjustment to their health condition. Overall, findings suggest that patients with chronic diseases (e.g., cancer, diabetes) who rely more heavily on strategies deemed maladaptive, like suppression, are more likely to adjust poorly to their condition, whereas evidence that strategies identified as adaptive, like reappraisal, are associated with better adjustment to chronic disease is more mixed (Baziliansky & Cohen, 2021; Guimond et al., 2019; Kane et al., 2018).

For the latter conceptualization, ER represents a factor that might predict future disease development among initially healthy individuals, with effects occurring via distinct pathways, including biological, behavioral, and psychosocial factors (see Figure 58.1). Aside from ER, coping is another closely related regulatory process widely studied as a marker of adjustment among medical populations and, increasingly, as a determinant of future physical health. Because research on ER as a health determinant is relatively limited, in this chapter we draw evidence from both the ER and coping literatures, despite research on their linkages to health often being conducted separately. ER and coping differ in several ways but also share conceptual features (see Compas et al., 2014, for more details). Given such overlap, many—although not all—individual regulatory strategies can be considered both as ER and coping related, and thereby relevant to health research. Thus, we discuss prior findings without distinguishing whether they arise from ER or coping frameworks.

Emotion Regulation as a Determinant of Future Cardiovascular Health

Numerous studies have examined ER and coping in relation to survival among medical populations (Petticrew et al., 2002). Yet, the role of regulatory strategies in disease/mortality may differ among individuals who are versus are not generally healthy. From a primary prevention perspective, ER may represent a cost-effective intervention target to prevent chronic disease development given its transdiagnostic and modifiable nature (see Cludius & Ehring, this volume; Sections X and XI on interventions, this volume). Evidence for ER–health associations within the general population is limited but preliminary findings on CVD etiology are promising.

Epidemiological Evidence

Studies using the most rigorous methods available (prospective and longitudinal design, validated measures) suggest that ER relates to subsequent CVD development in initially healthy adults. For instance, a large study showed fantasizing—immersing in one’s imagination to disengage from stressors—was related to a 28% increased risk of developing CVD, whereas reappraisal was associated with a 25% lower risk of CVD death; other strategies, including self-blame, were unrelated to CVD development/mortality (Svensson, Inoue, Sawada, Yamagishi, et al., 2016). Other results indicated a 30% higher risk of CVD mortality among frequently angry men who usually regulate anger with aggressive expression (Trudel-Fitzgerald et al., 2021).

Although these studies mainly used self-reported scales to evaluate how individuals *generally* regulate their emotions, studies using other methods showed similar findings. In one study, adults evaluated whether they would suppress their anger in hypothetical frustrating situations involving their spouse and a policeman, separately (Harburg et al., 2003). CVD mortality risk was 40% greater in men reporting they would suppress their anger toward a policeman only, but 62–128% greater in women reporting they would

suppress anger in both contexts. In a study examining objectively assessed anger management strategies (scores derived from videotaped anger-provoking interviews) with CVD development, associations with the use of maladaptive and adaptive strategies were found in expected directions (Davidson & Mostofsky, 2010).

Biobehavioral Pathways

In most epidemiological studies, associations persist after accounting for participants' sociodemographic characteristics and health status—however, associations are sometimes attenuated after controlling for health behaviors and certain biological markers, implying that biobehavioral factors connect ER to CVD health (see Figure 58.1). Research explicitly evaluating the role of regulatory processes in health behaviors uptake and biomarker levels among healthy adults is limited and mostly cross-sectional, but still informative.

Health behaviors can be considered restorative (e.g., physical activity) or deteriorative (e.g., smoking) for long-term health. In most epidemiological studies, behaviors are queried in general terms, capturing *habitual* behaviors individuals may adopt to promote physical health (e.g., weekly frequency of vigorous physical activity), be socially engaged (e.g., number of alcoholic beverages consumed on weekends), or respond to a craving (e.g., current tobacco smoking)—however, such behaviors could also help manage emotional experiences (Mezuk et al., 2017). Limited research has examined behaviors' role in the ER–health relationship. Yet, converging evidence suggests maladaptive ER strategies (e.g., rumination) relate to deteriorative behaviors like emotional eating that, in turn, likely contribute to obesity development (Aparicio et al., 2016). Teasing apart habitual from regulation-motivated habits, and their respective contribution to the ER–health linkage, is conceptually challenging but necessary to advance understanding.

Biological studies have mainly relied on objective measures of deteriorative biomarkers, like inflammation and cortisol. Recent reviews reported that greater suppression use is associated with unhealthier inflammatory profiles, whereas more frequent reappraisal relates to healthier ones (Mathur et al., 2022; Moriarity et al., 2023). Multiple studies also demonstrate associations of sustained rumination with hyperactivation of the hypothalamic–pituitary–adrenal axis, as characterized by dysregulated cortisol levels (Compare et al., 2014). Another biomarker of interest is heart rate variability (HRV), which represents the variability in the time interval between heartbeats. The high-frequency (HF-HRV) component reflects the parasympathetic nervous system's influence on the heart; higher levels have been conceptualized as physiological, transdiagnostic markers of healthier ER (Thayer et al., 2021). Because lower HF-HRV is a risk factor for CVD (Thayer et al., 2021), HRV may be another pathway through which ER impacts health—however, methodologically rigorous studies are needed to confirm these pathways given bidirectionality in the relationship between ER and HF-HRV (Visted et al., 2017).

Methodological Considerations and Future Directions

Critical insight about ER's role in physical health will be gained from future longitudinal studies on CVD development and related biobehavioral pathways. Below, we consider key methods and selectively highlight additional diseases/pathways, factors that shape ER, and life course periods that deserve more empirical attention.

Study Design and Causal Inferences

For practical and ethical reasons, evaluating whether persistent use of certain ER strategies truly *causes* the development of long-term diseases in randomized controlled studies is rarely feasible. Therefore, prospective cohort studies that measure ER prior to disease development are the most rigorous designs available for testing this hypothesis—however, observational designs remain susceptible to confounding by unmeasured factors (e.g., genetics). Experimental research on biobehavioral processes that are established risk factors for diseases can provide proof-of-principle that ER alters physical health. For instance, meta-analytic results showed that, among participants confronted with visual emotional content and then instructed to down-regulate their negative emotions, suppression versus reappraisal was more strongly associated with cardiovascular responses (Zaehringer et al., 2020). Ultimately, triangulating across different study designs will solidify causal inferences.

Measure Availability and Construct Operationalization

Few epidemiologic studies measure ER and, when they do, most investigators examine the effects of individual ER strategies on health. This approach specifies physical and psychological costs/benefits associated with each strategy but may overlook ER's complex and dynamic nature. Future research might consider *combinations* (or blends) and *sequences* of strategies used (Ford et al., 2019). For example, when faced with an intense emotion after receiving a chronic disease diagnosis, combining distraction and reappraisal might be optimal: distraction first reduces the immediate intensity of the emotion, which enables a more effective use of reappraisal afterward.

Also less studied in health research is the role of ER variability and flexibility (see Kalokerinos & Koval, this volume). Since flexible and variable use of ER strategies across contexts is a central goal of many psychotherapies (see Section X, this volume, Interventions: Clinical Settings), various questions about its long-term physical health implications must be answered: Is it the number of strategies used or the variability in frequency with which strategies are used that matters most? Is the association between variability and long-term health linear, whereby more is inherently better? A moderate variability level may reflect flexible use of several strategies, whereas greater variability may indicate erratic and unsuccessful trials to adapt. If so, moderate but not greater variability levels may protect against disease development over time. Accordingly, a recent study showed that moderate versus greater variability levels were related to longer lifespan (Trudel-Fitzgerald et al., 2022), suggesting that additional research examining variability's role in future physical health may provide important insights.

Other Health Outcomes and Psychosocial Pathways

Because many chronic diseases and mortality share common biobehavioral risk factors (e.g., inflammation, smoking), ER likely predicts various health outcomes. Several studies have linked suppression with greater risk of all-cause mortality (Chapman et al., 2013; Harburg et al., 2003)—however, findings are less consistent with cancer. For instance, positive reappraisal, but not other strategies, was associated with reduced cancer mortality risk, whereas no relationships with cancer development were evident (Svensson, Inoue, Sawada, Charvat, et al., 2016). Replication in diverse samples and investigation of other conditions (e.g., diabetes) are warranted.

Substantial research has demonstrated that emotions can affect risk perception, and thus may be key upstream determinants of health-related decisions with, occasionally, divergent effects over time (DeSteno et al., 2013). For example, feeling sad may override risk perception and nudge someone toward eating chocolate rather than exercising, which results in short-term pleasure but long-term health decline, should such decisions become habitual. Thus, ER capacity may affect when and how individuals make tradeoffs between behaviors with short- and long-term costs/benefits for health. In parallel, the importance of emotions in establishing social relationships, which are themselves linked to physical health, is well-known (Smith & Weihs, 2019). ER often occurs in social contexts and shapes relationships (see Sections V and VI, this volume, on social aspects), providing another potential pathway by which ER may impact health.

Contribution of the Socioenvironment

Socioenvironmental factors like culture, discrimination, and socioeconomic status can contribute to selection and implementation of some ER strategies over others (see Section VI, Social Aspects: Groups and Collectives). Research considering these factors' role in ER is critical, partly because socioenvironmental factors also drive health disparities (Jilani et al., 2021). Existing studies, albeit limited, are informative. Results on sex/gender differences showed that women were more likely to seek social support, but less likely to use suppression and alcohol to adapt to stressors, and employed more varied strategies than men (Carver et al., 1989; Gross & John, 2003; Mezuk et al., 2017). Other studies, focused on sexual orientation, found sexual minority individuals versus heterosexual individuals used less adaptive strategies (e.g., rumination) to handle psychosocial stressors (Hatzenbuehler et al., 2009). Considering ecological factors, some findings showed that children living in high- versus low-crime neighborhoods were less likely to express emotions like sadness or fear, which may reflect greater emotional suppression (McCoy et al., 2016). Emerging work further hints that proximity to green space promotes reappraisal, and decreases rumination and suppression (Bratman et al., 2021).

Life Course Perspective

Learning to regulate emotions is a major developmental milestone (see Section IV, this volume, Developmental Considerations). Research assessing ER–health associations in childhood typically focuses on ER correlates, like internalizing/externalizing behaviors—however, several studies measured ER more directly either via laboratory tasks (e.g., video coding of children's regulatory behavior) or self-reported scales. Preliminary results suggest that greater use of maladaptive strategies is associated with higher body weight and unhealthy behaviors, including poor diet quality (Aparicio et al., 2016). Other scholars have identified a regulatory strategy dubbed “Shift-and-Persist,” whereby youth use reappraisal to reduce the negative emotional impact of stressful experiences but remain optimistic about their future; early findings showed that this strategy was associated with lower inflammation, but only among lower-income adolescents (Chen et al., 2015).

Conclusions

Altogether, accumulating evidence points to the role of ER (and coping) strategies in cardiovascular health, with suggestive preliminary findings about plausible biobehavioral

pathways. Considering other health conditions and pathways in future studies will extend our understanding of ER's role in physical health. Moreover, interdisciplinary science increasingly proposes that individuals' environmental affordances and opportunities to regulate emotions and cope with stressors throughout life may, in turn, be embodied to drive health disparities (Hatzenbuehler et al., 2009; Mezuk et al., 2017). Therefore, subsequent research explicitly considering the ER–health relationship at different life course periods, and in distinct socioenvironmental contexts, will provide novel insights not only into whether and how ER matters for lifelong health but also when and for whom these processes are most potent.

ACKNOWLEDGMENTS

Claudia Trudel-Fitzgerald is the Junior Research Chair on Social Disparities, Stress-Related Coping, and Health at Université du Québec à Trois-Rivières. Anne-Josée Guimond received a postdoctoral fellowship from the Canadian Institutes of Health Research and salary support from the Lee Kum Sheung Center for Health and Happiness at the Harvard T. H. Chan School of Public Health. This chapter was also informed by the Michigan Integrative Well-Being and Inequality (MIWI) Training Program, which is funded by a grant from the National Institutes of Health (No. R25-AT0106641).

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CHAPTER 59

Sleep and Emotion Regulation

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Omnipresent relationships between poor sleep and mental health problems across the lifespan have compelled a new era of scientific inquiry, focused less on the description of how sleep and psychiatric disorders overlap and more on the cognitive, behavioral, physiological, and neurobiological mechanisms they share. The construct “emotion regulation” is at the forefront of this line of investigation, and for good reason. Similar to emotions, optimal sleep–wake patterns require everyday regulatory input from both internal and external sources. More appreciably, “dysregulated sleep,” just like poorly regulated emotions, can manifest in myriad forms and exert a wide range of negative consequences. Sleep periods that are too short or too long, variable from night to night, inappropriately timed (i.e., not in phase with clock time), inadequately consolidated, and/or generally nonrestorative hold the potential to impair regulatory control of one’s emotional responses. It is also true that poorly regulated emotions can impair sleep, though available studies are largely based on cross-sectional designs. In this chapter, we review recent experimental evidence for the bidirectional influences of sleep on emotion regulation and vice versa, guided by Gross’s model of emotion regulation (Gross & Thompson, 2007). We begin with a brief overview of sleep regulation. We then consider recent experimental studies that provide evidence of causal relationships. Finally, we emphasize several critical directions for future studies.

Sleep–Wake Regulation

Sleep is a reversible condition of lowered consciousness, decreased reactivity to external stimuli, and reduced motor activity that occupies approximately one-third of the human

lifespan. Sleep–wake periods are cyclical, with most adults experiencing one nighttime sleep period during the 24-hour day, consisting of both rapid eye movement (REM) and non-REM (NREM) sleep. This cycle arises through the interplay of homeostatic and circadian processes (Borbély et al., 2016). Homeostatic pressure (i.e., drive for sleep) increases with time spent awake and dissipates during sleep. It directly influences sleep intensity (i.e., depth of sleep) and structure (i.e., time spent in specific sleep stages across the night). Along with a host of other biological mechanisms, circadian rhythms influence the timing of sleep, synchronizing our sleep–wake cycle with the earth’s 24-hour light–dark cycle. Although homeostatic and circadian regulation of sleep are independent processes, their synchronization is essential in the duration or timing of sleep for even one night influences subsequent sleep timing, intensity, and structure, each of which contributes to healthy sleep patterns. Importantly, sleep timing and duration also differ based on sex, age, chronotype (i.e., preferred timing of sleep and waking activities), and other individual factors, contributing to greater sleep risk in certain individuals.

Emotion Regulatory Impacts on Sleep

Very few experimental studies have examined the effects of specific emotion regulatory strategies on subsequent sleep periods. In a 2012 study, participants were asked to use one of two regulatory strategies (i.e., writing about their thoughts or about their emotional experience) after “failing” a cognitive task and before a night of sleep (Vandekerckhove et al., 2012). Participants who reflected on their affective experiences required slightly longer to fall asleep but woke up less often and slept longer compared with those who were instructed to analyze the causes and meaning of their failure; however, this cognitive manipulation notably shares overlap with the construct of rumination, a known contributory factor to insomnia (Harvey, 2002). In a more recent study using the same paradigm, participants were asked to reflect on their emotional experience, use cognitive reappraisal, or focus on neutral aspects of the task (control group) prior to sleep (Wang et al., 2022). However, the three groups did not differ in any sleep parameter, which may be due to all groups (including the control group) utilizing adaptive emotion regulatory strategies.

Sleep’s Impacts on Emotion Regulation

Studies utilizing sleep manipulations to examine the effects on emotion regulatory abilities are far more abundant. Our group synthesized these findings in a prior review according to the five dimensions of Gross’s model (Palmer & Alfano, 2017). For brevity, we provide an update to the findings from our 2017 review below.

Situation Selection

Experimental findings showing that poor sleep impacts the situations individuals both seek out and avoid in service of altering their emotions are relatively scant, though indirect evidence is beginning to emerge. Using a social distance task, Ben Simon and Walker (2018) showed that adults who were sleep deprived for 24 hours preferred to maintain greater physical distance from others compared to when rested. Another recent study showed “social preference” to be differentially influenced by prior sleep deprivation

(Grèzes et al., 2021). Specifically, adults who were sleep deprived for 27 hours more commonly chose not to sit next to individuals with fearful faces in a waiting room compared to rested controls. Other experimental findings suggest that reduced motivation for social and physical activities (e.g., walking, shopping) when one is tired is driven by heightened motivation for behaviors that increase the likelihood of sleep (e.g., being at home, lying in bed; Axelsson et al., 2020). Together, these findings suggest that inadequate sleep duration at least partially influences the social situations individuals choose to participate in and avoid.

In a study among adolescents, the relationship between situation selection and actigraphy-assessed sleep was examined across 1 week (Palmer et al., 2020). Situation selection was assessed via trait-based measures, daily questions, and a novel in-lab task where adolescents could choose to view any of several brief video clips based on descriptive information about the emotion it was expected to elicit (e.g., “Seal catches a ride—happy”). Rather than average sleep duration across the week, greater variability in sleep timing (i.e., night-to-night changes in sleep–wake patterns) significantly predicted less trait-based and daily avoidance of negative situations and was (marginally) associated with greater selection of negatively valenced video clips. These findings dovetail with burgeoning findings revealing that, in addition to sleep duration, other dimensions of sleep health influence emotional health and well-being (Buysee, 2014).

Situation Modification

Understanding how sleep might impact situation modification presents a considerable challenge for experimental research given the multitude of ways this regulatory strategy can be implemented and undermined. For example, deficits in perspective taking, empathy, and impulse control, all of which have been reported following periods of sleep deprivation, can directly impair the ability to effectively alter a situation in the service of an emotional goal. In a study among adolescents, participants invited a friend for an in-lab discussion of a prior conflict both after a night of sleep restriction (i.e., 4 hours in bed) and sleep extension (i.e., 10 hours in bed; McMakin et al., 2016). Compared to when rested, sleep-restricted adolescents exhibited more negative behaviors during discussions, including greater displays of negative affect and withdrawal, which would conceivably undermine the goal of conflict resolution. Notably however, participants had not been asked to resolve their conflict. Another study of adolescents, who either slept normally or extended their sleep by 30 minutes for 5 nights, included an in-lab social interaction task that required adolescents to modify their behavior to meet an explicit social goal (Reynolds & Alfano, 2022). Prior to a social interaction where teens were asked to “try to cheer up” an upset confederate peer, adolescents played a frustrating computer game to manipulate negative affect and emotions. Compared to the typical sleep group, adolescents who had extended their sleep reported more positive emotions and spoke more words during the social interaction, suggesting that sleep facilitated greater modification of behavior in support of a social goal.

Another recent investigation assigned adults to adequate or restricted sleep for 1 week followed by completion of a computer-based bargaining task with the goal of negotiating the cost of an item (Dickinson et al., 2022). The sleep-restricted group more often relied on a third party for negotiation (instead of negotiating themselves) to reach a solution. Although it is not entirely clear whether this result reflects a deficit in negotiation ability per se, results do suggest that inadequate sleep duration may result in less effortful approaches to reaching agreement.

Attentional Deployment

Regarding attentional processes, some studies suggest sleep loss biases attention toward negative/threatening emotional information, thereby undermining attentional deployment as a regulatory strategy—however, the nature and severity of sleep manipulation used, cognitive demands of the task performed, and type and intensity of emotional stimuli likely contribute to divergent results. Tasks that utilize emotional faces have produced some of the most consistent findings, typically showing that attention for threatening faces is maintained or increased following a period of sleep deprivation (Palmer & Alfano, 2017). Zhang et al. (2019) directly examined the effects of sleep deprivation compared to a night of normal sleep on various emotion regulation strategies, including distraction (i.e., adults were asked to think of unrelated thoughts or neutral scenes to feel “emotionally neutral” while looking at negative pictures). Participants reported that distraction was effective in regulating their negative emotions irrespective of sleep deprivation. The authors also examined the late positive potential (LPP) component of event-related potentials (ERPs) as a measure of attention to emotional stimuli and index of the effectiveness of distraction. LPP is considered a reliable marker of emotional processing, sensitive to emotion regulation manipulations (Hajcak et al., 2010). Compared to attenuated LPP amplitudes found among those using distraction after a night of normal sleep, distraction did not result in smaller LPP amplitudes in the sleep-deprived group, suggesting reduced effectiveness of this regulatory strategy following sleep loss.

Cognitive Change

Although cognitive reappraisal has received considerable investigation in the context of inadequate sleep, findings are somewhat mixed. Several experimental studies suggest that cognitive reappraisal ability and effectiveness are relatively resistant to the effects of sleep loss among both adolescents and adults. For example, in a recent study among young adults, the effectiveness of cognitive reappraisal was not impaired after a night without sleep based on both self-reports and neural responses (Shermohammed et al., 2020). Similar findings have been reported in adolescents restricted to 4 hours sleep for 1 night (Reddy et al., 2017). In contrast, Tamm and colleagues (2019) reported that partial sleep restriction decreased participant-reported effectiveness of cognitive reappraisal in adults, though corresponding alterations in neural responses were not observed. Conversely still, Zhang and colleagues (2019) found cognitive reappraisal was effective based on self-reports following a night of sleep deprivation—however, LPP amplitudes suggested reduced effectiveness of this strategy.

Equivocal findings require consideration of multiple factors, including sample sizes that may have been underpowered to find statistically significant group differences and variation in manipulations of both sleep and cognitive reappraisal across studies. Further, use and effectiveness of cognitive appraisal are moderated by age. Prior research has found that older compared to younger adults are less successful in using cognitive reappraisal to alter negative emotions, mediated in part by reduced activation in the prefrontal areas (Opitz et al., 2012). Conversely, for adolescents, cognitive reappraisal is generally used less frequently than among adults, and may therefore also be less successful at younger ages (Garnefski et al., 2002; McRae et al., 2012). Last, like all emotion regulatory strategies, effectiveness of cognitive reappraisal is likely influenced by multiple sleep parameters other than duration. For example, Mauss et al. (2013) found poor subjective sleep quality across 1 week to predict lower cognitive reappraisal ability during

a subsequent laboratory-based challenge, even after controlling for potential confounds, including age. In summary, cognitive reappraisal may be impaired by inadequate/poor sleep, but greater attention to the factors noted here help to clarify relationships.

Response Modulation

Alterations in response modulation in relation to sleep have most commonly been examined via suppression, including subjective and/or physiological arousal, facial expressions, and/or specific thoughts—however, even in the absence of explicit efforts to suppress emotion, sleep loss is known to dampen emotional expressions. For example, in both children and adults, diminished facial expressions of emotion and verbal utterances of emotional words are observable when sleep duration is shortened (Palmer & Alfano, 2017). Evidence for the effects of suppression on subjective and objective emotional arousal are more mixed, however. In the study by Zhang et al. (2019), self-reports of emotion and LPP amplitudes indicated that suppression was ineffective at reducing emotional responses in both rested and sleep-deprived conditions, aligning with evidence of increased activation of emotion-generative brain regions and a general failure of this strategy to decrease emotion responses (Goldin et al., 2008). Likewise, in a sample of school-age children asked to suppress their emotional responses to positive and negative movie clips, Alfano et al. (2020) reported increases in respiratory sinus arrhythmia (i.e., a physiological index of emotion dysregulation) during the task when children were sleep restricted compared to when rested, suggesting suppression was more taxing at an autonomic level when children were sleepy.

Suggested Directions for Future Research

Experimental research investigating causal relationships between sleep and emotion regulation continues to emerge, but several notable gaps provide direction for future studies. Perhaps most critically, few experimental studies conceptualize sleep health from a multidimensional perspective, despite burgeoning evidence that diverse aspects of sleep exert measurable effects on daytime functioning. Buysse's (2014) RU-SATED model emphasizes six essential dimensions of sleep health, including sleep regularity (i.e., low variability), subjective satisfaction, appropriate timing, adequate duration, high sleep efficiency, and sustained alertness during the day. Manipulation of some of these dimensions (e.g., satisfaction) is admittedly more challenging than others (e.g., duration), yet necessary in order to build an understanding of how real-world sleep patterns and emotion regulation interact to elevate risk for psychopathology.

Second, as compared to the impact of sleep on subsequent emotion regulation, experimental studies examining how different emotion regulatory strategies impact sleep are relatively nascent. The few experimental studies that have been conducted nonetheless indicate that maladaptive emotion regulatory strategies (e.g., rumination) may exert adverse effects on sleep. Such findings align with Harvey's (2002) cognitive model of insomnia, which emphasizes the role of rumination in the etiology of the disorder. Effects of other maladaptive forms of emotion regulation on sleep, such as avoidance and suppression, remain to be examined.

Another notable omission from experimental research is a focus on the regulation of positive emotional responses. Unlike negative emotional states, positive emotions broaden momentary thought-action repertoires and build social, physical, and psychological

resources that endure over time (Frederickson, 2001). It is also increasingly clear that sleep deprivation and restriction more profoundly impact positive than negative affective states (Tomaso et al., 2021), suggesting that the ability to up-regulate positive emotions may be particularly compromised when sleep time is deficient. Further, one recent study among young adults demonstrated that self-reported sleep quality, but not sleep duration, across 1 week was associated with greater reported use of positive emotion regulation strategies based on ecological momentary assessment (Parsons et al., 2022).

Finally, mixed subjective and objective outcomes are apparent for virtually all types of emotion regulatory strategies when sleep is deficient (in some way), rendering any conclusions tentative at best. Wide-ranging variability in experimental designs, including differences in emotional stimuli/tasks used, assessment setting (in lab vs. real world), and specific instructions provided to participants, surely contributes to equivocal findings. As such, there is a need to prioritize replication over novelty. Likewise, the role of development requires greater attention since both sleep and emotional processing undergo continuous alteration across the lifespan. Better understanding of how aspects of sleep intersect with emotion regulatory abilities at different stages of development holds potential for informing both etiological models, as well as early intervention efforts.

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CHAPTER 60

Culture, Emotion Regulation, and Physical Health

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Certain emotions and emotion regulation processes are linked to worse physical health (Kubzansky et al., 2014). For example, a considerable amount of research has linked negative emotions to risk for cardiovascular disease (Suls & Bunde, 2005). Furthermore, a growing literature has revealed the importance of emotion regulation strategies, especially maladaptive strategies, such as rumination and suppression, in undermining physical health, and adaptive strategies, such as reappraisal, with sustaining better physical health (e.g., Appleton et al., 2013; Zoccola et al., 2014). Yet, what determines which emotions or emotion regulation strategies are “maladaptive” or “adaptive” is likely to depend on sociocultural contexts.

Emotion regulation is the process by which people attempt to influence emotions. It involves both the identification of emotion goals and the use (selection and implementation) of specific strategies to accomplish such goals (Gross, 2015; Tamir et al., 2019). Cultural contexts can influence both emotion goals and specific strategies. These cultural contexts not only sculpt emotions and emotion regulation themselves but can also influence the physical health implications of emotions and emotion regulation.

In this chapter, we first present a conceptual model to help better understand how cultural contexts influence the links from emotions and emotion regulation to physical health outcomes. We then introduce two specific lines of research that illustrate how cultural contexts play a role in these connections. The first line of research focuses on cultural influences on the extent to which people *suppress* emotions and its association with physical health. The findings demonstrate how the link between emotion regulation strategies and health depends on cultural context. The second line of research focuses on cultural influences on how *negative emotions are construed and valued*, thus influencing emotion goals, which can moderate the physiological and health implications of negative emotions. We conclude by discussing some future directions for the cultural viewpoint

that broadens perspectives as we approach the study of the myriad connections between mind and body.

A Conceptual Model

Culture is historically derived and transmitted patterns of values and ideas that are embodied in institutions, practices, and tangible physical products, which are generated and sustained through behavior (Kroeber & Kluckhohn, 1952). Culture shapes psychological processes by defining what is deemed good, rational, and virtuous (Shweder, 2003). Through these processes, cultural context can influence a wide range of emotion regulation processes. Culture can (1) define which emotions are desirable or undesirable (or useful or harmful), thus setting emotion goals (Mauss & Tamir, 2014); (2) prescribe which strategies should be used to accomplish such goals; and (3) guide how effectively and easily each strategy can be implemented. Cultural differences in emotion regulation processes can have physical health implications. Experiencing and regulating emotions in a way that is congruent with a given cultural context has been theorized to lead to better physical health outcomes, whereas experiencing and regulating emotions in a dissonant manner incompatible with a given cultural context has been posited to be linked to worse physical health outcomes (Stephens et al., 2012; Yoo & Miyamoto, 2018). Figure 60.1 illustrates a conceptual model of how cultural factors can influence the links between emotions, emotion regulation, and physical health outcomes. While experiencing and regulating emotions in a culturally normative way is assumed to be associated with psychosocial resources (Yoo & Miyamoto, 2018), experiencing or regulating emotions in a culturally non-normative or incongruent way is likely to undermine the psychosocial resources needed to cope with situational demands and, instead, increase the perception of inadequate resources and threat (Folkman & Lazarus, 1985).

The perception of inadequate resources and threat can lead to worse physical health through both behavioral and physiological pathways. It can increase unhealthy behavioral responses (e.g., less physical activity, more drinking/smoking, disturbed sleep), which in turn can lead to worse physical health. It can also have direct physiological effects, such as activating the sympathetic nervous system (SNS) and the hypothalamic–pituitary–adrenal (HPA) axis. The SNS releases adrenaline and noradrenaline, which increases heart rate and blood pressure and decreases heart rate variability. The HPA axis releases cortisol, which has cascading effects on metabolism, protein synthesis, glucoregulation, and even the immune system. Although these hormonal responses are beneficial for mobilizing energy reserves to deal with acute stressors in everyday life, if they are activated for a prolonged period, they can lead to wear and tear on the body (called “allostatic load”), which results in longer-term changes in the cardiovascular, metabolic, and immune systems. These effects on our physiological systems result in increased risk for diseases, such as cardiovascular diseases, cancer, and infections (McEwen & Stellar, 1993), and even increased risk for all-cause mortality (Parker et al., 2022), which are the health endpoints.

Culture and Suppression of Emotions

The extent to which suppressing emotions is encouraged varies considerably across cultures (Matsumoto et al., 2008). In a cultural context where the self is defined in terms

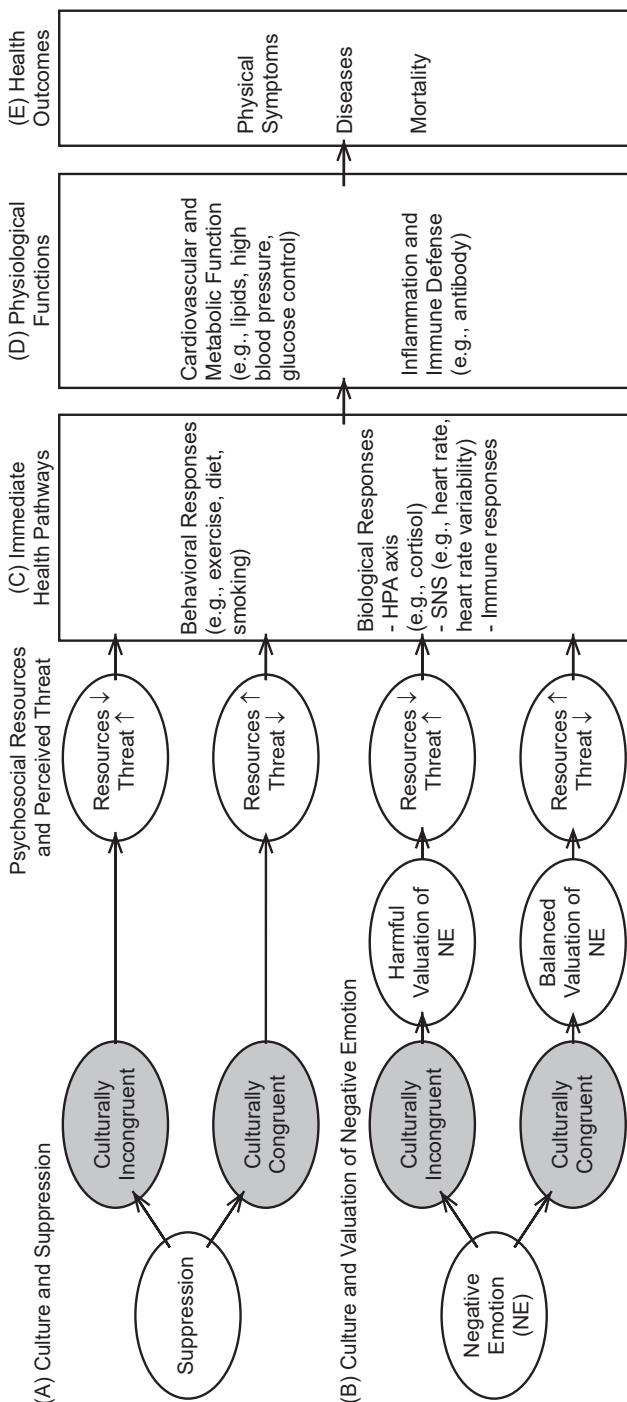


FIGURE 60.1. A conceptual model of how culture can influence the connections between emotions, emotion regulation, and physical health outcomes. (A) In Western cultural contexts, where suppressing emotions is culturally incongruent, suppression is more likely to reduce the psychosocial resources and increase perceived threat to deal with situational demands, compared to Asian cultural contexts, where suppression is culturally congruent. (B) In Western cultural contexts, where negative emotions are culturally incongruent and perceived to be predominantly harmful, negative emotions are more likely to exacerbate the perception of inadequate resources and threat, compared to Asian cultural contexts where negative emotions are culturally congruent and perceived in a relatively more balanced way. (C) The inadequate resources and threat can lead to immediate health pathways through behavioral and physiological responses to acute stressors. (D) When prolonged, these responses produce longer-term changes in the cardiovascular, metabolic, and immune systems. (E) These changes in physiological systems result in an increased risk for disease and mortality. HPA, hypothalamic-pituitary-adrenal; SNS, sympathetic nervous system.

of unique internal attributes separated from the social context (Markus & Kitayama, 1991), expressing one's internal thoughts and feelings is highly valued. On the other hand, in a cultural context where the self is considered to be fundamentally embedded in social relationships, adjusting oneself to fit the surroundings is emphasized. In such a cultural context, controlling and suppressing one's emotions is valued. In fact, a large-scale cross-cultural study found that, across 32 countries, more individualistic cultures tend to endorse higher emotion expressivity (Matsumoto et al., 2008).

In line with a cultural emphasis on emotional suppression, Asians and Asian Americans tend to report suppressing emotions more compared to European Americans (Soto et al., 2011). The findings are not limited to self-report; a neural indicator of emotion processing showed that Asian Americans were able to down-regulate emotional processing more when asked to suppress their emotional expression as compared to European Americans (Murata et al., 2013), suggesting that suppression is a more habitual emotion regulation strategy among Asians.

At the same time, suppressing emotion has been linked to various maladaptive outcomes, such as heightened physiological responses in Western cultures (e.g., Appleton et al., 2013), and has been considered an unhealthy strategy—however, cultural differences in the frequency and ease of suppression suggest a possibility that the negative effects of emotional suppression on physiological health may be attenuated in Asian cultural contexts where suppression is culturally more normative (and conversely may be exacerbated in Western cultural contexts where suppression is culturally not normative).

In fact, laboratory studies provide support for this notion. Higher levels of emotional expressivity during a conversation over an upsetting film were associated with lower blood pressure among European American dyads, whereas there was a trend for *lower* levels of emotional expressivity, which likely were the result of emotional suppression, to be associated with lower blood pressure among Asian American dyads (Butler et al., 2009). With regard to the effects of instructed suppression, while some studies found similar physiological responses across cultures during emotional suppression (e.g., Roberts et al., 2008), a more recent study found that suppressing emotions led to greater skin conductance reactivity during disgusting films compared to the baseline among European Americans but not among Asian Americans (Soto et al., 2016). Moreover, the importance people place on controlling emotions has been linked to divergent physiological outcomes across cultures. When responding to an anger provocation, the extent to which people believe that emotions should be controlled was associated with a threat pattern of cardiovascular response (e.g., lower cardiac output) among European Americans, but with a challenge pattern of cardiovascular reactivity (e.g., greater left ventricular contractility) among Asian Americans (Mauss & Butler, 2010).

While less research has directly examined cumulative effects of the daily use of suppression on long-term physical health outcomes across cultures, a recent study found that the self-reported use of suppression was associated with a *lower* level of somatic symptoms (e.g., stomach problems, back pain) among Japanese (with the exception of complaints about headaches), whereas they were not associated among German adults (Wolf et al., 2020). Such findings suggest the possibility that habitual use of suppression in a cultural context where it is normative might be associated with reduced physical symptoms.

At the same time, the health implications of expressive regulation can also depend on specific negative emotions, such as anger. In an American cultural context, where frustration is a major cause of anger expression, those who face frustrating events in daily life tend to express anger; on the other hand, in a Japanese cultural context, where anger is

strongly sanctioned, only those who have a privileged status can afford to express anger (Park et al., 2013). Presumably due to such differences in the experiences that underlie anger expression (i.e., frustrating events vs. privilege), anger expression was tied to more biological health risks (i.e., more inflammatory activity and poorer cardiovascular function) in the American cultural context, whereas it was associated with fewer biological health risks in Japanese cultural contexts (Kitayama et al., 2015).

Overall, these findings indicate the possibility that the act of suppressing emotions per se may not be inherently maladaptive but that cultural contexts and meanings may make them so. The presumed mechanisms underlying cultural influences should be further assessed in future research.

Culture and Valuation of Negative Emotions

It has been well documented that negative emotions are associated with adverse physical health outcomes, such as type 2 diabetes, hypertension, and inflammation (Suls & Bunde, 2005). Short-term physiological effects of negative emotions have also been well documented. For example, responding to a laboratory stressor task that elicits negative emotions leads to larger physiological responses, such as increased heart rate and cortisol (Kirschbaum et al., 1993).

At the same time, other studies have also shown that there are individual and situational variations in the physiological consequences of negative emotions, even in Western cultures. In particular, studies have shown the role of valuation/appraisal in the link between negative emotions and their physiological implications: construing negative emotions or states as beneficial has been shown to reduce the negative physiological responses to a stressor (Jamieson et al., 2012). Furthermore, among people who valued negative emotions, the link between daily experiences of negative emotion and physical health (e.g., the number of illness conditions and health complaints) was reduced (Luong et al., 2016). Such findings suggest that how people value negative emotions can moderate the short- and long-term effects of negative emotions on physiological health.

Notably, there is a growing body of literature showing how the valuation of negative emotions differs across cultures. While negative emotions tend to be viewed as predominantly undesirable and harmful in Western cultural contexts characterized by independence and analytical thinking, some positive aspects of negative emotions (e.g., motivational and cognitive utility) are also highlighted in East Asian cultural contexts characterized by interdependence and dialectical thinking (Miyamoto et al., 2014; Sims et al., 2015). From an East Asian cultural context, because of their view that negative emotions are relatively less harmful and the perception of some utility and gain for negative emotions, the adverse physiological health effects of negative emotions may be attenuated.

In fact, cross-cultural studies that compared the links between negative emotions and physiological bioindicators of health have repeatedly found the associations to be weaker or absent in Japanese adults when compared to American adults in the U.S. cultural context (Miyamoto et al., 2013). For example, American respondents who reported experiencing more negative emotions in their daily lives had higher levels of the proinflammatory cytokine, interleukin-6, in circulation and poorer cardiovascular function (i.e., higher systolic blood pressure), an association that was not evident in Japan. These cultural differences were partly explained by a hormone marker of dysregulation of the HPA axis—that is, only in the United States was there an association between negative

emotions and a flattening of the diurnal cortisol slope (i.e., lower morning, higher afternoon levels; Park et al., 2020).

Recent laboratory studies have started to reveal how the valuation of negative emotions may underlie these cultural differences. East Asian students were more likely than European American students to perceive the utility of nervousness, and this valuation was associated with lower reactivity and faster recovery of cardiovascular measures (i.e., heart rate, heart rate variability) to a laboratory stressor (Yoo et al., 2022). Another study examining cortisol responses to a Trier Social Stress Test (Kirschbaum et al., 1993) found that utility for nervousness was associated with a faster return of cortisol to normal baseline levels among European American students (Choi et al., 2023). These findings indicate that the links between negative emotions and both the autonomic nervous system (ANS) and the HPA axis can be attenuated by the valuation of negative emotions, which can be shaped by cultural contexts.

Whereas these findings indicate that cultural contexts can moderate the link between negative emotions and poor physiological health by providing different valuations of negative emotions and thus setting different emotion goals, the specific emotion regulation strategies employed to accomplish such goals need to be further explored. For example, it is possible that anticipating some perceived harm from negative emotions leads to engagement in emotional avoidance, whereas a perceived utility for negative emotions results in more acceptance of negative emotions.

Summary and Future Directions

In summary, both the maladaptive physiological effects of emotion suppression and the adverse physiological implications of negative emotions, which have been repeatedly found in Western cultural contexts, tend to be attenuated in East Asian cultural contexts where these emotion regulation strategies or emotions are more normative (or less non-normative). These findings illustrate how cultural contexts play a major role in the links between emotions, emotion regulation strategies, and physical health outcomes. It conveys the importance of taking cultural context into consideration when designating which emotions or emotion regulation strategies are “maladaptive” or “adaptive.”

There are many promising future directions to be explored. First, the psychosocial resources and perceived threat theorized to underlie this conceptual model (see Figure 60.1) need to be elucidated (Yoo & Miyamoto, 2018). Second, it is important to examine other types of emotions and emotion regulation processes. For example, given cultural differences in how people view rumination (Choi & Miyamoto, 2023), it is possible that the adverse physiological effects of rumination found in Western cultures (e.g., Zoccola et al., 2014) might be reduced in Asian cultural contexts. Third, our review focused primarily on physiological mediators, including hormones and inflammatory proteins, but what about the many behavioral pathways? While cross-cultural research on suppression and negative emotions typically highlights biological pathways, other research has examined the role of behavioral and life style processes, such as diet, in inflammatory activity (Coe et al., 2020). It would be equally fruitful to identify the type of emotion processes that lead to better health through behavioral pathways. Finally, we focused only on studies that compared Western and Asian cultural contexts. There is emerging literature examining cultural contexts beyond East versus West (Tamir et al., 2023). Investigating the full range of diversity and human potential across non-Western cultures will further

elucidate the role of cultural contexts in shaping the physical health implications of emotions and emotion regulation processes.

ACKNOWLEDGMENT

This work was supported by a grant from the National Science Foundation (No. 1918100).

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SECTION XIII

**SPECIFIC EMOTION
REGULATION
PROCESSES**

CHAPTER 61

Reappraisal

ANDERO UUSBERG
HELEN UUSBERG

Imagine reuniting after many years with a friend with whom you recall being so close that you often finished each other's sentences. You finally meet and start catching up only to discover that the connection you once felt is missing. There are awkward pauses and forced laughter. You feel very frustrated, at first. But then you decide to give the relationship more time. Maybe you just need to get used to each other after all those years? You also think that even if the connection never reappears, nothing will diminish the role your friend has already played in your life. As you develop these thoughts, you notice how your frustration abates.

This is an example of using reappraisal or changing thoughts about a situation in order to change emotions elicited by that situation. Compared to many common forms of emotion regulation, such as trying to avoid situations, thoughts, or feelings, reappraisal tends to be more effective in altering emotion across the body and the mind (Webb et al., 2012). Reappraisal use is also associated with higher resilience (Riepenhausen et al., 2022) and better mental health (Aldao et al., 2010; Gross & John, 2003). This is not only because good mental health facilitates reappraisal but also because using reappraisal improves mental health (e.g., Brewer et al., 2016; Lincoln et al., 2022). For these reasons, reappraisal is often seen as a particularly adaptive form of emotion regulation.

In this chapter, we consider the cognitive mechanisms that make reappraisal possible and effective. The fact that thoughts can be altered in the service of emotions can seem puzzling. Our cognitive system strives to represent the world as it is and thus a healthy mind cannot easily engage in emotionally comforting misperceptions. Therefore, a fundamental goal for reappraisal research is to understand how our minds generate emotionally desirable but nevertheless generally rational cognitive changes. Here we address this goal by summarizing the *reAppraisal* framework designed for charting the cognitive mechanisms of reappraisal (Uusberg et al., 2023, 2019).

The ReAppraisal Framework

Building on the process model of emotion regulation, the reAppraisal framework defines reappraisal as *intentional adjustment of the appraisal component of emotion* (Gross, 2015; Gross, this volume). Emotion can be seen as a system of interacting responses to a situation across the mind and the body (Moors, 2022; Mulligan & Scherer, 2012). These responses or components of emotion include physiological changes, such as increased cardiovascular effort; expressive behaviors, such as a frown; action tendencies, such as a goal to remove an obstacle; and conscious feelings, such as frustration. Emotion components also include appraisal, or the cognitive and often automatic encoding of what a situation means for salient goals (Moors et al., 2013; Scherer et al., 2001). For instance, not connecting with an old friend may be appraised as a serious social loss. Although other theoretical positions are possible (Moors, 2013), we consider appraisal to be the primary instigator of changes in the rest of the emotion system (Scherer & Moors, 2019).

The pivotal position of appraisal makes its adjustment an effective avenue for regulating emotion. For instance, thinking that a connection with an old friend might still reappear can change the motivational meaning of the situation from being a serious loss to a transitory challenge. This change in appraisal can in turn lead to a change in emotion, such as the abating of frustration. Appraisal adjustment counts as reappraisal only if it is initiated by an *emotion goal*, such as to feel less frustrated (Gross, 2015; Tamir, 2015; Tamir & Hu, this volume). The involvement of an emotion goal distinguishes reappraisal from spontaneous appraisal change that is spurred by new information about a situation or evolution of the situation itself.

We suggest that rather than recruiting dedicated appraisal change processes, reappraisal simply adjusts the processes involved in forming and updating of appraisals (Everaert et al., 2021). Learning more about these processes is thus a good way to understand the cognitive mechanisms of reappraisal. Following this approach, the reAppraisal framework suggests that appraisals can be changed by adjusting either the way a situation is construed in a strategy we call *reconstrual*, or by adjusting the goals the construal is related to in a strategy we call *repurposing*. If successful, both kinds of adjustments result in *shifts along abstract appraisal dimensions*, such as changes to how relevant, congruent, or controllable a situation is appraised to be (see Figure 61.1). As appraisal shifts lead to changes in the remaining components of emotion, the process of changing emotion by changing thoughts is complete. Next, we consider each of these steps in more detail.

Reconstrual and Repurposing

An output of a process such as appraisal can be changed by changing the inputs to that process. The inputs to the appraisal process are a *construal representing how a situation is* and a *set of salient goals representing how it is desired to be* (Moors, 2010; Reisenzein, 2009). For instance, appraising a meeting as a social loss may arise when a situation construed as “a failure to connect” is related to a salient goal of “reconnecting with a friend.” A different construal or a different goal would lead to a different appraisal. For instance, the meeting may be appraised as only a temporary setback when it is construed as “a natural warm-up” rather than “a failure to connect.” A similarly benign appraisal may arise even when the situation remains construed as “a failure to connect,” as long as that construal is related to a goal it aligns with, such as “to find out quickly if reconnecting with the friend is possible.” Reappraisal involves adjusting the construals and/or

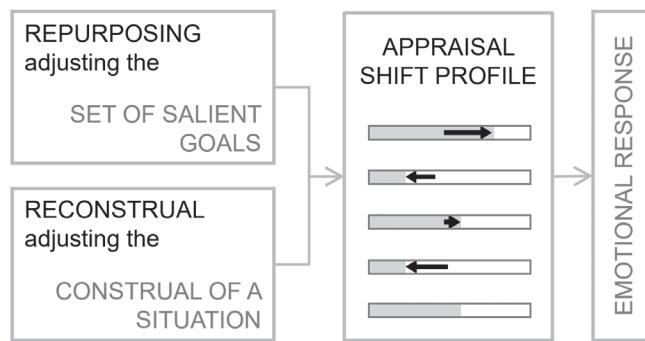


FIGURE 61.1. The reappraisal framework. Reappraisal can be defined as the intentional adjustment of the appraisal component of emotion. This can involve adjusting the way a situation is construed (reconstrual) or the saliency of the goals that are used to evaluate the construal (repurposing). Both adjustments can produce shifts along appraisal dimensions that lead to changes in the emotional response.

goals in order to bend the appraisal they feed into toward emotion goals (Uusberg, Ford, et al., 2023).

Reconstrual involves adjusting the way a situation is construed. We view construals as hierarchical mental models that integrate sensations and beliefs about a situation (Gilead et al., 2020). Often, motivationally meaningful aspects of situations, such as the mental states of others, cannot be directly observed. Construals are thus to a varying degree inferences that combine observable information with prior knowledge (de Lange et al., 2018). For instance, the construal of a meeting with a friend as “a failure to connect” may reflect an inference drawn from limited pieces of observable information, such as long pauses and awkward laughter. Usually, it is the inferences involved in construal that can be adjusted during reconstrual. For instance, someone reappraising the situation can wonder what else awkward laughter may signify, or collect more information about the true level of connection.

Repurposing involves changing the goals that the situational construal is related to. Goals are representations of aspects of situations that a person seeks to approach or avoid (Elliot & Fryer, 2008). Goals range from relatively concrete objectives, such as “to meet with a particular friend” to increasingly abstract norms, values, and needs, such as “to affiliate.” Goals also vary in salience or the motivational impact they have at a given time on the rest of the mind, including the appraisal process (Huang & Bargh, 2014). Thus, appraisal depends on which goals are sufficiently salient to take part in evaluating the situational construal. For instance, the goal “to reconnect with a friend” may be more salient during a long-planned meeting than during a serendipitous encounter. Usually, it is the salience of different goals that can be adjusted during repurposing. For instance, when faced with a rocky meeting, the salience of the initial goal “to reconnect” may be reduced while alternative goals, such as “to appreciate the role of that friend in the past” or “to grow as a person from facing a difficult emotional challenge,” gain salience.

The notions of reconstrual and repurposing explain how reappraisal can arise from a broadly rational mind. Both strategies can be effective without introducing misperception, as long as there is more than one realistic construal and more than one adaptive set of salient goals. For instance, given that long pauses can signify both a natural warm-up and a failure to connect, adopting the former construal over the latter can lead to

emotional improvements without compromising realism. Likewise, given that a failure to connect with a friend can be congruent with appreciating the role the friend has played in the past, as well as incongruent with reconnecting with them now, committing to the former goal over the latter can lead to emotional improvements without compromising adaptive motivation. Even though reappraisal can at times involve irrational cognitive changes, our framework suggests that it typically operates within the realm of rational construals and goals.

Reconstrual and repurposing can be equally effective in regulating emotion. In a unique collaborative study, over 20,000 participants from 87 countries and regions viewed images depicting different distressing aspects of the COVID-19 pandemic (Wang et al., 2021). They were randomized to view the images following either one of two control instructions or following instruction to use reconstrual or repurposing. Compared to both control conditions, both reconstrual and repurposing reduced negative emotions and increased positive emotions not only in relation to the images but also in relation to the pandemic more broadly.

Less is known about the antecedents of reconstrual and repurposing. On conceptual grounds, reconstrual should be easier when the situational construal is malleable because it relies heavily on inferences rather than observable information (Uusberg et al., 2019). For instance, construing a long pause in a conversation as a sign of a warm-up is easier on the first compared to later meetings with an old friend. Similarly, repurposing should be easier when the set of salient goals used for appraising the situation is malleable because the situation is potentially relevant for different goals. For instance, appreciating the connection you once had with somebody to compensate for not connecting with them now is easier if that person has indeed played a significant role in your life. Thus, the malleability of construals and goals may be an important aspect of reappraisal affordances (Suri et al., 2018; Suri, this volume).

The malleability of construals and goals varies not only with the situation but also with the person. For instance, affordances for reconstrual may depend on trait intolerance of uncertainty. Someone disposed to avoiding uncertainty may find it challenging to consider multiple interpretations of the same situation, leading to reduced use of reappraisal (e.g., Shu et al., 2022). Affordances for repurposing may likewise depend on the ability to consider alternative goals. Vulnerability to depression has been associated with limited malleability of important goals (Street, 2002), which may partly explain the difficulties people at risk for depression face with reappraisal (Lincoln et al., 2022).

Profile of Appraisal Dimension Shifts

Reconstrual and repurposing are useful concepts for *explaining* how reappraisal arises from intentional adjustments of the inputs to the appraisal processes. The next challenge is to *describe* the wide range of specific adjustments to construals and goals that people can make across different situations. The reappraisal framework addresses this challenge by considering the output of the appraisal process: the representation of the motivational meaning of a situation that can be described with a small set of appraisal dimensions.

Appraisal dimensions represent some aspect of how a situation as construed relates to salient goals. A sufficient set of appraisal dimensions is unknown, but five dimensions appear necessary to distinguish commonly experienced emotions (Moors et al., 2013). Expressed as a question about the motivational meaning of a situation, these include (1) relevance: how much the situation matters for salient goals, (2) congruence: how well the

situation aligns with these goals, (3) accountability: how much of the responsibility for the situation lies with oneself relative to other individuals and causes, (4) control: how easy it would be to change the situation, and (5) certainty: how clear the situation and its implications are.

Appraisal dimensions succinctly characterize variance in motivational meaning much like the dimensions of red, green, and blue (RGB) succinctly characterize variance in color in the RGB system. We suggest that the variance in reappraisal can be equally succinctly characterized by *shifts along appraisal dimensions*. Specifically, an instance of reappraisal can be expressed as a profile of shifts along appraisal dimensions that collectively capture how motivational meaning changes from before to after reappraisal. For example, thinking that a connection with an old friend might need time to reappear may reduce the certainty appraisal, as well as increase the congruence and controllability appraisals as the implications of the situation become less clear, less problematic, and more controllable, respectively.

If appraisal shifts can capture the substance of reappraisal, they should statistically mediate the impact of reappraisal on emotion. This is indeed what we have found (Uusberg et al., 2023). Participants reported how they appraised and felt about recent distressing events before as well as after using reappraisal. We found that up to half of the reappraisal-related changes to emotions were statistically mediated by shifts along different appraisal dimensions. In a replication with ecological momentary assessments, we found that appraisal shifts explained a similar proportion of the differences between emotional reactions assessed within an hour of an event and emotional reactions to the same event assessed later in the evening, but only when participants had used reappraisal in the interim.

Appraisal shift profiles promise to capture the substance of reappraisals without the costs associated with measuring and analyzing their full idiosyncratic content. This is because such profiles can be sensitive to a range of different reappraisals. First, appraisals can be shifted both by reconstrual and by repurposing. For instance, the appraisal of awkward pauses can become less incongruent both when you reconstrue pauses as a sign of a natural warm-up, as well as when you realize that a pause-free conversation is not actually a reasonable goal in a meaningful relationship. Second, reappraisals can shift a single dimension, as well as multiple dimensions. For instance, blaming your friend for conversation troubles would shift only the accountability appraisal, whereas blaming your friend and also thinking they'll probably do better next time would shift the accountability, as well as relevance appraisals. Third, reappraisals can shift appraisal dimensions in either direction. For instance, some people may increase the control appraisal by focusing on future opportunities to reconnect with the friend, whereas others may decrease the same appraisal by letting go of things beyond their control. Finally, appraisal shifts can reflect adjusted motivational meaning of both the physical and the mental aspects of a situation. For instance, the appraisal of awkward pauses can be shifted higher on the congruence dimension by thinking that the pauses are part of a warm-up (reconstruing a physical aspect of a situation), as well as by thinking that they probably loom overly large in my mind because I'm a little nervous (reconstrual of a mental aspect of a situation).

Appraisal shifts could evolve into a consensual coordinate space for mapping and understanding the diversity of reappraisal. Existing lists of reappraisal tactics seem translatable to a profile of appraisal shifts (e.g., Garnefski & Kraaij, 2007; McRae et al., 2012). For instance, of the reappraisal tactics observed in picture-based experiments (McRae et al., 2012), "change future consequence" may involve increasing congruence without increasing control, whereas "agency" may involve increasing congruence, as

well as control. Using a consensual set of appraisal dimensions, researchers could over time identify robust clusters of appraisal shift profiles that can be considered common reappraisal tactics. Appraisal shift profiles could also facilitate research into the causes and consequences of reappraisal. Using shift profiles as dependent variables, researchers could ask which reappraisals are easier to generate in different kinds of situations and for different kinds of people. Using profiles as independent variables, researchers could also ask which reappraisals are most helpful in the short and long term, again in different situations and for different people.

Having reached the boundaries of what is known about reappraisal is a good place to draw this chapter to a close. We have used a pair of observations about the appraisal component of emotion to improve our understanding of the cognitive mechanisms involved in reappraisal. Reappraisal can arise from intentional adjustment of the inferences involved in how situations are construed (reconstrual), as well as from intentional adjustment of the relative salience of the goals used to evaluate such construals (repurposing). The resulting changes to the motivational meaning of a situation can be succinctly characterized as a profile of shifts along appraisal dimensions, such as relevance, congruence, accountability, control, and certainty.

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CHAPTER 62

Expressive Suppression

UNDERSTANDING THE REGULATION OF EMOTIONAL BEHAVIOR

TAMMY ENGLISH

When people hear the term *emotion regulation*, attempts to control one's inner feelings usually come to mind. However, many of our regulatory efforts are directed toward managing the emotions that we outwardly express. This chapter focuses on the most commonly studied strategy for managing the emotions we communicate to others—namely, expressive suppression. Historically, expressive suppression has been portrayed as a maladaptive method for managing emotion, deemed ineffective and effortful given that it intervenes late in the emotion-generative process (Gross, 1998). However, recent work has shifted toward understanding the utility of expressive suppression in the context of individuals' goals and broader regulatory demands in day-to-day life. Taking an interpersonal perspective that considers the social functions of expressing and concealing emotion has proven particularly useful for understanding this inherently social strategy. In this chapter, I first define expressive suppression and describe when it is most likely to be used to manage one's emotion. Then I highlight key findings about the consequences of expressive suppression and end with a discussion of important next steps in this area of research.

What Is Expressive Suppression, and When Is This Strategy Used?

Expressive suppression involves attempts to inhibit the behavioral aspect of an emotion that one is currently experiencing (Gross, 1998). For example, if someone is feeling sad, then they might try not to frown, cry, or slump. It is the most commonly studied response-focused strategy, often used as a foil against cognitive reappraisal (i.e., changing the meaning of an emotional stimulus). However, there are other ways that one can try to manage ongoing emotion, including attempts to suppress the experiential or physiological

aspects of emotion through, for example, physical exercise or drinking alcohol. Notably, expressive suppression is not simply the opposite of emotional expression. Individuals vary in expressivity, or how much their inner experience of emotion is naturally reflected in their expressive behavior. The absence of outward cues of emotion could indicate that the person (1) is not currently experiencing any emotion, (2) is experiencing emotion and not trying to manage their expression (i.e., low expressivity), or (3) is trying to conceal the emotions that they are experiencing. Only the latter case would be considered expressive suppression.

When allowed to be freely expressed, emotions can serve as important social signals, communicating our inner experience to interaction partners and strengthening social bonds (Keltner & Haidt, 1999). However, there are times when we may want or need to intervene to manage our emotional expressions. Display rules (Ekman & Friesen, 1969) provide guidelines for expression norms in specific settings within a culture (e.g., laughing at a funeral may be discouraged). Expressive suppression can be a useful strategy to meet these standards when individuals feel contextually inappropriate emotions or when they are uncertain whether their emotional disclosures will be well received (Greenaway & Kalokerinos, 2017).

Research on factors underlying the use of expressive suppression has delineated both contextual and person-related predictors. Although individuals can attempt to inhibit their expressions when alone, expressive suppression is typically used in social situations. Experience sampling of daily life has revealed that expressive suppression is particularly prevalent when interacting with nonclose others (English et al., 2017) and in situations where the regulator perceives themselves to be lower in social power (Catterson et al., 2017). Rather than being hedonically driven (e.g., by the desire to feel good), expressive suppression seems to be more tied to instrumental, socially oriented motives. Specifically, people often conceal their emotions for self-protective reasons, such as impression management (e.g., to seem competent and in control; Eldesouky & English, 2019) and to avoid social rejection (Thomson et al., 2018). Similarly, work on personality and individual differences has shown that expressive suppression is more likely to be deployed by those low in extraversion, high in attachment avoidance, and low in self-esteem (Gross & John, 2003). Overall, existing findings align with the idea that expressive suppression is a relatively more interpersonal strategy linked to social concerns.

What Impacts Does Expressive Suppression Have on Our Lives?

The bulk of research on expressive suppression has focused on its short-term effects in laboratory-based experiments where participants are instructed to not show any indication of emotion while viewing emotional images or film clips (e.g., Gross, 1998). There is a growing body of research examining short-term effects in daily life using experience sampling methods and individual differences work that can speak to potential longer-term effects of habitually using expressive suppression. Across these approaches, expressive suppression typically has been found to have negative intrapersonal and interpersonal consequences. Recent work, however, has begun pointing to situations where inhibiting expressions might be useful.

In terms of emotional outcomes, expressive suppression is quite effective at reducing the expression of emotion (Webb et al., 2012), but it does not typically change emotional experience (Kalokerinos et al., 2015). Experimental work has documented the physiological and cognitive costs of concealing one's emotions, such as heightened sympathetic

activation (Gross, 1998) and memory impairments (Richards & Gross, 1999). Similar effects also emerge outside of laboratory contexts. For example, displaying emotions that one is not feeling at work (often referred to as *surface acting*) is emotionally exhausting and can lead to worse task performance, as well as greater intentions to quit one's job (Grandey & Sayre, 2019). Experience sampling designs have documented fluctuations in how much people use expressive suppression across situations in their daily life, finding that emotional well-being is lower at times when this strategy is deployed (Brans et al., 2013). These short-term effects of concealing one's emotions can accumulate over time to create additional difficulties. Individuals who chronically use expressive suppression often have lower psychological well-being (Gross & John, 2003), as well as greater psychopathology (Aldao et al., 2010) and worse physical health (Mauss & Gross, 2004).

Expressive suppression also has a range of social costs (Chervonsky & Hunt, 2017). For example, concealing one's emotions interferes with interpersonal coordination in previously unacquainted dyads (Butler et al., 2003), as well as among romantic partners (Thomson et al., 2018), and habitual use of expressive suppression predicts declines in the closeness of social ties (English et al., 2012). Beyond impacts on the regulator, interaction partners experience greater distress, as well as less intimacy and satisfaction with individuals who conceal their emotional expressions (Butler et al., 2003; Impett et al., 2012; Peters & Jamieson, 2016). Individuals engaging in expressive suppression also tend to be seen as having more negative personality characteristics (e.g., disagreeable, avoidant; Tackman & Srivastava, 2016). These effects emerge despite expressive suppression being difficult for observers to detect. Romantic partners are somewhat accurate in judging their partner's trait-level expressive suppression, but judgments during interactions are biased toward assuming that partners use similar levels of suppression as oneself (Elde-souky et al., 2022).

There are at least three reasons that expressive suppression impacts functioning, and these mechanisms highlight ways in which concealing emotion can be either problematic or valuable. First, use of expressive suppression has been shown to effectively reduce emotion expression, so any effects of communicating these felt emotions to others (whether they are positive or negative) will be reduced or eliminated. Social sharing of emotion is a complex process with relational and cognitive components that can serve to strengthen interpersonal connections and help process emotions (Rimé et al., 2020). Although social sharing can be useful (e.g., when it facilitates the elicitation of needed support), there are also times when it can be helpful for someone to not let on how they are truly feeling (e.g., when it prevents unnecessary conflict escalation).

Second, expressive suppression does not reduce emotional experience, so use of this strategy results in a mismatch between inner feelings and outward behavior. Accordingly, individuals who use expressive suppression often feel inauthentic (English & John, 2013) and are perceived as inauthentic by others (Impett et al., 2012), which can arouse negative emotion and undermine trust in suppressors. Certain cultures, however, encourage the use of expressive suppression to maintain social order and are more accepting of discrepancies between behavior and experience (Wei et al., 2013).

Third, there are cognitive demands associated with expressive suppression that can deplete the resources necessary for pursuing other goals. The implementation of expressive suppression requires cognitive control to inhibit the impulse to express emotions and to monitor ongoing expressive behavior (i.e., facial expression, body language, tone of voice; Pruessner et al., 2020). Intense emotions are particularly difficult to conceal, as evidenced by work showing greater unintentional emotional leakage or behavioral cues (e.g., blinking; Porter et al., 2012). When engaged in expressive suppression, attentional

resources are divided so regulators are less able to track the details of conversation and respond appropriately to their partners (Butler et al., 2003). Expressive suppression may be less demanding, however, when individuals have developed more expertise managing expressions, if they are lower in expressivity, or at times when trying to inhibit emotions that are lower in intensity.

Promising Ways to Expand Our Understanding of Expressive Suppression

Research on expressive suppression has illuminated significant issues about managing emotions, expanding the way in which emotion regulation is conceptualized and studied to move beyond traditional approaches that centered on individuals managing their own emotions in isolation. In this last section, I describe four promising directions for future research: (1) modeling how expressive suppression unfolds over time, (2) further delineating the value of expressive suppression, (3) incorporating other expression-based strategies, and (4) exploring extrinsic use of expressive suppression.

Emotion regulation is a dynamic process that often includes multiple iterations of selecting strategies, implementing them, and monitoring their effects in order to reach one's goal (J. J. Gross, 2015). Despite the wide range of costs associated with expressive suppression, people report using this strategy relatively often in daily life (Brans et al., 2013). Given that expressive suppression targets the display of emotion, sociocultural factors play a large role in determining when this strategy is deployed (as well its impact; Wei et al., 2013), as noted earlier. However, other motivational, affective, and cognitive factors are also likely relevant determinants. One reason regulators may try to conceal their emotions is that, especially for high-intensity emotions, expressive suppression can be perceived as easier to use than more cognitive-based strategies, such as reappraisal (Kalokerinos et al., 2015). If that is the case, expressive suppression could serve as an initial stopgap that allows regulators some time and space to enact more complex cognitive-based strategies, if they want to effectively change their emotional experience. Designs that allow for observing and modeling the complex, dynamic nature of emotion regulation are needed to better delineate when expressive suppression is used and whether effects vary across distinct strategy sequences or combinations (e.g., when suppression is followed by reappraisal).

Another important next step is to better understand when expressive suppression is most useful and how it can be implemented successfully. Research on expressive flexibility suggests that the ability to effectively inhibit one's emotional expression is important for adjustment (Bonanno et al., 2004)—that is, although frequent and indiscriminate use of expressive suppression is costly, being able to conceal one's emotions when necessary is a useful skill. The relevant resources underlying the development of expressive suppression skills are yet to be determined, but cognitive control and social awareness are promising candidates (Gross & Cassidy, 2019). Experience sampling designs can help isolate the conditions under which expressive suppression is more appropriate and effectively deployed. For example, expressive suppression may be better received by interaction partners who have more benevolent perceptions of the suppressor's motives (Coté, 2005) or in contexts where emotional restraint and interpersonal harmony are highly valued (e.g., East Asian cultures; Wei et al., 2013). Given the profile of outcomes associated with expressive suppression, this strategy may be best suited for situations where regulators want to leverage functions associated with emotion (e.g., motivational benefits of anger),

but protect themselves from the costs of displaying emotion (e.g., relational conflict). When exploring these ideas, measures of emotion regulation success need to account for the fact that the primary goal of expressive suppression (unlike many other strategies) is to conceal the display of emotion, rather than change experience (Greenaway et al., 2021), and often this is done in the service of a particular social motive (e.g., to avoid conflict; Eldesouky & English, 2019). Effectiveness of expressive suppression, therefore, cannot simply be reduced to emotional experience, but rather needs to incorporate behavioral data, observer reports, or other goal-relevant outcomes.

Expressive suppression has typically been operationalized as *neutralizing* expression or trying not to show any emotion whatsoever, but there are other ways that one can attempt to manage their emotional expression (Ekman & Friesen, 1969). Regulators can try to display an emotion that is different from the one currently being felt (*masking*; e.g., putting on a happy face when irritated at work), initiate the expression of an emotion when feeling nothing (*simulating*; e.g., feigning excitement about your friend's mundane story), or try to increase the expression of a felt emotion (*amplifying*; e.g., making sure your child knows how proud you feel about them). More work is needed to understand when, where, and why these other types of expression-based strategies are used, as well as how their effects compare with expressive suppression (Kunzmann et al., 2005; Porter et al., 2012). From an emotion regulation flexibility perspective, each of these strategies can be useful if deployed in the right context and implemented effectively (Greenaway & Kalokerinos, 2017). That is, expression or suppression of emotion is not inherently good or bad, but rather their utility depends on the individual, situation, and their interaction. For example, observers' perceptions of the authenticity and motivation underlying expressions likely plays an important role in determining the consequences of these different expression-focused emotion regulation tactics.

Finally, emotion regulation can be used not only to manage one's own emotions (intrinsic processes) but also to manage the emotions of someone else (extrinsic processes; Zaki & Williams, 2013). Although there is an extensive literature on intrinsic use of expressive suppression, little is known about when people encourage others to conceal their emotions and the effects of extrinsic expressive suppression. Some initial insight into these issues may be gleaned from the emotional labor literature that has documented largely adverse effects of employers encouraging workers to hide their negative emotions in order to create a more positive experience for their customers (Grandey & Sayre, 2019). Extrinsic expressive suppression may be perceived as stifling and dismissive, which could create interpersonal difficulties and lower the target's self-worth. Emotion socialization in children may provide some clues into contexts in which encouraging expressive suppression is more or less useful (Gross & Cassidy, 2019).

Conclusion

Expressive suppression is often called upon to align our emotional behavior with perceived expectations, protect ourselves from vulnerability, and facilitate positive interactions. While habitual and inflexible use of this approach can backfire, leading to feelings of inauthenticity, negative social evaluations, and reduced intimacy, being able to effectively draw on expressive suppression when it aligns with one's goals and resources is expected to be beneficial. By leveraging interpersonal perspectives on emotion and emotion regulation, researchers can gain novel insight into issues regarding the management of emotional expression.

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CHAPTER 63

Distancing

WHAT IT IS, HOW IT WORKS, AND WHERE TO GO NEXT

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There has never been a moment when, at least in public,
[Barack Obama] seems gripped by inner turmoil. . . .

At every challenging moment, his instinct was to
self-remove and establish an observer's perspective. . . .

—DAVID BROOKS (2008)

The ability to “step back” to reflect on one’s circumstances from a more objective perspective has been touted as a desirable human attribute that aids emotion regulation throughout history and across disparate philosophical traditions (Herold et al., 2020; Trammel, 2017). Yet, it is only within the past 20 years that scientists have begun to rigorously evaluate this claim, providing evidence linking the general process of “stepping back” with adaptive emotion regulation outcomes (see Kross et al., 2023, for a review). For example, the largest meta-analysis to date on this topic demonstrated that a medium-size effect characterizes the impact of distancing on emotional reactivity (Moran & Eyal, 2022) and several studies have linked distancing with causal increases in people’s ability to reason wisely about difficult social dilemmas (e.g., Grossmann et al., 2021).

But as is often the case in new areas of work that bring together scientists from different areas, the groundswell of research on this process has also created confusion. Is distancing an avoidance tactic that should be shunned? Or is it simply another word for reappraisal or mindfulness? Does distance refer to one tool or many different tactics? And when we talk about distance are we referring to a specific tool people use to manage their emotions or a more general psychological process? Our main goal in this chapter is to address these and a host of related questions to explain what distancing is and what it isn’t to help guide future research. Before wading into these questions, however, we begin by addressing what is perhaps the most fundamental question of all: What is distancing?

Distancing: Definition and Relationship to Other Emotion Regulation Concepts

We human beings possess the ability to shift perspectives. We can reflect on our circumstances from alternative points of view. Distancing refers to a specific type of perspective shift that involves moving away from the narrow, self-immersed first-person point of view through which we typically experience life to adopt a broader perspective. As we explain in more detail below, there are many ways to cultivate this perspective shift. Some tools directly manipulate people's perspective (e.g., using the word *you* generically to refer to the self; adopting a third-person visual perspective; thinking about how one's actions will impact the person over time rather than in the here and now), while others activate distancing indirectly (e.g., experiencing the emotion of awe leads to a shrinking of the self; expressive writing leads people to adopt a more objective perspective when they think about their circumstances). The common theme between these different routes of inducing distance is that they involve a broadening of one's perspective beyond a self-centric, here-and-now framework.

One question that often arises about distancing is whether it is synonymous with avoidance, a process that has long been vilified as an emotion-regulatory tool that is detrimental to healthy functioning (e.g., Foa & Kozak, 1986). The key difference between avoidance and distancing concerns the focus of attention. Distancing involves shifting the perspective people adopt when focusing on an experience; it does not involve changing the object of attention. Thus, in a distancing experiment half of participants might be asked to focus on how they feel after a rejection experience right now (i.e., immersed condition) versus a week from now (i.e., distanced condition). In both cases, the focus of attention is on the rejection experience. The difference is the perspective from which they're focusing on this element of their history. Avoidance, by contrast, involves focusing one's attention on another facet of one's experience, or on a different experience altogether (see Kross et al., 2012, for a discussion).

Another question concerning distancing is how it relates to *reappraisal*, a term that is commonly used to refer to a specific emotion regulation strategy (e.g., Gross, 1998), as well as a general process that involves changing the way one thinks about their circumstances (Kross & Ayduk, 2017). To the extent that shifting from an immersed to a distanced viewpoint involves changing one's perspective, distancing *de facto* involves reappraising. Indeed, a large amount of research indicates that when people adopt a distanced perspective, either because they are asked to do so in the context of experiments or because they do so spontaneously, they change how they think about their circumstances. That said, there are a potentially infinite number of ways one can reappraise a stimulus, and many commonly studied strategies of this sort (i.e., positively reinterpreting a stimulus) differ substantively from distancing (e.g., Webster et al., 2022).

The issue of how distancing relates to mindfulness also comes up frequently. Mindfulness is a multifaceted construct, encompassing multiple psychological processes, one of which is "decentering": the act of mentally stepping outside of the self and recognizing one's thoughts and feelings as processes happening in the mind, not as true reflections of reality (e.g., Moore et al., 2022). As such, decentering invokes the process of distancing, but typically additionally involves having people adopt a nonjudgmental nonreactive attitude toward how they relate to inner mental events (see Ayduk & Kross, 2018, for a more detailed discussion). Among other processes involved in mindfulness are present-focus awareness and cultivation of acceptance, as well as engaging in particular practices such as focusing attention on momentary bodily experiences, breathwork, and mantra

recitation. Thus, mindfulness is a broader and more heterogeneous construct than distancing (e.g., Baer, 2016).

Distancing as an Emotion Regulation Process

In an early article published on cognitive therapy, Aaron Beck (1970) suggested that distancing was a key mechanism that enables therapeutic change. The idea he advanced was that distancing was a necessary precondition for a client's ability to reframe how they think about aversive experiences. Beck's discussion of distancing differs markedly from the way many researchers have since studied this construct. The bulk of research in this space conceives of distancing as an emotion regulation *tool*, a type of psychological lever that can be pulled to help people manage their emotions. Beck's discussion by no means precludes distancing functioning in this capacity. It additionally suggests, however, that distancing functions as a condition that allows people to successfully implement cognitive reframing operations.

Far less research has tested Beck's (1970) thesis in the intervening years compared to work examining the role that distancing plays as a tool to promote emotion regulation. Yet, evidence has begun to accumulate supporting his assertion. For example, people's attempts to cognitively work through negative experiences typically elicit rumination when done from a first-person perspective—however, engaging in the same cognitive operation from a psychologically distanced perspective reduces emotional reactivity, leads to cognitive change, and adaptive meaning making over time (see Kross & Ayduk, 2017, for a review).

Beyond examining the role that distancing plays as an enabling condition that promotes cognitive change, researchers have also begun to examine whether distancing functions as a central process, or mediating mechanism in statistical terms, that explains how various cognitive interventions have their benefits. For example, researchers have found that psychological distancing partly explains how several cognitive interventions promote emotion regulation, including expressive writing (Park et al., 2016), reappraisal (Nook et al., 2017), mood disorder treatment (Bennett et al., 2021), and mindfulness interventions (e.g., Moore et al., 2022).

As we discuss below, accumulating evidence also suggests that distancing may play a role in explaining the benefits of additional behavioral strategies. For example, growing research suggests that the psychological mechanism that explains the impact of awe on prosocial outcomes (e.g., ethical decision making, generosity) is the “shrinking of the self”—a perspective shift in which one feels smaller when contemplating the vastness of an experience and the primacy one's egocentric concerns are diminished (Piff et al., 2015). Distancing may also play a role in partly explaining how rituals work (Hobson et al., 2018). In this vein, researchers speculate that one of the ways rituals improve emotion regulation is by helping people broaden their perspective, bringing them in touch with forces that are larger than themselves. Finally, the large literature on the down-regulatory effect of foreign (vs. native) language processing on emotional reactions has long speculated that psychological distance is a key mediating mechanism (e.g., Pavlenko, 2012).

Distancing as an Emotion Regulation Tool

So far, our discussion suggests that distancing serves as a common underlying mechanism that explains how a variety of emotion regulation interventions partly accrue their

benefits. Yet, it is also possible to conceive of distancing as a tool itself—that is, several lines of work have shown that distancing can be directly manipulated. Although early research on distancing focused on a small number of tools to help people shift their perspective, over the past 20 years we have learned that there are many ways of cultivating distance directly. Table 63.1 lists these tools, reviewing how they’re commonly referred to in the literature and operationalized.

For heuristic purposes, we organize our presentation of distancing tools into three categories: linguistic tools, conceptual tools, and behavioral tools (see Kross et al., 2023, for a more detailed exposition of this framework). Linguistic tools rely on capitalizing on existing linguistic structures to induce distance (e.g., foreign language use: Caldwell-Harris, 2015; distanced self-talk: Kross et al., 2014; generic “you”: Orvell et al., 2017; expressive writing: Pennebaker & Chung, 2007), conceptual tools directly manipulate the perspective people adopt when reflecting on emotionally evocative experiences (e.g., temporal distancing: Bruehlman-Senecal & Ayduk, 2015; detached reappraisal: Gross, 1998; visual self-distancing: Kross et al., 2012; mindfulness: Moore et al., 2022; big-picture appraisals: Travers-Hill et al., 2017), and behavioral tools include broader behavioral activities that indirectly cultivate distancing (e.g., “awe” activities: Anderson et al., 2018; rituals: Hobson et al., 2018).

Recognizing that there are multiple ways of inducing distance is important because it is possible that different types of distancing tools function differently for different people in different situations. For example, although some work has shown that adopting the perspective of a third-person visual observer provokes social anxiety (Schultz & Heimberg, 2008), other work has shown that using one’s name and other non-first-person singular pronouns, such as “you” (vs. thinking in the first-person using “I,” “me,” “my”) to work through anxiety prior to giving a public speech, alleviates such feelings (e.g., Kross et al., 2014).

Furthermore, different distancing tools may uniquely impact people’s appraisals. For example, temporal distancing operates by activating *appraisals of impermanence* (i.e., recognizing that the implications of a stressor and one’s emotional reactions to it will lose their significance with the passage of time). Distanced self-talk functions by activating *challenge* (e.g., “I have enough resources to deal with this situation”) versus *threat* (e.g., “The difficulty of the situation exceeds my resources”) appraisals. And awe works by shrinking how central one views the self in the world. These differences highlight the need to carefully study the nuances that characterize the operation of different distancing tools. They also raise questions about whether there are additive or multiplicative effects associated with the use of multiple tools jointly.

Distancing via Others

The tools we list in Table 63.1 have been mostly studied at the intrapersonal level (i.e., people activating each tool on their own to regulate their emotions)—however, as Beck’s (1970) insightful commentary intimates, other people can themselves act as a distancing tool in at least two, often intertwined, ways. First, in situations where we do not access distancing tools on our own, either because we lack the motivation to do so or the know-how, other people can help us activate them by providing reminders or direct instruction (e.g., “Think about how this will feel in 10 years,” “Remember to become a fly-on-the-wall and watch yourself”), much like a therapist or coach does in professional settings.

TABLE 63.1. Distancing Tools: Nomenclature, Operationalization, and Type of Distancing Manipulation

Tools	Operationalization	Manipulation type
Linguistic tools		
Distanced self-talk	Referring to the self with second- or third-person singular pronouns and/or one's name while reflecting on a current stressor	Direct
Generic "you"	Using the word <i>you</i> generically to refer to the self (e.g., "You win some, you lose some") while reflecting on a current stressor	Direct
Foreign language use	Using a foreign language to reason about emotional issues	Indirect
Expressive writing	Writing repeatedly about one's deepest thoughts and feelings surrounding negative experiences	Indirect
Conceptual tools		
Temporal distancing	Taking on the perspective of a far-future (e.g., in 10 years) self while reflecting on a current stressor	Direct
Big-picture appraisals	Applying to a current stressor a series of big-picture appraisal themes (e.g., "This won't feel as bad in the future"; "Good things can even come out of bad events"; "What would you say if this were happening to someone else?")	Direct
Visual self-distancing	Reasoning about an emotional experience while visualizing the self in the experience from a third-person observer perspective	Direct
Detached reappraisal	Reflecting on a negative experience while adopting a neutral, nonemotional, third-party point of view	Direct
Mindfulness	Adopting a nonjudgmental, nonreactive stance to inner experience, observing and describing experiences, and acting with awareness	Direct and indirect
Behavioral tools		
Rituals	Enacting a predetermined order of actions and are often tied to socially and culturally shared meaning systems	Indirect
"Awe" activities	Engaging in activities (e.g., nature walks) that lead participants to perceive vastness to such a dramatic degree (particularly in comparison to the self) that it forces them to alter their default frame of reference	Indirect

Second, because other people often aren't going through the same emotionally trying issues that we are experiencing (and hence are distanced observers by definition), they can do the distancing for us—for example, by nudging us to consider alternative interpretations, or by role playing different perspectives (e.g., Lee et al., 2020).

Moving Forward

Numerous questions surrounding the concept of distancing persist. Here we highlight four future research directions that stand out to us as particularly urgent for moving work in this area forward.

The first direction involves examining how different distancing strategies interact, both in the laboratory and in daily life. The overwhelming majority of work in this area has focused on carefully profiling how the individual distancing tactic operates. Yet, in daily life people often use multiple strategies (e.g., Ford et al., 2019). Thus, understanding whether people benefit additively or multiplicatively from using specific combinations of distancing tools is important. Future research should also examine more broadly how distancing tools interact with other strategies (e.g., attention deployment, situation selection). It is possible that the most beneficial emotion regulation outcomes accrue from utilizing multiple types of tools together.

Another important future research direction is to examine the role of individual differences. Different people might respond differently to the same distancing interventions (e.g., Kross et al., 2017) and the effectiveness of any one distancing tool may be both person and situation specific. For example, under highly stressful situations, the use of distanced self-talk over other distancing tools might be strategically advantageous because the former is less effortful and thus, easier to implement (see Orvell et al., 2019, for a discussion). Similarly, temporal distancing might be useful for facilitating self-reflection when facing stressful situations that are limited in duration, but less effective for chronic stressors. These considerations suggest that adopting a “toolbox approach” to emotion regulation (Fujita et al., 2020) might be instrumental in allowing researchers to ask interesting questions about person \times situation \times strategy “fits” that underlie patterns of adaptive emotion regulation.

Research also needs to examine when distancing is suboptimal. To the extent that distancing is a process, its utility should depend on the circumstances under which it is activated. If, for example, one's goal is to amplify (vs. reduce) positive feelings, adopting a distanced perspective is less functional than an immersed perspective (Gruber et al., 2009). Similarly, if a person's goal is to increase their negative feelings to stoke collective action against discrimination, distancing may not be the emotion regulation strategy of choice (Green et al., 2019). Thus, identifying when distance helps people achieve their goals and when it does not is important.

Finally, more work is needed to examine the real-world implications of distancing for alleviating suffering. The bulk of work on distancing has been performed in the laboratory. Although there are exceptions (e.g., Nook et al., 2022; Orvell et al., 2022), we need to understand how these strategies operate in daily life amid the competing forces that might work to reduce the potential salubrious impact of these tools that has been demonstrated in the laboratory. Understanding what the roadblocks are for translating basic scientific research on distancing into scalable, efficacious interventions is an urgent need if work in this area is to move beyond having a basic science impact.

ACKNOWLEDGMENTS

Ethan Kross and Ozlem Ayduk contributed equally to the preparation of this chapter. A more detailed treatment of the distancing tactics reviewed in this chapter can be found in Kross et al. (2023). We thank Ana Bachrach for her help preparing the manuscript.

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CHAPTER 64

Rumination

EDWARD R. WATKINS

When faced with difficulties, people can adopt many different emotion regulation strategies, including cognitive strategies, such as reappraisal, problem solving, and distraction. A further cognitive strategy commonly observed is rumination, defined as repetitive thinking about the experience of negative emotion and events, and their causes, meanings, and consequences (Nolen-Hoeksema, 1991; Watkins, 2008). Rumination is adopted as an attempt to problem solve and make sense of difficulties and emotions (Lyubomirsky & Nolen-Hoeksema, 1993)—however, compared to other common emotion regulation strategies, such as reappraisal and problem solving, rumination is a maladaptive strategy, with the largest association with psychopathology (Aldao et al., 2010). In this chapter, I review what is known about the consequences of rumination, and why people might ruminate, before considering how rumination is associated with physical health and what treatments effectively reduce rumination.

Rumination and Its Consequences

Rumination is proposed to be a transdiagnostic process that contributes to the onset and maintenance of a wide range of psychological disorders (Ehring & Watkins, 2008). Large-scale longitudinal studies find that rumination contributes to the onset, maintenance, and recurrence of major depressive episodes and depressive symptoms across follow-up periods ranging from 6 weeks to 5 years, anxiety disorders, substance abuse and alcohol abuse, eating disorders, and posttraumatic stress disorder, even after controlling for initial symptoms (see Ehring & Watkins, 2008; Nolen-Hoeksema et al., 2008; Watkins & Roberts, 2020, for reviews). Rumination mediates the association between stressful life events and later anxiety and depression in prospective studies. Experimental studies find that rumination magnifies and prolongs existing negative moods and negative thinking, interferes with effective problem solving, and reduces sensitivity to changing contingencies and context, and, thereby, contributes to the onset, maintenance, and exacerbation of

psychopathology (see Nolen-Hoeksema et al., 2008; Watkins, 2008; Watkins & Roberts, 2020, for reviews; see Lyubomirsky & Nolen-Hoeksema, 1995, for key studies).

Ecological momentary assessment (EMA) studies allow an ecologically valid close-to-real-time study of what triggers rumination and its consequences in the real world. EMA studies find that rumination at one moment predicts negative affect at a subsequent moment, with a recent study that used dynamic structural equation modeling confirming that rumination and negative affect each have reciprocal time-lagged effects on each other (Blanke et al., 2021). Another recent EMA study found that a process-related model (e.g., measures of distress, uncontrollability) was a better fit to the data and better predictor of subsequent symptoms than content measures (e.g., thoughts about feelings, problems; Rosenkranz et al., 2020). Individuals who show a strong bidirectional association between rumination and negative affect are more likely to develop depressive symptoms over 3 months if they experience high levels of negative affect (Stefanovic et al., 2022).

There is also evidence that elevated rumination at the start of treatment predicts poorer outcomes to cognitive-behavioral therapy (CBT), such as increased time to remission, elevated symptoms at posttreatment, and reduced likelihood of achieving remission from depression and anxiety (see Watkins & Roberts, 2020, for review). Limited change in rumination is associated with limited symptomatic improvement.

Why Do People Ruminate?

Given all these negative consequences, why might people use rumination as an emotional regulation strategy? First, there is evidence that individuals engage in rumination as an attempt to gain insight into the meanings of their feelings and problems, understand why difficult events happened to them, and to problem solve (Lyubomirsky & Nolen-Hoeksema, 1993; Watkins & Baracaia, 2001), despite evidence that rumination actually impairs problem solving (Lyubomirsky & Nolen-Hoeksema, 1995). Second, rumination is hypothesized to be an attempt to avoid unwanted states, such as uncertainty and unexpected negative emotion, and unwanted self-perceptions, such as being lazy or arrogant (Watkins & Baracaia, 2001; Watkins & Roberts, 2020).

Some theorists have argued that rumination is adaptive because it brings attention to important unaddressed problems (Andrews & Thomson, 2009), although in clinical populations, most evidence indicates that rumination is not adaptive. A potential resolution of these different perspectives is that rumination is a normal and potentially functional response triggered by difficulties and unresolved goals (see Martin & Tesser, 1996), but whether it is helpful or not depends on how people think during rumination (Watkins, 2008). When ruminative thinking is abstract, verbal, analytical, and decontextualized, and focused on causes, meanings, and implications (e.g., asking “Why?”), characteristic of rumination in depression, it is maladaptive—however, when concrete and focused on direct, specific, and contextualized sensory experience (asking “How did it happen?”; “How I can do something about it?”), rumination is adaptive, aiding recovery from upsetting events and promoting preparation and problem solving. Experimentally inducing concrete processing during rumination relative to inducing abstract processing improved social problem solving, and training in a concrete style reduced subsequent emotional reactivity to analogue loss events relative to training in an abstract style (see Watkins, 2008, for review). Thus, it may be that rumination becomes an ineffective emotion regulation strategy when done poorly (i.e., in an abstract style).

Factor analyses of the most well-established questionnaire measure of depressive rumination—the Response Styles Questionnaire (Treynor et al., 2003)—support this

conceptualization of abstract rumination as maladaptive. These analyses reveal two factors: brooding and reflective pondering (Treynor et al., 2003). Brooding is characterized by passive comparison of one's situation with an unachieved standard and by an abstract thinking style (e.g., when you feel down, sad, or depressed you think "Why do I always react this way?"). Reflective pondering involves more analysis and introspection (e.g., "Write down what you are thinking and analyze it"). Cross-sectional and prospective evidence indicates that brooding is the more pathological subtype. While some have argued that reflective pondering is purposeful and engages problem solving, the evidence for this is mixed, with reflective pondering also sometimes predicting increased symptomatology.

Another explanation for individuals getting stuck in rumination is that it is a mental habit (Watkins & Nolen-Hoeksema, 2014). Rumination is hypothesized to be a learned, automatic, and habitual response style that is copied from parents or a consequence of overcritical parenting (Nolen-Hoeksema, 1991) or that develops over time when goal-driven rumination occurs repeatedly and contingent on the same context (e.g., low mood) so that rumination becomes an automatic response to that context (Watkins & Nolen-Hoeksema, 2014). As such, individuals experiencing repeated and prolonged periods of difficult-to-resolve goals, associated with low mood, such as chronic stress or abuse, are hypothesized to develop rumination as a habit.

Consistent with this habit account, rumination occurs frequently, unintentionally, and repetitively in the same context of low mood (Watkins & Baracaia, 2001) and self-reported habitual characteristics of negative thinking are associated with rumination (Verplanken et al., 2007). EMA studies support this conceptualization, with the extent to which low mood triggered subsequent state rumination moderated by self-reported habitual quality of thinking (Hjartarson et al., 2021) and higher levels of rumination associated with greater inertia in rumination (Blanke et al., 2021). Moreover, rumination is elevated in those who experience early adversity, including maltreatment and childhood sexual and emotional abuse and in those experiencing family histories of mental health difficulties, interpersonal stress, socioeconomic disadvantage, stressful life transitions, bullying or abuse, and acts as a common mediator between these risk factors and later psychopathology (e.g., Paredes & Calvete, 2014; Spasojevic & Alloy, 2001). Critically, habits are not typically reduced by changing the individual's beliefs, attitudes, and intentions or by providing new information because these approaches do not directly address the pattern of accumulated context-response learning, thus accounting for the persistence of rumination. Instead, effective habit change involves removing the cues that trigger the habit (e.g., low mood, behavioral routine) and counterconditioning an alternative incompatible response to those cues.

Rumination involves the intersection of executive control, attention, and working memory. It has been hypothesized that rumination is a consequence of difficulties in disengaging from negative information and updating the content of working memory (Koster et al., 2011). Rumination is correlated with impairments in inhibitory control, working memory updating, suppression-induced forgetting on the think/no-think paradigm, and task switching, with a recent meta-analysis finding that rumination was specifically associated with difficulty in discarding no longer relevant material from working memory (Zetsche et al., 2018). These associations probably reflect bidirectional causal effects because there is experimental evidence that inducing state rumination impairs performance on tasks assessing executive functioning (e.g., random number generation) but also evidence that training individuals to recruit executive control resources when processing negative information using a negative affective priming or negative flanker task reduces rumination, consistent with executive control playing a causal role in rumination (see Watkins & Roberts, 2020, for summary).

Rumination and Health

A growing research area is the relationship between rumination, physiology, and physical health. The perseverative cognition hypothesis (Brosschot et al., 2006) proposed that rumination repeatedly and chronically reactivates cognitive representations of stressful events and thus prolongs the psychological, emotional, and physiological responses produced to stressors beyond the actual occurrence of the initial event, with associated greater risk for poor physical health. Consistent with this, rumination is elevated in individuals with chronic health conditions (e.g., cardiovascular disease, obesity, chronic pain) and implicated in dysregulated physiological function, such as reduced heart rate variability, increased heart rate, increased blood pressure, and greater cortisol reactivity to and delayed recovery after stressors (see Busch et al., 2017; Ottaviani et al., 2016, for meta-analyses). Reduced heart rate variability is a key index of impaired parasympathetic flexibility: the balance between the activation of the sympathetic nervous system responsible for the fight-or-flight stress response and the parasympathetic nervous system responsible for calmer restorative responses, implicated in flexibility of behavior and emotional regulation. It may be that there is a bidirectional relationship between rumination and parasympathetic flexibility: rumination reduces parasympathetic flexibility but psychophysiological interventions that increase parasympathetic flexibility (e.g., transcutaneous vagal nerve stimulation) reduce spontaneous rumination (Burger et al., 2019).

Treating Rumination

Rumination can be treated and modified. A recent meta-analysis of treatments for depression examined found that mindfulness-based CBT and CBT were both effective at reducing rumination, but that rumination-focused CBT was most effective (Spinhoven et al., 2018). Rumination-focused CBT uses core principles of CBT and behavioral activation with systematic adaptations derived from the experimental literature to specifically tackle rumination as a habit and to shift patients from unconstructive abstract processing to constructive concrete processing. In clinical trials, rumination-focused CBT has outperformed antidepressant medication and clinical management in adults with medication-refractory residual depression (Watkins et al., 2011) and group CBT in adult outpatients with depression (Hvenegaard et al., 2020), and prevented the onset of depression in high-ruminating young adults (Topper et al., 2017).

Cognitive bias modification in which systematic practice introduces training contingencies to modify automatic patterns of processing selectivity (e.g., negative interpretations) can modify rumination, consistent with the hypothesis of rumination as a mental habit. For example, repeated practice at resolving ambiguous descriptions of scenarios in a benign manner successfully reduced trait rumination and worry in individuals with depression or anxiety (Hirsch et al., 2018). Building on evidence that thinking style in rumination is important, repeated practice at thinking about emotional events in a concrete and specific way reduced rumination and depression in depressed outpatients relative to usual care and a relaxation control (Watkins et al., 2012).

An area for development is combining self-reported rumination during EMA with sensing data from personal digital devices in daily life to identify patterns that coincide with rumination in real time and then use supervised machine learning to construct digital phenotypes associated with rumination. Potentially relevant phenotypes for rumination include changes in sleep, heart rate variability, social media use, and physical

and social activity. This could enable changes in rumination to be detected passively and enable “just-in-time” digital interventions, in which warning signs for rumination, such as self-reported or passive sensing changes, are automatically detected and used to prompt individuals to use helpful strategies in advance of a full-blown episode of rumination.

Further Operationalizations of Rumination

There is a debate about the relationship between rumination and worry, with worry typically involving repetitive thinking focused on future events whose outcomes are uncertain. Experimental manipulations of worry and rumination have similar effects on cognition, emotion, and problem solving: their measures are highly correlated, and they share a common factor of repetitive negative thought, suggesting that they involve similar or overlapping cognitive mechanisms—however, they also differ in specific thought content, with worry focused on future threat, and rumination focused on past losses (see Watkins & Roberts, 2020).

The dimensions of valence, context, and level of abstraction are important in understanding rumination (Watkins, 2008). A recent study identified five dimensions from participants’ ratings of idiographic examples of rumination: dyscontrol incorporating repetitiveness and difficulty in disengaging and intrusiveness, evaluative and analytical self-focus and focus on problems, focus on memories and social concerns, valence, and uncertainty (Hallion et al., 2022). These findings converge with other sources of evidence regarding the importance of uncontrollability (Rosenkranz et al., 2020), abstract and analytical self-focus (Watkins, 2008), attempts at problem solving (Lyubomirsky & Nolen-Hoeksema, 1993), and recall of personal memories (van Vugt et al., 2018) within rumination. A useful next step is to explore how these dimensions may causally influence the development and consequences of rumination.

As noted earlier, rumination involves repetitive thinking about important unresolved personal concerns (Martin & Tesser, 1996). We would therefore expect rumination to be activated by and to further exacerbate negative responses to contemporary concerns. Indeed, rumination is implicated in the negative effects of various contemporary stressors, such as the negative effects of social media use, cyberbullying (e.g., Feinstein et al., 2014), and eco-anxiety. Understanding how to shift people from unconstructive to constructive rumination to reduce distress and support effective action (e.g., for tackling climate change) may be an important future research direction.

Network analysis and computational models have recently been applied to understanding rumination. Network analyses are used to examine functional relationships between measures and to explore how component processes may relate to one another. A study combining laboratory tasks of cognitive control and self-reported dimensions of rumination after a stressor suggested that self-criticism was central within the network of rumination components and that there may be reciprocal loops between perseverative thinking, poor executive control, and self-criticism (Bernstein et al., 2017). van Vugt et al. (2018) modeled rumination as a mental habit within a model of memory retrieval based on competitive activation within an existing cognitive architecture wherein activation of a memory depends on how often and how recently it has been retrieved and on spreading activation related to the valence of other memories retrieved. By assuming a high proportion of memories having negative valence, the model reasonably matched actual experience sampling data.

Conclusion

In conclusion, rumination is well established as a maladaptive form of emotional regulation, with negative consequences across a range of psychological and physical conditions, albeit one that may be an attempt to gain insight and solve problems, and that can be constructive under the right conditions (Watkins, 2008). Evidence from convergent sources implicate an abstract processing style, self-criticism, development of a mental habit, and difficulties in discarding irrelevant information from working memory as important processes within rumination.

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CHAPTER 65

The Social Sharing of Emotions

BERNARD RIMÉ

After experiencing an emotion, people feel an imperious need to talk about it, and they do so in almost all cases. That emotions systematically elicit a social sharing process was demonstrated for the first time three decades ago (Rimé et al., 1991). People openly communicate about what happened and how they reacted. Emotional episodes are the subject of a social sharing process 80–90% of the time. It occurs most often several times and with different listeners for the same emotional episode (see Rimé, 2009, for review). The more intense the emotion, the higher the propensity to talk about it. Experimental studies confirmed that situations that increase emotional arousal stimulate social transmission (Luminet et al., 2000), regardless of their valence (Berger, 2011). Only situations involving shame or guilt reduce the propensity to talk about it (e.g., Finkenauer & Rimé, 1998).

Why is the social sharing of emotions so widespread? When asked why they shared an emotion, respondents reported four types of motives: intrapersonal (rehearsing/venting), interpersonal (getting empathy/support/comfort), cognitive (receiving clarification/meaning, advice/solutions), and collective (informing/warning; e.g., Duprez et al., 2015). This chapter examines these naïve psychology responses in light of the psychosocial processes evidenced by research.

Intrapersonal Motives: Rehearsing, Venting

The rehearsing motive concerns positive episodes and implies that people enjoy recalling them. The venting motive regards negative emotions and reflects the stereotype of catharsis, according to which emotional expression would reduce the emotion. Does the research confirm these hoped-for effects?

The memory of a positive emotional experience constitutes a capital. Whenever it is reactivated, benefits ensue under the form of a boost of positive affect. Letting others know about the event largely contributes to capitalizing on positive emotional experiences.

It enhances positive affect far beyond the benefits of the positive events themselves (Gable & Reis, 2010). Its regular practice is positively correlated with the sender's subjective well-being, life satisfaction, and self-esteem (Peters et al., 2018).

Contrary to the widespread cathartic vision of emotional expression, simply sharing negative episodes generally results in an increase in negative affect. Thus, compared to participants who chose not to, those who chose to express their reactions to the 9/11 terrorist attacks on that day reported worse emotional and health outcomes over the next 2 years and the longer their initial expressed reaction was, the worse these outcomes were (Seery et al., 2008). Likewise, participants at risk for posttraumatic stress disorder (PTSD) who disclosed to those with similar risk developed greater levels of PTSD (Hoyt et al., 2010). Delivering a victim impact statement in court failed to contribute to the recovery of victims of violent crimes (Lens et al., 2015). After traumatic events, a current practice consisted of encouraging victims to express extensively their emotions in "psychological debriefing" sessions. Meta-analytic studies revealed that such sessions failed to reduce the psychological impact of events and could even yield opposite effects (e.g., van Emmerik et al., 2002).

It is therefore intriguing that despite these findings of no or negative effects, people are as willing to share negative emotions as positive ones. Experimental studies conducted by Zech and Rimé (2005) shed light on this paradox. Participants described a negative emotional episode of their past with an experimenter. They rated the emotional impact of the shared episode before and after their participation. Participants in the control conditions also did so, but had to talk about either another negative emotional episode or a nonemotional episode. In additional control conditions, there was no sharing at all. Consistently across studies, sharing emotional experiences did not mitigate the emotional impact of the shared episode. Nevertheless, compared to controls, participants who had shared negative emotions considered that their participation was ultimately beneficial to them. They reported both interpersonal benefits (e.g., feeling understood and comforted) and cognitive benefits (e.g., better understanding of the shared experience), which fits two motives reported by participants when asked why they shared an emotion. I examine them one after the other.

Interpersonal Motives: Getting Empathy, Support, Comfort

For positive emotions, sharing positively impacts relationships' intimacy, quality, and even longevity (Gable & Reis, 2010). Importantly, the listener's response plays a decisive role in the intra- and interpersonal benefits of sharing. An active and constructive response reinforcing the positive feelings and reflecting the needs of the sender for understanding, validation, and attention prolongs positive emotions (Hovasapian & Levine, 2018). By increasing the sense of acceptance and the relational links, it contributes to the benefits of both actors (Peters et al., 2018).

For negative emotions, the interpersonal effects of their sharing are of the utmost importance. Examination of listeners' responses revealed that a specific interpersonal dynamic develops in social sharing (Christophe & Rimé, 1997). First, when they rated their emotions while listening, listeners manifested a striking salience of the emotion of interest. Second, the higher the emotional intensity of the episode heard, the higher the listeners' emotion. Third, the higher the intensity of the shared episode, the more listeners displayed nonverbal behaviors (e.g., touching, hugging, kissing) in place of verbal manifestations.

The interpersonal dynamic is thus as follows. By arousing interest and emotions in their listeners, narrators bring them to share their emotional state. They thus induce feelings of being on the same wavelength—or in synchrony. Empathic feelings stimulate the listener's willingness to help and support the sharer. As the recipient of attention, interest, empathy, and support, the sharer experiences enhanced liking for the listener. In the course of such an interaction, the participants necessarily become closer to each other (e.g., Min et al., 2018). The developmental background of the human species sustains such a sharing–intimacy model. Infants' emotion regulation originates in the context of attachment (Bowlby, 1969; Reis & Patrick, 1996). In stressful situations, attachment figures provide the child with presence, appeasement, contact, comfort, support, and meaning. When people face distressing experiences later in life, they turn to their loved ones to find such responses. The latter buffer the destabilization of the person—*insecurity, anxiety, and helplessness*—entailed by negative emotional experiences.

In private emotional experiences, sharing originates from a single source and reaches successive sharing agents in an exocentric direction. When an emotional event strikes a community (victory, defeat, catastrophe, etc.), as many sources of sharing exists as there are community members. Everyone reads the news, thinks about the event, talks about it, and hears others talking about it. As sharing reboots emotions, each sharing recharges the need to share in both sources and targets. Collective emotional events thus trigger chain reactions in which the sharing of emotions can reach astronomical values. In line with the interpersonal dynamics just described, this collective social sharing powerfully enhances social belonging and prosocial attitudes. After the March 2004 terrorist attacks in Madrid, respondents from five Spanish regions answered questionnaires assessing their social responses 1, 3, and 8 weeks later (Rimé et al., 2010). Higher levels of social sharing initially predicted higher levels of social integration, perceived posttraumatic growth, and positive affect assessed 3 and 8 weeks later. Similarly, emotional responses manifested in French tweets exchanged after the November 2015 terrorist attacks in Paris predicted a long-term increase in the use of lexical indicators of solidarity (Garcia & Rimé, 2019). Additionally, expressions of social processes, prosocial behavior, and positive affect were higher in the months after the attacks for the individuals who participated to a higher degree in the collective sharing of emotion. Thus, the collective sharing of emotions after a disaster might reveal the social resilience of a community.

Cognitive Motives: Receiving Clarification, Meaning, Advice, Solutions

Negative emotional episodes arise from situations where expectations are not met. They thus raise perplexity and a need for clarification and meaning that people openly express. But at the cognitive level, the most important contribution of the social sharing of emotions is not commonly known. Studies demonstrated that the way one talks about the episode can affect its emotional impact. This is particularly critical with regard to the regulation of negative emotional experiences. I next examine contrasting cases in this regard.

First, how people talk about a distressing experience can in itself sustain its impact. Modally, the social sharing process develops in the immediate aftermath of an emotion and then gradually fades away (Rimé, 2009). Perpetuation denotes nonresolution. In a longitudinal survey of women who reported an episode of distress at the initial assessment, more than half still shared this episode at follow-up 3 months later and 6 months

later (Curci & Rimé, 2012). Two explanations could account for this persisting impact: either how emotions were shared, or features of the episodes. Structural equation modeling tests clearly favored the first explanation. It suggested that the episode remained unresolved due to corumination, a particularly deleterious form of emotion sharing consisting of interactions extensively focusing on problems and negative feelings. It is associated with positive friendship quality (e.g., Rose, 2002) and high reported social support (Ames-Sikora et al., 2017) but also with depressive symptoms (e.g., Bastin et al., 2014).

Second, how people talk about a distressing experience can alleviate its impact. Cognitive theories of emotion firmly established that emotions result not from the eliciting event *per se* but rather from its cognitive appraisal (Frijda, 1986). Therefore, reducing the emotional impact of a past experience requires adopting a modified perspective on this event (Rimé, 2009). For instance, adopting a self-distancing perspective reduced the subjective emotional reactivity to negative memories (e.g., Kross et al., 2012). Compared to those who analyzed their trauma-related feelings from an immersed perspective (first-person), veterans who adopted a distanced (third-person) perspective evidenced a lower physiological reactivity, though there was no effect for self-reported emotional reactivity (Wisco et al., 2015). Simple reexposure to an emotional experience (thinking) produces the worst effects: Narration was more effective at down-regulating negative emotions than thinking but less than distraction (Wainryb et al., 2018). In line with the perspective-change view, narration was most effective when using past tenses and including positive emotions (Pasupathi et al., 2017).

Listeners' attentiveness, agreement, scaffolding, and expertise play a considerable role in influencing storytelling and in affecting speakers' selves (Pasupathi & Billitteri, 2015). Experiments demonstrated that whereas empathic responses from listeners entailed greater proximity to the listener and an impression of feeling better, a reduction of emotional impact occurred exclusively when listeners stimulated participants' cognitive work (reframing; Nils & Rimé, 2012).

Collective Motives: Informing, Warning

After an emotion, people are eager to inform those around of what can happen. But unbeknown to them, their transmission of their experience extends far beyond themselves. If listening to an emotional story evokes emotion in the listener and if the emotion leads to social sharing of emotion, then the listener should share in turn this story with others. Listeners indeed practice such a "secondary" social sharing in about 75% of cases (Christophe & Rimé, 1997; Curci & Bellelli, 2004). Further, targets of secondary sharing incline to "tertiary sharing." That emotional episodes thus propagate very easily across social networks was evidenced in a field observation of 33 college students who visited a hospital morgue in the context of a class (Harber & Cohen, 2005). Their emotional responses to their visit predicted how many people they told, how many people their listeners told, and how many people the targets of these listeners told about this experience. Within a few days, nearly 900 people heard about this event through these cascading levels of social sharing.

Emotional episodes thus spark the diffusion of an individual's experience to the social network. The higher the emotional impact of an event, the broader its diffusion. Through this process, all group members are informed of what happened to one of them and how this individual faced the situation—a consequence that the person who initiated the sharing is completely unaware of. Together, members of the social network reflect

upon the experience and derive lessons from it for future events. Thus, every significant experience of every single individual can enter the pool of shared knowledge, can impact on shared models of the world and on shared beliefs, and thus can engender changes into the systems of representations shared by the social milieu. In this sense, the social sharing of emotion is a tool for cultural transformation (see Rimé, 2020, for review). As emotions occur when events are unexpected or unpredicted, and as emotions require fast and appropriate responding, the spreading just described provides members of a group with a particularly effective prevention tool for future emotion-eliciting situations. The social sharing process thus offers a powerful social instrument at the service of the continual updating of shared knowledge, theories, and representations. Any individual existence is therefore likely to make numerous contributions to the common construction of shared meaning and thus to the process of cultural construction.

Conclusions

It has long been ignored that emotional experiences are systematically brought into the social field. The social sharing of emotions permeates everyone's life. It also fills the professional lives of psychologists. Traditionally, talking about an emotion was conceived as venting or discharge. The studies reviewed here suggest the need to move to an expanded vision of the contribution of the social sharing to emotion regulation. These studies have revealed important features of emotion that stand in stark contrast to common views. First, emotion is not a state that fades away once the emotional circumstances are over. It permeates the subsequent life of those affected and the higher the intensity of the experience, the stronger its hold on later life. Second, emotions are in no way antagonistic to cognition. They signal cognitive discrepancies between expectations and current experience, and they exert a continuous motivational pressure for the reduction of discrepancies. Third, emotion is not just a private or internal process. When they experience emotion, people turn to others. The social responses that follow emotion can be safely added to the prototypical features of emotional responding. Fourth, a process of propagation of shared experiences feeds social knowledge of emotional events and emotional response. Fifth, because emotion sharing elicits similar emotions in targets, sharing strengthens the social bonds between interactants. The social sharing of emotions is thus a particularly powerful tool for improving social integration. The interpersonal and collective implications of these observations await further empirical development. In particular, we need data on the contents exchanged in the context of emotional experiences, on the evolution of these contents during their diffusion, on the impact that these contents and their diffusion have on individuals' knowledge, as well as on social representations and shared knowledge, and, of course, on the cultural contexts in which emotions take place.

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SECTION XIV

EMOTION REGULATION
ACROSS DISCIPLINES

CHAPTER 66

Emotion Regulation in Legal Settings

TERRY A. MARONEY

Law is a human enterprise. It is created and given life by legislators, judges, lawyers, jurors, litigants, witnesses, experts, criminal defendants, victims, and court staff, as well as law enforcement, administrative, and regulatory officials—indeed, the entire polity. A single ruling from the U.S. Supreme Court can spark waves of “elation and shock” (Bosman, 2022, p. A1), followed by decades of ripple effects on individuals, families, and communities, each ripple presenting its own emotional dynamics and coping challenges. Law touches human lives through processes as diverse as a Senate impeachment trial, probating a will, a homicide investigation, placing a neglected child in foster care, an eviction hearing, and siting of a coal-ash disposal site. Humans bring emotions to all legal processes, and those processes spark emotions in them (Bandes et al., 2021).

Legal settings, though, impose distinct feeling rules—what one is supposed to feel—and display rules—what feelings one is permitted to show, regardless of what one feels (Lively, this volume)—meant to serve systemic goals, such as maintaining order and projecting an image of fairness. Emotions and their associated behaviors have varying levels of fit with such goals. Divorcing spouses may despise each other, but a judge or mediator will help them to focus on shared goals—or, at least, to not hurl invective. A court reporter should not laugh when a witness says something ridiculous. Legal settings thus are an important context within which a diverse array of emotions is regulated. That regulation operates under the shadow of a legal culture of dispassion, springing from three bedrock assumptions: reason and emotion are separable, law rightly privileges the former, and legal rules and practices are necessary and sufficient tools with which to moderate or eliminate emotion’s influence at both the system and individual levels (Maroney, 2006).

Legal emotion regulation on the ground is a more complex story. Expressions of sorrow or fear, frowned on in appellate arguments or corporate contract disputes, are typical in a family or criminal court. Naturalization ceremonies buzz with pride. Lawyers may encourage witnesses to express emotions—for example, because the humiliation caused by a strip search can render it unconstitutional (*Safford v. Redding*, 2009). Legislators

are expected to give impassioned arguments. In real life, the emotion regulation needle does not always point in one direction. Rather, the experience and expression of emotion is channeled into ritualized spaces and practices—for example, removing a bereaved family member who weeps loudly during trial, while allowing (even expecting) them to do so when giving a victim impact statement. Within those constraints, professionals and laypersons pursue their goals by engaging regulatory tools within their ken.

The culture of dispassion, however, remains a distorting factor. An official norm of uniform down-regulation can frustrate legal actors' development of adaptive, flexible regulatory skills and encourage rigid, maladaptive patterns (such as suppression and denial) with deleterious impacts on personal well-being and professional performance (Maroney & Gross, 2014). It can erode popular trust in legal institutions by cementing perceptions that they are detached and uncaring (Leben, 2019). An appropriately complex emotion regulation perspective, in contrast, can help law better reflect and shape its reality.

This chapter highlights key insights from the small but growing empirical landscape, focusing on juror decision making, judges' emotional labor, and lawyers' well-being.

Jurors

A “suggestive but modest” literature (Feigenson, 2021, p. 312) examines juror (or, more typically, mock juror) emotions and the efficacy of the mechanisms law deploys to manage them (Bornstein & Weiner, 2010; Bornstein et al., 2008). Despite the fact that fewer than 5% of civil and criminal cases in the United States are tried before juries, they loom large in both popular imagination and research (Maroney, 2023). Jurors are expected to bring emotions to bear and to lack the professionalization that (supposedly) allows legal elites to set them aside (Phelan et al., 2021). Legal doctrines and practices therefore aim to shape what emotions jurors have, when they have them, and how they are experienced or expressed (Gross, 1998).

Juror processing of evocative evidence—typically images of crime scenes, autopsies, injuries, or child pornography—is the most commonly studied such phenomenon (Phelan et al., 2021; Feigenson, 2021). Mock jurors exposed to gruesome evidence report higher levels of anger and disgust, which in turn are associated with a small but significant increase in punitive judgments in both civil and criminal cases (Grady et al., 2018). If certain trial-evoked emotions heighten “impulses to blame and punish” on a legally irrelevant basis, they may indeed be “inconsistent with the goals of the trial” (Phelan et al., 2021, p. 305) and need to be regulated. Legal doctrine therefore typically requires that jurors see or hear such evidence only if its probative value is worth running the risk of “emotional decision-making” (Phelan et al., 2021, p. 288). The decision tends to be binary—either admit or exclude the evidence—though judges sometimes will pursue a middle ground by, say, limiting the number of images or requiring strategic redactions. This doctrine and its implementation thus establish an extrinsic regulation task, in which lawyers and judges shape jurors’ emotional experiences and behaviors by controlling exposure to, or avoidance of, stimuli.

These legal actors, however, often fail to internalize (or even know of) scientific findings that might improve their performance of these regulatory tasks. Studies suggest, for example, that presenting disturbing evidence through still photos rather than videos, or in black-and-white rather than color, may dampen jurors’ emotional experiences and their decisional influence without a meaningful drop in the information communicated;

the same may be true if visual images are described rather than presented (Feigenson, 2021; Phelan et al., 2021). Courts do not routinely consider such modification options. If evocative evidence is admitted, however, courts generally do give jurors some sort of instruction on how to process it. Instructions are a familiar feature of the cognitive appraisal literature (Richards & Gross, 2000). Consistent with that literature, one study suggests that if mock jurors are told the nature of the evidence in advance, and urged to view it “in a calm and dispassionate fashion” that does not “use any emotion,” they are able to process it with fewer experienced emotions and prejudicial decisional effects (Cush & Delahunty, 2006, p. 113). Unfortunately, preexposure instruction is so rare that jury instruction manuals do not contemplate it. Postexposure instruction is the norm, and (not surprisingly) is “notoriously ineffective” (Phelan et al., 2021, p. 296). So too are the so-called antisympathy instructions typically issued at the end of trial, which advise jurors not to be “influenced by bias, sympathy, or prejudice in reaching [their] decision” (Model Jury Instructions Committee of the Colorado Supreme Court, 2021, E:01). Such instructions come buried in a complicated welter of others, for example, about burdens of proof. Comprehension is poor, and decisions are often the same regardless of the instructions’ specific language (Phelan et al., 2021). Nonetheless, courts assume that jurors understand antisympathy instructions, and assume further that so-instructed jurors will sort between case-relevant and -irrelevant emotions and rely only on the former—assumptions an emotion regulation researcher would find astonishing (Maroney, 2023).

Many common legal determinations are, like this evidentiary one, more psychologically complex than law assumes them to be. A regulatory perspective has much to offer in shaping approaches commensurate with that complexity. Such research should include greater attention to individual differences in juror emotional experience and processes (Gunnell & Ceci, 2010; Matsuo & Itoh, 2017); the interpersonal regulatory dynamics of the group deliberations in which real jurors engage (Phelan et al., 2021); and the impact of cases on jurors, who may experience negative psychological impacts as a result of their jury service (Bornstein et al., 2013; Phelan et al., 2021).

Judges

As the above discussion suggests, judges regularly are called on to regulate the emotions of others, such as jurors. Judges also experience a full range of emotions in the course of their work, which they must regulate as well (Maroney, 2011). Empirical study of how judges perform this two-pronged emotional labor has grown over the last decade (Bergman Blix et al., 2019).

Returning to evocative evidence, consider that in deciding whether to admit, exclude, or modify such evidence judges must first examine it. They then use their reactions (e.g., how disgusted they are by a particular image) to help them predict two things: (1) jurors’ reactions to those same stimuli, and (2) how such reactions will affect jurors’ behavior (e.g., whether or not they will remain able to focus on legally relevant factors). Such predictions may be questionable, given that judges (like most humans) have poor insight into emotions’ decisional impacts and likely underappreciate the emotional diversity of dissimilar others. Further, many judges describe their exposures to disturbing evidence as distressing, shocking, and even physically and psychologically traumatic, impacts that may or may not become muted through habituation (Swenson et al., 2020). Moderating jurors’ emotional experiences—an extrinsic regulatory task—thus spurs associated

intrinsic regulatory challenges for the judges carrying out that task. Judges receive little or no training in meeting those challenges, and may see them as simply “something you need to be able to deal with,” including by quickly moving on. As one put it (Bergman Blix & Wettergren, 2018), “as soon as you’re done with the mutilated body, someone’s committed a tax offense and you have to rule on that” (p. 73), describing a “rule and roll” (p. 61) process of ritualized detachment with unclear outcomes.

As the culture of dispassion fuels inattention to judges’ emotional labor—and even encourages counterproductive avoidance strategies—Maroney and Gross (2014) have urged moves to help judges acquire more adaptive regulatory tools and practice their flexible deployment. Greater “emotional granularity”—ability to perceive, make fine distinctions among, and name emotions—would be predicted to enable those regulatory processes and improve judicial decision making (Gendron & Feldman Barrett, 2019). The process model of emotion regulation (Gross, 1998) further predicts that distinct regulatory strategies hold differential promise for helping judges manage their emotions while remaining true to their professional obligations.

The small empirical literature tends to support these predictions. A study of Australian judges found that skilled deployment of diverse regulatory strategies aimed at both their emotions and those of others is central to personal and professional functioning (Roach Anleu & Mack, 2021), findings echoed with Swedish judges (Bergman Blix & Wettergren, 2018). For example, in order to project a culturally acceptable demeanor, judges often use “surface acting,” the sociological equivalent of behavioral suppression, by adopting a “poker-faced appearance” (Roach Anleu & Mack, 2021, p. 101) or otherwise controlling emotional expression in the body. Surface acting is associated with increased cognitive load and stress, suggesting that it should be used only when absolutely necessary (Maroney & Gross, 2014)—however, those judges who enjoy high levels of workplace control and autonomy would be expected to experience less such strain (Roach Anleu & Mack, 2021; Schrever et al., 2021). Judges also report “deep acting” to change emotional experience itself: One describes handling difficult moments in court by thinking about “remaining calm,” focusing on breathing, and mimicking “the Buddha” (Roach Anleu & Mack, 2021, p. 101). Some engage in social sharing with judicial peers (Bergman Blix & Wettergren, 2018). They diffuse edgy moments by taking breaks or using humor, and may allow themselves to cry once they get home (Maroney, in preparation).

Cognitive reappraisal, a particularly promising regulatory tool, infuses this judge’s account of starting her career in a family court:

I had no concept that parents did such atrocious things to their children in this day and age, and I can remember one of the first files I looked at . . . I thought I was going to be sick . . . looking at it in chambers before I went on the bench, my blood pressure, anger, everything was just running rife . . . I had to pull myself back and walk on the bench and think you’re not here to judge this person on your own standards, you’re here to deal with it on the evidence and only the evidence. (Roach Anleu & Mack, 2021, p. 90)

This judge’s self-talk aimed not to extinguish her difficult emotions but rather to reorient her thinking. Similarly, a Swedish judge similarly reported heading off disgust by reminding herself that an accused child rapist was presumed innocent and, regardless, deserved the court’s best efforts (Bergman Blix & Wettergren, 2018). Shifting one’s internal focus away from the emotionally salient aspects of a situation and toward its professionally relevant ones, as these judges described, would be predicted to help a judge

focus on emotionally salient stimuli and tasks, retain relevant information, and engage in logical processing without the cognitive load, ironic rebound, and poor health outcomes that can attend suppression strategies (Maroney & Gross, 2014).

In line with these findings, leading judges and judicial organizations insist that emotional regulation is a core judicial skill on which judges vary widely and are insufficiently trained (Elek et al., 2017).

Many other aspects of judicial emotion regulation are ripe for future research. Maroney (2020) has proposed that deep-seated patterns of emotional experience and regulation are at the core of “judicial temperament,” a notoriously amorphous concept that is a powerful gatekeeper to judicial service. Emerging judicial wellness research, for its part, suggests that high stress, secondary trauma, substance use, depression, and anxiety are regular features of judicial life, though at lower levels than among lawyers (Schrever et al., 2019, 2021; Swenson et al., 2020); judges also face unique concerns for their safety and that of their families, particularly in an era of high political polarization.

Lawyers

The recent focus on judicial wellness follows a more long-standing concern for lawyers. Acculturation to the culture of dispassion begins in law school, and—much as medical training has been associated with increased emotional detachment that threatens doctors’ personal well-being and professional performance (Maroney, 2011)—legal training has been associated with increased psychological distress and decreased subjective well-being (Young, 2018). Once in practice, lawyers report worrisome levels of depression, anxiety, suicidal ideation, and problematic alcohol use; legal culture may both exacerbate these problems and stymie their identification and treatment, with negative implications for lawyers’ health and their efficacy as advocates (National Task Force on Lawyer Well-Being, 2017). Such findings have spurred an uptick in resources and programs focused on productive coping in legal training and practice, particularly through mindfulness strategies (Institute for Well-Being in Law, 2021; Brafford, 2018).

Conclusions

Emotion regulation suffuses law and legal practice far beyond the examples highlighted here. The doctrine of “crimes of passion,” for example, which treats some murders as far less blameworthy than others, relies on lay concepts of what stimuli will cause an otherwise well-regulated person to become violently dysregulated, and how long it should take for their “blood to cool” so the “voice of reason [can] be heard” (*People v. Walker*, 1965). Similar assumptions about how emotionally distressed people act underlie both the law of self-defense and the excited utterance exception to the hearsay rule (Hamilton, 2015). Police officers may focus on a particular suspect believing they are acting “too upset” or “not upset enough” in response to the circumstances, starting a journey into narrow tunnel vision with disastrous results (Maroney, 2023). Noncriminal matters—which make up the majority of legal processes—are particularly in need of scientific attention. One could go on, and all signs indicate that the interdisciplinary dialogue will. While questions of emotion regulation in law are understudied and undervalued, plumbing their depths promises to benefit legal settings, the humans who work in them, and the public they touch.

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CHAPTER 67

Managing Emotions in Education

THE EMOTION REGULATION IN ACHIEVEMENT SITUATIONS MODEL

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REINHARD PEKRUN

How did earning an A in a course make you feel? Did it help keep you invested in studying for that course? Or did you have to remind yourself not to get overconfident? What about earning a C? How did you manage potential anxiety about the uncertainty that single letter created about your ability to meet the academic goals that were important to you—or your parents? We are talking about achievement emotions: emotions that arise in situations related to meeting competence-based standards of quality (Ashkanasy & Humphrey, 2011; Barsade et al., 2003; Pekrun, 2006). Achievement emotions are important because they influence how well we learn, as well as how we approach learning, including whether we adopt effective strategies and invest effort in our learning. Therefore, if and how we regulate our emotions is a key in our academic and future professional success. In this chapter, we summarize the central tenets of a recent model of emotion regulation (ER) in achievement situations (Harley, Pekrun, et al., 2019) that integrated and extended propositions from Gross's (1998, 2015) process model of ER and Pekrun's (2006, 2018, 2021; Pekrun & Perry, 2014) control-value theory of achievement emotions. We also outline implications for practice and future directions for research in this nascent field.

ER in Education: A Model

Our integrated model of ER in achievement situations (ERAS; see Figure 67.1) proposes that achievement emotions are generated through a four-phase process (situation, attention, appraisal, and response; Gross, 2015; black rectangles in Figure 67.1). This process starts with an achievement situation that is attended to and gives rise to appraisals that

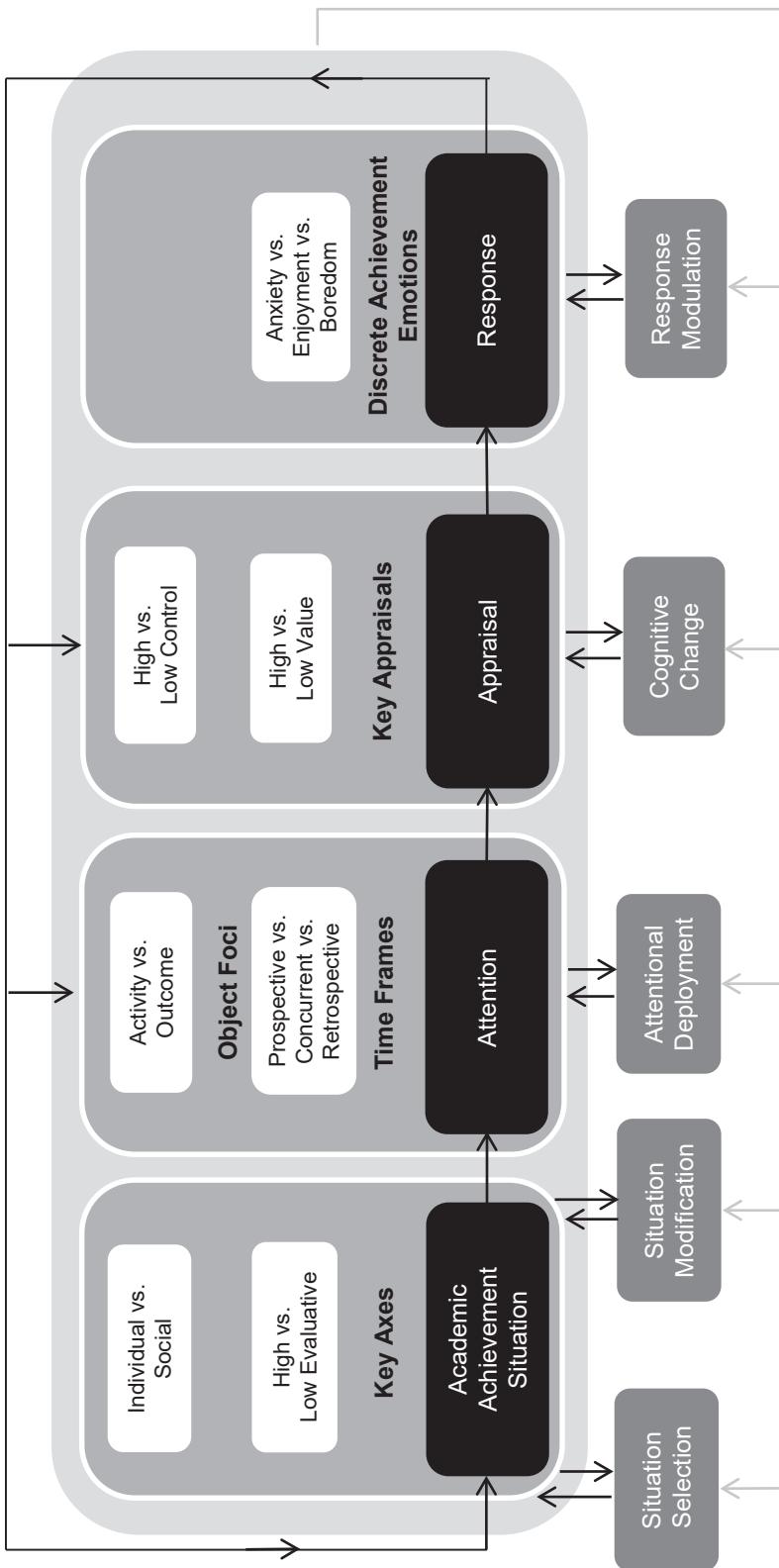


FIGURE 67.1. The integrated model of emotion regulation in achievement situations (ERAS). Adapted from Harley, Pekrun, et al. (2019).

reflect one's assessment of how one believes the situation will impact their goals. As with control-value theory and the process model of ER, our model proposes that emotional responses can, in turn, change the achievement situation, but also one's situation-related appraisals and attention. ER strategies can be organized into five families (situation selection, situation modification, attentional deployment, cognitive change, and response modulation; Gross, 2015; dark gray rectangles in Figure 67.1) that correspond to four discrete points within the emotion-generative process that one can target to regulate their emotions.

Situation selection involves taking action that makes it more likely that one will be in a situation that gives rise to desirable emotions and less likely that one will be in a situation that stands to give rise to undesirable emotions. *Situation modification* refers to taking an action to alter a situation, including adapting a task or learning environment or increasing one's competencies in order to avoid the undesirable emotional impact of a situation. As such, we use the term *situation modification* to broadly denote both changes in the external situation and in one's internal situation, including one's competencies. Competence-oriented regulation entails regulating emotions by developing competencies that make learning successful, thus generating positive and reducing negative emotions (Pekrun, 2018; Pekrun & Stephens, 2009). In educational contexts, this type of regulation is especially important. *Attentional deployment* involves deliberately directing one's focus of attention to influence one's emotional response. *Cognitive change* involves adapting one's appraisals of a situation in order to alter its emotional impact. *Response modulation* involves changing how one is experiencing and/or expressing an undesirable emotion after it has manifested.

ERAS outlines key achievement-related features of each of the four phases of the emotion-generative process (depicted as black-font labels and white rectangles for each phase in Figure 67.1). These features provide affordances and constraints for the implementation and effectiveness of the five ER strategies. The features can influence the use of both corresponding strategies and other strategies. For example, features of an achievement situation limit options to use situation selection and modification, but can also influence cognitive change. The five families of ER strategies, in turn, can be used to influence the corresponding phase of the emotion-generative process (e.g., situation selection influences the situation). In Figure 67.1, two sets of arrows pointing in opposite directions are used to depict the reciprocal relations between features of the emotion-generating process and corresponding ER strategies. Below we discuss the achievement-related features of each of the four emotion-generative processes and their implications for multiple ER strategies.

Achievement Situations: Stakes and Individual versus Social Settings

Achievement situations can be broadly classified along two axes: individual versus social and high evaluative versus low evaluative. We define *individual* situations as those involving a single person. *Social* situations involve multiple people and, at minimum, one-way communication between individuals. Whether an achievement situation is social matters because the emotions of others and social ways to regulate emotions need to be considered in such situations, requiring consideration beyond one's own emotions (Lobczowski, 2020). Regulating negative group emotions might, for example, prevent negative interaction loops (Linnenbrink-Garcia et al., 2011) and low cohesion and performance (De Dreu & Weingart, 2003; Jehn & Mannix, 2001). For collaborative achievement situations, we therefore propose that ER is likely to be most effective when it seeks to regulate both one's own (intrinsic regulation) and group members' (extrinsic regulation) emotions.

Research has illustrated that extrinsic ER can take different forms, including socially shared regulation, where some or all of the group members aim to regulate themselves together in order to reach a shared goal, and co-regulation, where individuals assist one another's regulation (Järvelä et al., 2023; Järvenoja, et al., 2020).

Achievement situations always entail some degree of evaluation but differ in how evaluative they are. *High-evaluative* situations are those that involve a formal achievement-related assessment of the individual or group, such as exams and graded assignments. Informal, implicit assessments of students' performance in class by a teacher, on the other hand, represent *low-evaluative* situations. Stakes are important for two reasons. First, higher stakes typically produce more intense emotions (e.g., anxiety) that tend to be harder to regulate. Second, higher-stakes situations can discourage individuals from adopting strategies that might make them feel good (hedonic ER goals) at the cost of achieving competency-related goals (instrumental ER goals).

These two axes can be used to group educational environments: *individual low-evaluative situations* (e.g., studying), *social low-evaluative situations* (e.g., attending class), *individual high-evaluative situations* (e.g., exams and tests), and *social high-evaluative situations* (e.g., group project presentations). The four types of environments differ in the range of strategies available. Social contexts tend to restrict the availability of intrinsic ER strategies more than individual situations, especially when combined with higher stakes. One cannot, for example, choose to walk out (situation selection) on or tune out (attentional deployment) frustrating members of a group one is completing a project with without risking one's achievement—let alone the ire of the group and further undesirable emotions to manage. On the other hand, social situations offer opportunities to receive help regulating one's emotions, such as from peers. For example, that help can take the form of peers recognizing that a group member is struggling with frustration and engaging in extrinsic ER to support the individual. Alternatively, students can recognize that they themselves are struggling and ask for help from others to improve their competencies (intrinsic ER: situation modification). Situational features of an achievement situation also exert an influence on cognitive change (see below section: Appraisals: Control and Value) and response modulation. For example, the presence of others can make it useful to express one's emotions, but typically constrains the types of expressions that are perceived as socially or professionally acceptable (Burić et al., 2017; Taxer & Gross, 2018).

Attention: Object Focus and Time Frame

Object focus and *time frame* are key features of achievement emotions (Pekrun, 2006, 2021; Pekrun & Perry, 2014) because they influence the attentional lens that determines what aspect(s) of a situation are attended to and are, in turn, appraised. One's focus can be directed toward an achievement activity or an outcome of the activity (object focus). The activity or outcome can be located in the future, in the present, or in the past (time frame). Experiencing anxiety or hopelessness from *anticipating* an activity or outcome leaves the door open to a wide range of ER strategies. One can find a more upbeat studying location (situation selection) or ask a classmate for help (situation modification). On the other hand, if the target of an undesirable emotion is an outcome that has already happened in the *past*, one will have more success focusing on something else: a different focal point and time frame, such as the next assignment (attentional deployment). Changing how one is thinking about a past outcome can also be an effective strategy (cognitive change). Finally, an achievement emotion generated from some *ongoing* activities, such

as class or an exam, provides less freedom if one values their performance. Indeed, even changing the object focus of one's own attention during class (attentional deployment) for an extended period of time can cause one to fail to grasp important concepts and elicit more anxiety down the road.

Appraisals: Control and Value

Appraisals of *control* and *value* are central mechanisms in the generation of different achievement emotions (i.e., emotional response; Pekrun, 2006, 2018, 2021; Pekrun & Perry, 2014; Pekrun et al., 2023). *Perceived control* refers to appraisals of control over actions and outcomes (controllability), whereby such control can be exerted by external factors or oneself (agency). Perceived control also influences the subjective likelihood of acquiring outcomes (see also Marsh et al., 2019). *Perceived value* involves both the perceived degree of importance for oneself (relevance) and perceived direction (negative vs. positive; e.g., goal congruence in terms of events either impeding [negative direction] or supporting [positive direction] goal attainment). With regard to relevance, activities and outcomes can be important in and of themselves (intrinsic value) or because of their instrumental functions for obtaining desired outcomes (extrinsic value). Combinations of high control and positive value generate positive emotions, such as enjoyment of learning when one feels competent to master interesting materials. Combinations of lack of control and negative value generate negative emotions. An example is anxiety triggered by feeling out of control over one's performance on an important exam, which increases the perceived likelihood of failure (negative value).

Control and value are therefore optimal targets for reappraisal (*cognitive change*) in achievement situations. While reappraisal strategies tend to have the most empirical support for improving learning and learning-related processes (Losenno et al., 2020; Strain & D'Mello, 2015) they can be challenged when the stakes are high for two reasons. First, high-stakes assessments, unless one cares little for their competency, are inherently valuable if not very valuable. In other words, there are reasonable limits on how much someone can downplay the importance of something with a critical impact on one's academic achievement. Second, research has shown that higher-intensity emotions, which tend to be aroused in high-stakes situations, can be hard to regulate with cognitive change strategies (Ford & Troy, 2019; Sheppes et al., 2011). Therefore, if the stakes are high and reframing one's control over the situation is not helping to manage an undesirable emotion, enhancing one's competency (modifying the situation) and strategically deploying attention remain good options. Before an exam, one can invest effort in preparing to feel more confident and less anxious about the outcome. During the exam, one might, for example, respond to easier questions first and return to more difficult questions later to reduce trepidation and better manage one's time (situation modification). Similarly, one might ignore how quickly other exam takers are progressing through an exam (attentional deployment).

Emotional Response: Discrete Achievement Emotions

Whether one is anxious or bored can have different implications for achievement outcomes. Additionally, because discrete emotions have different properties, ER strategies cannot be applied uniformly with the same success (Nett et al., 2010; Southward et al., 2019). For example, ER strategies that target boredom should include reappraisals

that enhance the positive value of an academic achievement activity, whereas those that target anxiety should seek to reduce excessive appraisals of lack of control or negative value (cognitive change). Research has shown that response modulation strategies, like suppression, are typically less effective than reappraisal strategies. They may, however, be suitable for down-regulating positive emotions, such as enjoyment or pride, in social situations or to down-regulate exam-related anxiety to improve one's mood (Rottweiler et al., 2018). Indeed, a meta-analysis by Webb and colleagues (2012) found that the to-be-regulated emotion moderated the effectiveness of ER strategies, especially for emotions in different quadrants of the valence × activation space. More recently, Rottweiler and colleagues (2023) found that students' intraindividual ER patterns differed as a function of type of emotion and context experienced.

Implications and Future Directions for Research and Practice

The ERAS model provides guidance on the dimensions of situations and emotions that educational ER research should attend to, and it provides testable hypotheses to guide research. Importantly, ERAS can support generalizability and replicability by encouraging researchers to examine core person-external (e.g., situation classification) and -internal (e.g., appraisal dimensions, object foci, and time frames) features in ER research. For example, one could fail to appreciate the boundaries of generalizing an ER intervention that had been successfully implemented in a low-stakes environment to a high-stakes environment if the stakes are not considered. Similarly, researchers might apply an ER intervention designed to target prospective exam emotions but use this intervention to help students manage concurrent activity emotions about their studying.

To make progress in this field, multifaceted measures of ER in educational settings are needed. An example is the Regulation of Achievement Emotions Questionnaire (R-AEQ), which measures regulatory strategies for three emotions in academic achievement settings: enjoyment, anxiety, and boredom (Loderer & Pekrun, 2019). Experience sampling research that targets momentary use of ER is another promising direction, especially when interindividual and intraindividual strategy use over time is examined (Rottweiler et al., 2023). Beyond self-report, we believe that some of the most compelling and practical future directions for ER involve multimodal and online measurement of emotions—particularly, the use of data streams that can capture the dynamic nature of emotions (D'Mello et al., 2017; Harley et al., 2015; Järvelä et al., 2023; Törmänen et al., 2023). Physiological measures of emotional arousal and automatic or human facial coding are examples of emotion measures that can provide us with insight into important questions, such as: how long is an undesirable emotion (or level of) experienced while learning before ER is attempted? How long does an ER intervention require to take effect during a studying session? How long do ER effects last during an exam? And do the answers to these questions differ based on the learning situation and whether the person implementing the ER intervention is that student versus a classmate, teacher, or artificial intelligence tutor?

In sum, multimodal data channels can provide valuable insight into the ER strategies learners are deploying. We recommend different data channels that ER researchers can use to measure different ER strategies (see Table 67.1).

The ERAS model can help educators, parents, and students broaden their repertoire and increase their use and effectiveness of ER strategies by enriching their understanding of factors that influence emotions, in and outside of classrooms, including those that constrain or facilitate the regulation of these emotions. For example, a teacher might send out an email to students the night before or morning of a test suggesting they try

TABLE 67.1. Measuring Emotion Regulation Strategies Using Multimodal Data Channels

Emotion regulation strategy	Data channel	Example for application
Situation selection and modification	Observational data from video or log files (if computer/app used) of a learning session	Using video to observe students changing ineffective study behavior, such as no longer highlighting every other word and instead making summaries to enhance content mastery and reduce frustration and confusion with material
Attentional deployment	Gaze behavior data to infer attention to an object, derived from eye tracking (granular, low-inference) or head-mounted camera (less granular, higher inference)	Using an eye tracker to observe students keeping their focus on reading a text rather than looking at classmates, thus promoting task-related emotions
Cognitive change	Think-aloud protocols, nonprompted verbal utterances (audio or video recorded), retrospective interviews, self-report ratings and questionnaires	Hearing students remind themselves while working on an assignment they are struggling with that the assignment is not worth much of their final grade, thus changing value appraisals and reducing anxiety
Response modulation	Physiological sensors or automatic facial recognition software to detect emotions	Observing medical residents take a deep breath to steady their climbing heart rate and keep their face neutral after a simulated patient reacts poorly to a medical intervention they administered

re-interpreting bodily feelings of anxiety as beneficial and not a cause for worry (reappraisal; Brady et al., 2018). A parent could also discuss how the brain is changeable and gets stronger through trying new strategies, exerting effort, and facing challenging tasks (reappraisal: augment control; Yeager et al., 2016).

Concluding Comment

Emotions exert a powerful influence on learning, performance, and psychological well-being in educational contexts, as well as a host of downstream effects on educational and occupational career trajectories. It is therefore incumbent for researchers to help equip educators and students with the insight to effectively use ER strategies to help them thrive. While research on ER in education is nascent across K–12 education (Davis, 2016; Yeager et al., 2016), higher education (Ben-Eliyahu & Linnenbrink-Garcia, 2013; Jarrell et al., 2022), and professional education (Harley, Jarrell, et al., 2019; Lundin et al., 2018), the ERAS model provides insight and direction for researchers, students, educators, and parents to help take the reins of these complex psychological processes that can either cause us to crash or help us soar.

ACKNOWLEDGMENTS

This chapter is derived in part from an article published in *Educational Psychologist*, April 29, 2019. Copyright © Division 15: Educational Psychology, a Division of the American Psychological

Association (APA), available online at www.tandfonline.com/doi/abs/10.1080/00461520.2019.1587297. We thank the editors, James Gross and Brett Ford, for their thoughtful feedback on this chapter and Roger Azevedo for his helpful suggestion to create Table 67.1.

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CHAPTER 68

Emotion Regulation in Sport

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Effective emotion regulation is a critical aspect of sport performance. Involvement in sport offers a wide range of contexts where participants experience various intense emotions, such as anxiety from pressure to succeed, shame and guilt following mistakes, anger and frustration from bitter defeats and heartbreakin injuries, and excitement after thrilling victories. Due to the impacts that emotions can have on athletes' skill execution and motor performance (Vine et al., 2016), the ability to regulate emotions effectively has long been a target for scientific research and applied intervention in sport. Within this chapter, we provide an overview of research on emotion regulation in sport, and describe avenues for future research.

Historical Context: Psychological Skills Training and Coping in Sport

Competitive sport is demanding and stressful by nature, and much of the research in sport psychology has focused on understanding how athletes' arousal, stress, and anxiety relate to performance, and subsequently how athletes can effectively manage stressful demands in sport. As an applied discipline, several areas of research developed in parallel within the field of sport psychology, including psychological skills training, coping, and emotion regulation; these areas have a shared focus on understanding how athletes can manage the demands associated with training and competition in sport, and helping athletes perform better in challenging and stressful situations. For example, there is a large body of research in sport psychology that has examined various mental or psychological skills that athletes can use to optimize their sport performance (Vealey, 2007), as well as coping strategies that athletes use to deal with stressors in sport. Researchers and practitioners have spent substantial efforts to study and apply *psychological skills training* (PST), which involves teaching athletes how to use various psychological skills, such as self-talk, imagery, relaxation, goal setting, and attentional control, among others.

Though PST interventions typically aim to enhance performance in general and do not necessarily focus on emotion regulation as their sole target, the links between PST and emotion regulation are apparent. For example, imagery researchers have regarded arousal regulation as one of the key functions of imagery (e.g., *motivational-general-arousal imagery*; Cumming & Ramsey, 2009); breathing and relaxation skills can help athletes regulate anxiety (Pelka et al., 2016); and there is some, albeit mixed, evidence that self-talk can influence athletes' emotions (Fritsch et al., 2022). Accordingly, many PST studies target and assess emotion regulation or emotional experiences as one component of performance improvement interventions.

Emotion Regulation in Sport

Extending beyond the initial research on psychological skills and coping in sport psychology, recently there has been a concerted focus more specifically on emotion regulation. Collectively, research findings indicate that emotion regulation is related to key athletic outcomes, including performance, goal achievement, mental well-being, enjoyment, and social connections (e.g., Bird et al., 2021; Tamminen et al., 2021), and athletes report using a variety of emotion regulation strategies to manage demands in sport contexts. For example, situation selection (e.g., avoiding interactions with a coach or teammate) may be a valuable strategy to avoid the influence of others on athletes' anxiety prior to competition (Wolf et al., 2018). To manage precompetitive anxiety, situation modification may be employed by altering the training environment (Braun & Tamminen, 2019) or by listening to music prior to competition (Stanley et al., 2012). Attentional deployment toward or away from aspects of the environment is also valuable for optimizing performers' emotions (Mesagno et al., 2015)—indeed, the use of imagery is a commonly used strategy that encourages athletes to attend to particular cues in their environment to regulate their emotions and feel prepared for competition (Nordin & Cumming, 2005). Cognitive change (i.e., reappraisal) is one of the most commonly studied emotion regulation strategies (Beatty & Janelle, 2020), and it is often incorporated into athletes' self-talk to enhance self-confidence and reduce anxiety (Hatzigeorgiadis et al., 2009), thereby modulating emotions. Reappraisal is associated with greater excitement and pleasant emotions prior to competition, and individuals who tend to use reappraisal often also tend to believe that pleasant emotions and happiness can facilitate performance (Uphill et al., 2012). Response modulation strategies commonly studied in sport include relaxation and breathing (Martinent et al., 2015), as well as expressive suppression (Kim & Tamminen, 2023). Experimental studies have demonstrated that emotion regulation can enhance performance by reducing the potentially negative impact of emotions on motor responses and cognitive processing (e.g., Balk et al., 2013; Beatty et al., 2014; Wagstaff, 2014).

Performance outcomes and success in training or competition are often key indicators used to assess whether emotion regulation has been effective. Hence, many of the ways that athletes may regulate their emotions might be viewed as being at odds with general recommendations about regulating one's emotions for hedonic purposes (i.e., to feel fewer negative emotions). For example, though emotions such as anxiety or anger may be unpleasant, some athletes may intentionally up-regulate such emotions prior to competing if they view these emotions as useful for performance (Lane et al., 2011). Thus, the demands of competitive sport may entail that athletes up-regulate emotions that feel bad (e.g., anxiety or anger) to serve instrumental purposes. Conversely, athletes

also report that suppressing one's emotional expressions is often necessary for sport performance and team harmony (Tamminen & Crocker, 2013), despite the long-term associations between emotion suppression with negative affect and poor mental health outcomes (Aldao et al., 2010). Furthermore, coaches' beliefs about the function and utility of emotions for sport performance are associated with their attempts to regulate athletes' emotions accordingly (Kim et al., 2021). Hence, studying emotion regulation in sport is unique in terms of assessing what constitutes effective emotion regulation, and general recommendations and principles for adaptive emotion regulation may not be viewed as useful for performance outcomes among athletes, coaches, and sport practitioners.

In sport settings, individuals are often under pressure and required to perform under time-limited, unpredictable, and uncontrollable conditions. Recognizing these complex demands, a recent theoretical development in sport psychology provides researchers with a valuable framework for studying emotion regulation in performance contexts. The temporal influence model of emotion regulation (TIMER; Beatty & Janelle, 2020) proposes that athletes' emotion regulation, motor performance, and performance outcomes depend on competing temporal, perceptual–cognitive, and motor demands of sport tasks. Hence, effective emotion regulation requires different strategies to optimize performance depending on the abundance or constraints of time afforded to the athlete. Time-abundant contexts, such as pre-performance or post-performance periods, afford athletes the time to implement effective emotion regulation strategies that require greater time and cognitive and motor resources. For instance, before or after competition, athletes may be able to engage in situation selection, situation modification, cognitive change, relaxation, and attentional focus toward task-relevant or task-irrelevant cues to modulate their emotions—however, competition is often a time-constrained context where athletes have fewer options for emotion regulation strategies. For example, it would not be possible for athletes to engage in situation selection to avoid competition in order to down-regulate their anxiety.

Athletes' options for emotion regulation also depend on whether they are engaging in self-paced or externally paced tasks, and whether the performance context is high or low in predictability (Beatty & Janelle, 2020). For instance, self-paced tasks that are high in predictability could include a curler throwing a curling stone, or a volleyball player serving the ball, while externally paced tasks that are low in predictability could include soccer goalkeepers making a save or hockey players passing the puck accurately. In time-constrained situations when athletes are engaged in externally paced, low-predictability tasks, the TIMER predicts that effective emotion regulation strategies include those that are the least intrusive and require minimal cognitive, perceptual–cognitive, and motor demands. Athletes in these situations may benefit from using attentional deployment to focus on emotionally neutral, performance-relevant cues (e.g., focusing on the task), rather than attending to performance-irrelevant cues (e.g., distraction, or focusing on secondary cues not immediately relevant for task execution; Beatty & Janelle, 2020).

Social and Interpersonal Influences on Emotion Regulation in Sport

Beyond the task complexity of competitive settings, sport is also a social environment; therefore, the study of emotion regulation in sport has taken an “interpersonal turn” in recent years. Studies examining interpersonal aspects of affective phenomena have considered emotional contagion and the “spread” of emotions in teams (e.g., Totterdell, 2000) and the impacts of coaches' emotion expressions on athletes (van Kleef et al., 2019).

Interpersonal emotion regulation expands the focus of emotion regulation to consider how athletes attempt to regulate their teammates' emotions (e.g., Friesen et al., 2019; Tamminen & Crocker, 2013), as well as the ways that coaches regulate athletes' emotions (Braun & Tamminen, 2019; Kim et al., 2021). Athletes report that their emotions are influenced by their teammates prior to competitions, and they intentionally engage in regulatory behaviors to approach or avoid particular situations in order to maintain optimal emotional states for performance (Wolf et al., 2018). Moreover, teammates (Campo et al., 2017; Tamminen & Crocker, 2013) and coaches (Braun & Tamminen, 2019) regulate athletes' emotions to promote positive team performances and to enhance social relationships between teammates, and these patterns of interpersonal emotion regulation fluctuate in the days leading up to and following competitions (Tamminen et al., 2019).

Social norms in sport also influence the experience, expression, and regulation of emotions. Sport contexts dictate norms for appropriate emotional expressions before, during, and after competition (Gallmeier, 1987), and emotion norms are influenced by leaders, coaches, and sport organizations, as well as by the immediate demands of the situation. For example, masculine, high-performance climates that emphasize toughness and excellence are thought to promote expressions of energy and passion, and the suppression of sadness (Hings et al., 2018). Overall, the nascent research on social norms and emotion regulation suggests that cultural and sport norms influence the extent to which athletes must regulate their emotions within their sport environment.

Future Research Directions

Intervention Research

While there is considerable research on the application of psychological skills, such as imagery, self-talk, and relaxation strategies for improving sport performance, there has been less research that has explicitly focused on interventions that teach athletes about emotion regulation and that change the strategies they use to regulate their emotions in sport. Nonetheless, several programs and interventions delivered in sport settings demonstrate positive impacts of interventions and educational programs for athletes' emotion regulation. For example, a mindfulness–acceptance–commitment intervention was useful in reducing athletes' emotion regulation difficulties, which was associated with improved performance in training (Josefsson et al., 2019). Similarly, a pressure inurement training program implemented in a women's cricket team included educational information about accepting and understanding emotions and showed positive effects on athletes' cognitive reappraisal, although the program did not show any effects for athletes' use of emotional suppression (van Rens et al., 2021). Other applied approaches to improving performance are grounded in the *individualized zones of optimal functioning* framework (Hanin, 2000), which emphasizes athletes' awareness and regulation of emotions and psychobiological states to optimize performance. Continued research is required to identify which strategies are most effective in particular contexts to achieve successful sport performance outcomes, and intervention research is necessary to determine how athletes can best learn and apply these strategies.

Development of Emotion Regulation in Athletes

Given that many athletes begin participating in sport at a young age, and that performance at elite levels of competition often occurs during late adolescence and early

adulthood, another critical area of research is the development of emotion regulation. While there is limited research on the emotion regulation strategies that are used by young athletes, their use of cognitive reappraisal is positively related to adaptive outcomes, such as satisfaction and social connections with teammates, whereas the use of expressive suppression is negatively related to these outcomes (Kim & Tamminen, 2023). Building on this work, it is important to identify how athletes' use of different emotion regulation strategies develops over the course of adolescence, and how athletes may develop more adaptive emotion regulation strategies for performance. Such research also requires a developmental lens, taking into consideration the psychosocial and cognitive development and capacities of youth athletes that constrain or enable the development of effective emotion regulation strategies as they mature. One exciting avenue in the advancement of research on emotion regulation is to explore how activities in sport contexts can provide opportunities for youth athletes to develop emotion regulation skills, by learning and applying strategies in situations that produce a range of positive and negative emotional experiences.

Methodological Challenges and Advances for the Future of Emotion Regulation Research in Sport

A critical issue in studying emotion regulation in sport is that it involves a complex environment that presents several difficulties for researchers: on the one hand, it is logistically challenging to study athletes in competitive situations to understand what strategies athletes actually use in competitions or in training settings. On the other hand, it is difficult to simulate the competitive demands and the intensity of emotions experienced in sport competition within experimental lab-based settings, and moreover, it is challenging to conduct controlled intervention or experimental research in complex competitive environments. As such, researchers studying emotion regulation in naturalistic sport settings have tended to focus on studying the strategies that athletes use to regulate their emotions in the pre-competitive or post-competitive periods using retrospective self-report measures (Beatty & Janelle, 2020). Some experimental studies have used cycling tasks (e.g., Wagstaff, 2014) and golf tasks (e.g., Balk et al., 2013), which have proved useful for studying emotion regulation and performance in lab-based settings. Another novel development pertains to research examining competitive video games as a context for clarifying the mechanisms underlying the links among emotions, approach tendencies, and performance outcomes (Behnke et al., 2022). Video games and esports hold the potential to provide a useful context for understanding how emotions are linked to performance outcomes.

However, controlled experimental settings may not elicit the intensity and range of emotions that athletes experience in "real" competitions when pressure is high, and video game performance does not require the same type or level of physical training and conditioning that is required of athletes—thus, further research is needed to develop and adopt novel methods to study emotions and emotion regulation in naturalistic competitive athletic settings. Recently, researchers have adopted the use of video-based recall methods (e.g., Campo et al., 2017) to assist in gathering information about the emotion regulation strategies that athletes use in competitions. This work has been valuable for analyzing moment-by-moment strategies that athletes use to regulate their emotions and the emotions of their teammates in competition. Hence, advancing research on emotion regulation in sport requires the use of novel methodologies and study designs to get as close as possible to "the real thing" in competition and training.

Concluding Comment

Sport is a complex environment for studying emotion regulation. Competitions are emotionally intense events that pose varying constraints on individuals' capacities to perform, and effective emotion regulation is critical for athletes to successfully modulate their emotions, execute motor skills, and achieve performance outcomes. Sport is also a social context where athletes interact with and are affected by their teammates, coaches, opponents, and spectators, creating further complexity for understanding the processes of emotion regulation and their impact on performance. Key areas for future research include understanding the impact of emotion regulation strategies on performance and well-being before, during, and after competition, and improving athletes' emotion regulation abilities through interventions and education to promote optimal performance and well-being.

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CHAPTER 69

Anthropology and Emotion Regulation

REBECCA SELIGMAN

Psychologists have shown that emotion regulation is intimately connected to both the how and why of emotions: specifically, how and why people's emotional experiences come to be shaped and reshaped, modified and modulated. The majority of research on emotion regulation has taken place in European American contexts. Hence, we still know much less about how emotional processes unfold in diverse social and cultural locations, including how emotion itself is understood differently and how it is tied to different social statuses. In this chapter, I explore what we can learn about people's efforts to modulate and manage emotion using the comparative research and social theory of anthropology. In particular, I show how anthropological interventions draw attention to the culturally specific aspects of emotion regulation, its intersubjective nature, and the links between management of emotion and structures of power.

Emotion Regulation as a Social Process

Anthropologists engaged in the ethnographic study of populations across widely varied cultural and social contexts have provided convincing evidence of the diversity of emotions—including differences in how emotions are expected to feel, who feels them, where they come from, and how and when they should be displayed, to name just a few (Lutz & White, 1986; Rosaldo, 1984; Shweder, 2004). Such research suggests that emotions are at least partially “culturally constructed,” meaning that the experience, expression, and regulation of emotions is tied closely to the emotion-related ideas, expectations, and performances that people learn and internalize via their social worlds (Beatty, 2014; Besnier, 1995; Lutz & White, 1986). Anthropological research has highlighted the fact that European American psychological models of emotions are themselves culturally constructed. These models, which shape both our understanding and experience of emotions, tend to see them as phenomena with an inside-out orientation—originating

within individual bodies and minds and “mov[ing] outward toward others” (Ahmed, 2004, p. 117; Rosaldo, 1984). Dominant understandings of both emotional reactivity and emotion regulation follow this inside-out directionality, focusing on the internal generation of emotional responses, individual awareness and perception of responses, formation of emotion-related goals, and individual-level strategies and practices for control and modulation (Gross, 2014). Anthropological theories of emotions emphasize, by contrast, their outside-in directionality—underscoring the way that both emotional reactivity and regulation are shaped and defined by their social meanings and enactments and calling into question the linearity of the reactivity → regulation dynamic.

Anthropological research on the social dimensions of emotion has highlighted two core, interrelated features significant for understanding emotion regulation.

Emotions Serve Important Social Functions

Emotions *do* things socially (Ahmed, 2004). They are a form of feedback that individuals give and receive about their social interactions, relationships, and status (Stodulka, 2017). As such, emotion regulation is tied closely to efforts at positioning oneself in social space, at enacting identity, and affecting others. For example, in Lutz’s (2011) classic research on emotions in the Ifaluk Islands, she describes the emotion *fago*, a mixture of compassion, love, and sadness. *Fago* is considered a sentiment of maturity; to feel compassion for someone in need defines one’s identity as a full member of society. Those who are themselves immature or needy do not feel *fago* (Lutz, 2011). Thus, the enactment and experience of *fago* does the specific social work of defining and reinforcing the nature of Ifaluk personhood, interpersonal relationships, and social hierarchies.

What work might the expression of anger do between two males in the United States who get out of their cars to fight each other (Gross, 2014)? What work does it do for a boss to be explosive and unpredictable? For a teen to appear sullen and shut herself in her room? Emotion regulation in each case is a way to relate to, connect, withdraw from, or exercise control over people and situations (Kockelman, 2003; Schieidecker, 2019; Stodulka, 2017). The regulation and expression of emotion is a way to affect others and to demonstrate or conceal their effects on oneself. As such, emotions and practices of emotion regulation can be thought of not merely as reactive but potentially “generative, dynamic and productive” social forces (Berg & Ramos-Zayas, 2015, p. 661). Such grounded approaches also underscore the ways in which people’s efforts at emotion regulation incorporate more than just their own cognitive resources but also their use of available social and material resources and learned practices that serve to “sustain, amplify, or dampen” emotions (Colombetti & Krueger, 2015, p. 1160).

Emotions Are Shaped and Constrained by the Social Order

Individuals learn to regulate their emotional responses and expressions according to what is understood to be appropriate and *possible* for a person to feel in their social context (Shweder, 2004; Seligman, 2022). This underscores the complex links between emotional reactivity and emotion regulation, as thresholds for emotional responding are set differently based on social norms, and these normative set points can be thought of as an “outside-in” form of emotion regulation. Enforcement of norms for emotion regulation thus represents a key part of how societies propagate and sustain particular social structures. In order to understand the *why* of emotion regulation—why individuals activate

particular goals to regulate their emotions at particular times and places (Gross, 2014)—anthropological research therefore suggests it is crucial to understand the nuances of social context at both the micro and macro levels.

In her classic ethnography of a group of Inuit in Northern Canada, Jean Briggs (1970) demonstrates, for example, how norms for emotion regulation discourage strong emotions, especially anger, which could disrupt the delicate social fabric in a tiny, intimate group deeply dependent on one another for subsistence and survival. Briggs's ethnography underscores the key links between emotion regulation and what we might think of as the social and political-economic structure of the society. It is important to note, however, that this research took place in a very small, relatively homogeneous setting decades ago. More contemporary research has had to account for the complexity of the relationships among emotion ideologies, social structures, and political economy in large-scale, heterogeneous societies. Newer research also takes into account globalization, which has rendered the notion of discrete cultural systems obsolete (Boellstorff & Lindquist, 2004).

Anthropologists have increasingly highlighted the role of factors, including “the state and other political, religious, and economic institutions in legitimizing, organizing, and promoting” particular ideologies of emotion and the practices of emotion regulation they entail (Good et al., 1988, p. 4). For example, scholars have richly demonstrated the complex politics of grief in Brazilian shantytowns and the politics of shame in the context of Indonesian gender relations (Scheper-Hughes, 1992; Boellstorff & Lindquist, 2004). Similarly, scholars have noted the politics of the emotion regulation construct itself, drawing links between emotion regulation and the political economy of global neoliberal capitalism—the contemporary global capitalist system in which responsibility for well-being, success, and care falls on individuals rather than the state. They argue that explicit concern with emotion regulation via research, pedagogy, and therapeutic intervention has become part of a broader regime of self-monitoring and self-control that supports the neoliberal order (Bialstok & Aaronson, 2016; Rose, 1998; Wilce & Fenigsen, 2016).

Recent work in anthropology has further explored the ways in which emotion norms, including practices of emotion regulation, support structures of power and social hierarchies within and across societies. Such research has demonstrated how race, ethnicity, and gender shape and constrain which emotions are recognized in which people as legitimate and expressible. Women in European American society, for example, continue to be viewed as overly emotional, and their expressions of emotion treated as exaggerated, dramatic, and inappropriate (Boellstorff & Lindquist, 2006; Canna & Seligman, 2020; Rebhun, 1994). This gendered emotion script has important implications for women's emotion regulation through the social feedback they receive in response to their emotions—particularly, sadness and anger.

Similarly, social theorists have demonstrated that emotions are highly racialized in the United States, in two important senses. First, in the sense that notions of particular kinds of emotionality have helped to construct racial “others”—for example, the angry Black woman, the passive Mexican migrant, and so on. Thus, emotion becomes part of the construction of particular racial stereotypes while also constraining the possibilities for emotional expression among members of racialized groups. Second, critical analyses suggest that because the emotional lives of ethnically and racially diverse groups of Americans are measured against the dominant (White middle-class) norms in the United States, their emotion regulation practices are more likely to be pathologized (Seligman, 2022; Ramos-Zayas, 2011; Berg & Ramos-Zayas, 2015). Pathologization of particular

kinds of emotional states among racialized groups (i.e., anger among Black Americans) serves, in turn, to sustain power inequalities and structural hierarchies (Palmer, 2017; McElhinny, 2010).

In summary, anthropological research and contemporary theory emphasize the importance of understanding emotion regulation as grounded in the social norms, expectations, and structures specific to people's lived contexts. Classic anthropology of emotion has focused especially on the cultural variability of the social rules of emotion and the social functions that different forms of emotional expression and emotion regulation serve. Contemporary theory draws our attention to the connections among social identities, power dynamics, and political-economic structures in shaping and constraining emotions and their regulation.

Emotion Regulation as an Embodied Process

As the preceding discussion illustrates, emotion and emotion regulation link social and political processes with individual experience. A key element of emotion as it unfolds at the individual level is its bodily dimensions: the carnal response or surge of feeling that we associate with being affected by something. While the body was notably absent from much of the classic anthropology of emotion (Lyon, 1995), recent work emphasizes the importance of raw, bodily responses to experience, which social theorists refer to as "affect"¹ (Stodulka, 2017; Ahmed, 2004). While some theorists have treated affect as separate and prior to the sociocultural process of recognizing, labeling, and managing emotions (Leys, 2011), a strong body of research is now emerging that integrates the embodied and social aspects of emotion.

The relationship between socially learned ideas, expectations, and performances and embodied, physiological responses can be thought of as a continuous feedback, or looping process, in which the learned and the felt constitute each other (Hacking, 1995; Seligman, 2014; Colombetti, 2017; Barrett et al., 2007). Ideas and expectations about emotion shape how our bodies respond, and our perception of bodily responses is shaped by ideas about what emotions are, how they feel, and what one could or should feel in a given circumstance (Seligman, 2022). These reinforcing loops are how culturally specific ideologies about emotions become embodied—how they come to feel real and true and "natural," as opposed to "merely" cultural. As such, the social organization of emotions, including the language we use to express and communicate about them, is a fundamental part of their phenomenology, rather than something layered on top of a universal physiology (Pritzker et al., 2019; Wilce, 2014; Reddy, 2001).

Metaphors, which are central to the linguistic communication of emotion, are a key example of how the social and the bodily come together in the context of emotion. Metaphors are grounded in bodily experience yet influenced heavily by social and cultural conventions (Lakoff & Johnson, 2008). In European American contexts, for example, the conventional metaphor of the body as a container and emotions as a content not only reflects the embodied experience of interiority that many people associate with their

¹Terminology across disciplines is, unfortunately, often inconsistent. Affect has historically been used differently in psychology and other disciplines (Stodulka, 2017).

emotions (Kovecses, 2000), it helps to generate that experience by influencing people's perceptions of their feelings. The notion of interiority draws attention toward internal physiological cues, which in turn reinforce the experience of emotions as stemming from inside the individual (Seligman, 2022).

Similarly, the metaphor of emotion "regulation" draws on dominant cultural meanings related to neoliberal capitalism and the demand within that sociopolitical order to exercise self-control. The management of emotions is inevitably influenced by this metaphor, evoking top-down processes of control and systems of hierarchical authority within governments and workplaces (Illouz, 2008). Alternative metaphors across different social contexts might include notions of emotion "modulation" and "tuning," which in turn reflect and promote different kinds of relationships among self, emotion, and lived experience (Stodulka, 2017).

Communication itself often serves to modulate emotions. For example, anthropologists have demonstrated how "emotives"—emotion statements intended to arouse feelings—are themselves instruments of emotion regulation. Emotives are declarations of feeling that function to alter or direct one's own emotion and that of others in particular ways, "changing, building, hiding and intensifying" them (Reddy, 1997, p. 331; Pritzker, 2020; Wilce, 2014). For example, to declare "I am furious about X" is not only to represent one's existing feeling but to move oneself in the direction of fury and attempt to take others along.

Thus, spoken language, as well as other bodily forms of communication, like gesture, facial expression, and tone, go well beyond their expressive function to "cue affiliative responses, direct attention, and invite reconsidered appraisals" (Pritzker, 2020, p. 244). Ethnographic research has also demonstrated how such embodied forms of communication may be accompanied by synchrony or asynchrony of physiological arousal across bodies (Pritzker, 2020). Thus, the dynamic looping of social and bodily processes often has an intercorporeal dimension whereby emotion is co-constructed or contested among individuals. These dynamics have been particularly well studied within intimate partner relationships and families, but also extend to larger social groups and affiliations (Pritzker, 2020; Goodwin & Cekaite, 2018).

Finally, it is important to note that individual emotions may, at times, be "out of tune" with their social environments—in terms of either dominant norms or the emotional ethos of the immediate social environment (Stodulka, 2017). In such cases, both the threshold for emotional reactivity and the emotion regulation capacity of an individual may misalign with the context. Emotions out of tune are a source of distress when individuals struggle to regulate their emotions or receive negative social feedback. For example, social feedback minimizing or criticizing women's emotional responses may lead to chronically muted emotions, anhedonia, and even dissociation. Some evidence suggests that such emotional patterns may also coincide with a disconnect in mind–body feedbacks and the experience of somatic suffering (Canna & Seligman, 2020).

Future Directions

There are many important directions for the anthropological study of emotion regulation moving forward—I name just two here. First, more research specifically examining the embodied social and political dynamics of emotion regulation in relation to power and hierarchy is sorely needed. In particular, we need research that examines how looping processes that link social and bodily aspects of emotion interact with the embodiment of

racialized identities. Existing work suggests that embodiment of marginalized identities unfolds very differently from that of dominant identities, including the foregrounding and hypercognition of bodies and bodily processes that are often claimed to operate in the background for dominant groups (Ramos-Zayas, 2011; Palmer, 2017). How do the emergent dynamics of emotion, perception, and practices of emotion regulation look among nondominant groups, including ethnic and racial minorities, women, and gender nonconforming people?

Second, it turns out that there is actually very little anthropological research that uses the term *emotion regulation*. Yet there is abundant research on processes relevant to the shaping and reshaping, modulating, and retraining of emotions that does not acknowledge its own relevance to the emotion regulation literature. Such acknowledgment, even if anthropologists are critical of, or choose not to adopt, the language of emotion regulation themselves, would help researchers from other fields to identify and connect to anthropological findings that might complicate and complement their own work. This chapter has been an attempt to do some of that work, but more such engagement would benefit anthropologists and other emotion researchers alike.

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CHAPTER 70

Sociological Approaches to Emotion Regulation

KATHRYN J. LIVELY

Sociologists first turned their attention to what psychologists call emotion regulation (Gross, 1998) in the late 1970s when Arlie Russell Hochschild championed the importance of considering emotion to fully understand both the human condition and social life. She coined the term *emotion management* to describe the sociological equivalent of intrinsic emotion regulation (Hochschild, 1979). Hochschild's early analysis, based on college student writing samples, revealed that individuals managed their own emotions according to the cultural norms that govern emotional feelings ("feeling rules") and expressions ("display rules").

In sketching out a sociological vision for the study of emotion management, Hochschild (1979) posited that women experienced greater demands to manage their emotions and their emotional expressions, compared to men, due to their lower social standing and economic status within society, and prevailing cultural understandings about the nature of femininity. She argued that women are socialized to be more attentive to their own and others' feelings as a matter of economic survival, as well as marital happiness. At the time of writing, Hochschild theorized that this pattern of inequality was more likely to apply to White middle-class women who were at the time—and remain—associated with the cultural ideals of femininity.

Given sociology's greater focus on the interrelationship between individuals and the societies (of every scale) in which they are embedded, sociologists tend to rely on less elaborate understandings of emotion, compared to psychologists who study emotion regulation (Gross, 1998). At minimum, sociologists agree that emotion provides an important signal function, which helps individuals understand how they are faring in given situations. Those studying emotion management, however, have also adopted a four-factor model that assumes physiological response and cognition, but layers in language and expression, both of which are culturally specific and, thus, inherently social (Thoits, 1989).

Because sociologists view the four emotional components (i.e., physiology, cognition, expression, and emotional labels) as interdependent—and associations therein strengthen over time—successful emotion management is viewed as a change to any one of the four components, which will influence the other three. For instance, changing the meaning of a situation typically results in changes to physiology, expressions, and the emotional labels individuals use to describe their experience (Thoits, 1996). When emotion management fails, individuals may judge their emotional experience as deviant (Thoits, 1985), which can create additional emotional burdens (e.g., shame or distress). Individuals who are routinely unable to bring their own feelings back in line with existing norms may eventually come to take on the identity of someone who is an emotional deviant, which may prompt him or her to seek additional help from others—typically “similar others” or mental health providers.

Emotional Labor

When emotion management occurs in one’s private life, it is “emotion work,” and has a “use value” (Hochschild, 1983)—that is, individuals choose to manage their emotions to smooth relationships, affirm relative status, or directly benefit themselves. For instance, the adult granddaughter chooses to hide her disappointment with the ugly sweater that she received during the holidays, not because she must, but because she loves her grandmother and wants to spare her feelings. Granted, she may also want to avoid the judgmental stare from her mother.

When emotion management that occurs in one’s private life is sold for a wage, it is transmuted into emotional labor (Hochschild, 1983). In a labor context, workers are required to mold their expressions to corporately mandated expression rules, though many service occupations may attempt to exert control over their workers’ actual feelings through training and other forms of emotional resocialization to provide a more authentic emotional experience (e.g., Leidner, 1993). Given the importance of emotion as a signal function, Hochschild (1983) warned that service workers, who at the time of writing were disproportionately middle-class White and female, would be at risk for experiencing inauthenticity, alienation, and burnout, and—potentially—damaging their ability to know their own feelings.

Based on Hochschild’s (1983) initial observations, sociological attention to *emotion management*—the umbrella term that included both work and labor—flourished. Those who chose to answer the call to develop a fully formed sociological understanding of emotion management did so, primarily, by turning their attention to the interplay between individuals’ attempts at emotion management and the emotional cultures and status structures in which they were embedded, and the consequences thereof. They also expanded their focus to include men, people of color, professionals, and other types of organizations. Although Hochschild’s initial volley clearly distinguished between emotion work that happened in one’s private life and emotional labor that happens at work, subsequent scholarship has revealed that emotion work also happens voluntarily in backstage areas of workplaces (Lively, 2000), and that women engage in behaviors more akin to emotional labor in the home (Lois, 2013). While many scholars have adopted the umbrella term *emotion management* to cover both, maintaining the original distinction captures the importance of one’s autonomy in determining whether to engage in emotion management, either for their own benefit or at the direction of others for theirs. It also helps to explain why some individuals experience the deleterious effects first identified by

Hochschild and others do not (Leidner, 1993; Wharton, 2009). Another early and lasting distinction that sociologists made in their initial investigations of emotion management was between the attempts that individuals engaged in on their own (intrapersonal) versus that which they engaged in with other people (interpersonal). Studies referring to this latter category did so by highlighting different aspects of the process itself: collaborative (Staske, 1996), interpersonal (Francis 1997; Thoits, 1996), and reciprocal (Lively, 2000).

Emotion Culture

One of sociologists' major contributions to the study of emotion management is their detailed documentation of the emotional cultures to which individuals are accountable. Candace Clark's (1997) watershed study of sympathy in everyday life, for example, is one of the most intricate analyses of emotion norms to date. Adopting a banking metaphor, Clark identifies four emotion rules that individuals need to follow to make sure their "accounts" don't get overdrawn. These rules include not making any undue claims, not asking for too much, accepting some sympathy, and reciprocation. Individuals who fail to abide by these "rules" risk being locked out of the sympathy economy and, thus, being left high and dry when facing something that might require a sympathetic response. She also identifies which type of events are culturally seen as deserving more sympathy (e.g., losing one's home to a freak lightning strike) and those that don't (e.g., losing one's rebuilt home—a second time—to flooding in a known flood zone).

What makes Clark's (1997) analysis so powerful is her unflinching assessment of how social structure and culture work together, putting some individuals in a better position to access sympathy than others. While all members of a society are granted some level of sympathy just by virtue of being alive, their allotments are not uniform. Children are typically granted more sympathy than adults, for example. Women are typically granted more sympathy than men, yet they are also expected to be more sympathetic. And higher-status individuals (e.g., celebrities, athletes) tend to receive more sympathy than lower-status individuals (e.g., teachers, trash collectors). Individuals tend to be—and are expected to be—more sympathetic to "similar others" (e.g., race, sex, sexuality, and legal status), as well as those who are physically closer, which may partially explain persistent racism and other forms of social divisiveness (e.g., urban vs. rural, red states vs. blue states).

While several sociologists focused their attention on particular emotions within specific cultures (e.g., anger, self-pity, love), others have attempted to document rules that govern particular groups—including families (e.g., Cancian & Gordon, 1988), friendship groups (e.g., Simon et al., 1992), specialized settings (e.g., Vaccaro et al., 2011), volunteer organizations (e.g., Lois, 2003), occupations (e.g., Pierce, 1995), and so on. An important aspect of this approach is understanding the processes of emotional socialization, which occurs at various stages of the life course and with various degrees of specificity. While some forms of emotional socialization are quite explicit, as is the case when teaching preschoolers with socioemotional challenges (Pollack & Thoits, 1989) or newly hired service workers (Hochschild, 1983) to manage their feelings and expressions, others are more informal (Simon et al., 1992) and, in some cases, even hidden (Smith & Kleinman, 1989). Cahill's (1998) discussion of mortuary science students suggests that individuals may need a certain "emotional capital" for significant emotional resocialization—in this case, learning to maintain emotional neutrality when handling dead bodies—to succeed.

Consequences of Emotional Labor

Despite Hochschild's (1983) dire predictions about engaging in emotion management in exchange for a wage or other forms of economic security, empirical tests of this assumption were mixed (e.g., Leidner, 1993). Spearheaded in large part by the work of Amy Wharton (2009) and colleagues, sociologists employed community-based studies of "frontline service workers" to scrutinize the effects of emotional labor. These analyses revealed that the negative effects Hochschild predicted were more likely a function of the conditions under which the emotion management was performed than the emotional labor itself. Frontline service workers reported higher levels of stress, inauthenticity, alienation, and burnout—especially when working in conditions where they also lacked autonomy and self-direction (Wharton, 2009).

Similarly, Erickson and Ritter (2001) disaggregated emotional labor into three types: expressing positive feelings, transforming negative emotions, and masking irritation and anger. They found negative effects were significantly higher for those who were required to mask negative feelings. Whereas results were consistent for both sexes, women were more likely to report engaging in this form of emotion management. These findings suggest that Hochschild's (1983) concern that "deep acting" (e.g., *changing* one's feelings through the use of deep memory) was more deleterious than "surface acting" (e.g., *feigning* socially mandated feelings) may have been misplaced and sparked new interest in the benefits and consequences of surface acting (e.g., Diefendorff et al., 2011; see also Grandey, Frone, et al., 2019).

Social Distribution of Emotion Management

Although initial investigations of emotion management focused disproportionately on predominantly female-dominated service occupations, it is now accepted that emotion norms and emotion management are ubiquitous. That said, expectations regarding emotion management differ by the setting in which they occur and the status of those involved.

Whereas emotional cultures within families tend to differ according to family type (e.g., ideologically: Cancian, 1990; or sexuality: Umberson et al., 2015), families tend to require greater emotional engagement and better tolerate negative emotional outbursts than work settings (Lively & Powell, 2006). Notably, within families, all female roles (e.g., mother, sister) are expected to be more pleasant and engaged than their male counterparts (e.g., father, brother; Lively & Heise, 2014).

Conversely, all workplaces tend to expect a greater degree of decorum, though emotional cultures vary depending on the gender ratio of its workforce (Hochschild, 1983). Moreover, women working in male-dominated fields (e.g., policing) are generally assigned the more laborious caring work, whereas men working in female-dominated jobs (e.g., nursing) tend to focus more on the physically laborious or technical elements of the job and bypass the emotionally tasking care work. While most studies on gender in the workplace focus on the higher emotional demands placed on women and other low-status groups, Lois's (2003) study of volunteer rescue workers found that high-status men in traditionally masculine roles are not exempt from the demands of emotional labor. While they may be exempt from care work, they are nonetheless required to manage their own fear, anxiety, and disgust—often to their own and others' detriment.

Studies on the experiences of racial and ethnic minorities reveal much the same. Compared to White counterparts, Black workers across all occupations tend to be

disproportionately policed for anger and aggression because of preexisting cultural stereotypes and White racial fear (Wingfield, 2010; see also Grandey, Houston, et al., 2019). They are also more likely to have to mask their own negative feelings that arise from racially charged microaggressions at work, including those indulged in at diversity, equity, and inclusion trainings when White colleagues lash out for being asked to change their behaviors or acknowledge the validity of others' experiences (Durr & Wingfield, 2011).

Regardless of context, or inequality considered, individuals who carry a “marked” status, which places them outside of the norm, their degree of perceived potency (i.e., power) and evaluation (i.e., likability) are affected (Lively & Heise, 2014). These changes, in turn, alter their own and others’ expectations for behavior, emotions, emotional expressions, and so on. Relating this principle to occupational status *and* gender, untenured and female professors are typically expected—that is, required—to do more emotional labor than professors who are unmarked (e.g., male professors with tenure; Bellas, 1999).

Future Directions

The sociological approach to emotion regulation has highlighted the effects of social structure and culture on a fundamental human process. It has also assessed the inherently social aspects and processes of emotion regulation (e.g., culturally appropriate labels, socialization) and the social and emotional consequences thereof. Much of the effort was dedicated to deeply understanding specific emotional cultures that are inextricably tied to large-scale inequality.

While the last 40 years have provided great sociological insight on emotion management, sociologists who study emotion, writ large, are at an inflection point. The United States, among other countries, has experienced increasingly polarized politics and culture wars that have stretched many institutions and norms around emotion and civility to the breaking point. Moreover, many of the structures that made up the bedrock of sociological research on emotion management are changing. Gender is no longer recognized as binary. Race is no longer recognized as discrete. And there is an increasing appreciation of the need to fully consider the long-overlooked effects of intersectionality—that is, the multiplicative effect of having multiple marginalized identities (King, 1988; Crenshaw, 1989).

Following the first documented cases of COVID-19 in 2019 (Huan et al., 2020), work and family has been upended, and the dividing line between the two is increasingly blurred. Although many workplaces remain hierarchical, they are increasingly decentralized, if not entirely remote, freeing employees from the unrelenting gaze of managers and clients. Workers who were at the bottom of the status hierarchy are increasingly recognized as essential. Additionally, people are changing jobs in record numbers, no longer willing to tolerate the physical and emotional demands that were amplified by the pandemic (U.S. Bureau of Labor Statistics, 2022).

Moreover, after years of rolling lockdowns and contested mask mandates, people worldwide report being exhausted, isolated, fearful, and depressed, as never before. Mental health—and its accompanying emotional deviance—are at an all-time high (Reinert et al., 2021). Taken together, these rapid changes call for sociologists and others who study the more social aspects of emotion to radically reconsider not only their understanding of emotion and emotion regulation but also their understanding of the cultures and the structures within which those experiences occur.

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CHAPTER 71

Emotion Regulation and Art

KATERI MCRAE
THALIA R. GOLDSTEIN

Art is intimately tied to emotional processes. The very idea of an “aesthetic experience” is an emotional experience (e.g., Clay, 1908). Philosophers, artists, and audiences have long noted connections, across cultures and between art and emotion (e.g., Matravers, 2001). Artistic works are often described in terms of their emotional impacts: “tearjerker,” “emotionally evocative,” “calming”—however, these assumptions belie the ways the arts and emotion have been treated by the sciences and empirical research (Goldstein et al., 2017)—art is typically left out of mainstream emotion and affective neuroscience. Instead, there is extensive literature on aesthetic emotions (e.g., joy, awe, terror, fascination) from philosophical, practical, and humanistic traditions. Empirical and experimental studies are often focused on questions of whether aesthetic emotions are responses to style, execution, content, organization, and whether aesthetic emotions are the “same” as real-world emotions (Hosoya et al., 2017).

Yet, art and the science of emotion regulation pair quite well. In this chapter, we use the process model of emotion regulation to explore the theoretical and empirical ways that experiencing and producing art can serve as emotion regulation. The alignment of emotion regulation families with artistic processes can improve mechanistic specificity by articulating how art and emotion regulation are connected, and how the arts can affect multiple facets of emotions. In Table 71.1, we summarize and outline the proposed processes through which emotion regulation connects to artistic processes, across arts domains, for both spectators (audience members) and practitioners (creators). As a note, we use the words *art* and *arts* interchangeably to mean visual art, theatre, film, music, creative writing, and dance. When referring specifically to one particular art domain (e.g., acting), we refer to it specifically. While we cannot avoid it here, when “the arts” are treated like a monolith, it is to the detriment of each art form and the creation of specific knowledge about the unique effects of visual art, theatre, film, music, creative writing, and dance.

TABLE 71.1. Alignment of Emotion Regulation and Artistic Processes

	Audience experience	Artist experience
Situation selection/ modification	All art forms: <ul style="list-style-type: none"> • Preparation/previous experience/expertise • Expectation/anticipation of emotion • Ritual of entry into artistic spaces 	
Attentional deployment	<ul style="list-style-type: none"> • Distraction from extant circumstances • Absorption/transportation 	<ul style="list-style-type: none"> • Distraction from extant circumstances • Pleasant distraction of doing preferred activity • Flow
Cognitive change	<ul style="list-style-type: none"> • Increased perceived control • Psychological distance: <ul style="list-style-type: none"> ◦ Spatial (visual perspective) ◦ Social (perspective taking/ personal empathy) ◦ Temporal (nonlinear storytelling) ◦ Hypothetical (suspension of disbelief) 	<ul style="list-style-type: none"> • Even greater increased perceived control • Perspective taking/personal empathy • Narrative rescripting
Response modulation	<ul style="list-style-type: none"> • Expression display norms • Emotion contagion • Audience effects/synchrony • Direct effects on physiology 	<ul style="list-style-type: none"> • Expression display norms (performing arts) • Up-regulation of expression (performing arts)

Because art is intertwined with emotion in its creation and perception, it has great potential to induce and change emotion—however, people do not always approach artistic experiences with conscious emotion regulation goals, even if emotion change is a result. Certainly, when choosing to watch an uplifting movie, individuals expect and have goals for regulation. Yet people may also be taken to an opera by a friend, with few expectations, and once in the artistic experience, experience emotional change.

Situation Selection and Modification

Why do audiences flock to theaters, museums, and concert halls? Why do artists make art? While there has not been a systematic, large-scale, empirical study on these questions, there is a long-standing theory: because art evokes emotion (Menninghaus et al., 2017; Silvia, 2005). Jarosy and Fieldler, writing in 1936, note: “Nearly all extant descriptions of the great violinists of the past deal exclusively with the emotion of their art and relate how they stirred and touched their heart could carry them away by the force of their emotion. This was the standard by which their playing was judged” (p. 54).

For audience members, we propose that choosing to experience art has the known consequence of evoking emotions and emotion understanding. In fact, critics have proposed that overanalysis of art undercuts its emotional impact, making it less compelling (Shusterman, 1997). Furthermore, the choice to engage with art, knowing its consequences for emotion, is often conscious, making art engagement a form of emotion regulation. Few people stumble into artistic spaces accidentally. While some art forms,

such as music, occur incidentally in public, most artistic spaces have defined entry points (e.g., separation of lobby from theater or gallery) and common rituals to signal the onset of the artistic experience (e.g., ringing a bell or flicking of lights).

For art makers, choreographing a dance or learning to play a symphony takes longer than watching a performance; to engage in art making is therefore a choice to engage in an emotion at a higher intensity and for a longer duration. Furthermore, although an artist may begin by choosing to engage in their art form one session or painting at a time, at some point a conscious choice is made for more consistent engagement via artistic vocations or avocations. It is critical to note that there is basically no systematic research directly asking why artists engage in making art as a consistent practice. One study of master of fine arts (MFA) acting students focused on parental and personality influences on the choice of acting as a profession, but goals to change emotions in themselves or others were practically ignored (Kogan, 2002). Yet, artists commonly assert that art helps them to contain, express, and understand their emotions, and such claims are the basis for much of art therapy, where art creation is used to evoke and make emotions cognitive (Schouten et al., 2015). Art educators have also long advocated that making art confers advantages in terms of autonomy for making meaning of, and expressing, inner worlds (Sheridan et al., 2022).

Attentional Deployment

After choosing to attend, art may impact emotion because art can be, simply, engaging. It captures and holds attention (when it is good art, or even really bad art). Early empiricists of emotional responses to art, such as Berlyne and Boudewiins (1971) focused on attentional processes, such as complexity, novelty, uncertainty, and conflict, to explain the nature of emotional arousal in response to art. Across art forms, designers, writers, and directors all try to focus audiences' attention in accordance with themes and stories to be communicated. As an audience member, one might choose to attend to a piece of art simply to have one's attention focused on it rather than an emotion-eliciting situation in one's own life (i.e., distraction).

The degree to which art captures attention is often referred to as absorption. More specifically, transportation, one aspect of absorption, refers to the degree someone feels present in the world of a narrative or performance (Green et al., 2004). When absorbed into an art piece unrelated to one's own emotion-eliciting situations, more absorption would indicate more effective distraction. Of course, the content of art may also parallel emotion-eliciting situations from one's own life, and the resulting absorption or transportation would result in increased emotion (e.g., listening to sad music after a breakup).

Other forms of attentional capture, such as the perceptual (visual) and conceptual processing fluency (ease) of objects, have been long linked to aesthetic responses, such as awe and pleasure. The more quickly and readily perceivers can cognitively process a work of art, the more likely they are to have an immediate, positive, emotional reaction. Perceived novelty, complexity, and uncertainty in a work of art all interact to affect emotional response. This includes having outside information about the art, such as an easy-to-understand title (Forster, 2019; Silvia, 2005).

For artists, the attentional mechanisms at play for the audience are even more potent. Most artistic creative endeavors involve specialized skills requiring focused attention. Therefore, absorption in artistic practice can have a regulatory effect on any emotions unrelated to the art. Some forms of artistic training include skills in containing or

compartmentalizing emotions unrelated to the art from the creative process. Especially during training, the attentional requirements of artistic endeavors are likely to lead to states of “flow.” In visual art and poetry, distraction from an emotion through writing or drawing a nonemotional work of art has been shown repeatedly to activate flow and alter emotional states (e.g., Fink & Drake, 2016). Furthermore, some art forms, such as acting, actively train artists to be at least somewhat transported into the world of the narrative. This is often a dual task, asking artists to, at the same time, be present in the world of the narrative and in the world in which they are creating art (e.g., Cornford, 2014). Dual tasks increase the difficulty of the task of creating art, likely increasing attentional effects.

Cognitive Change

Classic theories of cognitive appraisal and its role in experiences of art have also been applied to empirical aesthetics, abolishing the assumption that all works of art cause the same emotions in the perceiver, or that aesthetic emotions can be separated into merely liking or disliking (Silvia & Brown, 2007). Different art forms engage common and distinct influences on appraisal. One may be the use of psychological distance, or perspective (Menninghaus et al., 2017). Specific tactics engaged to reappraise emotional situations frequently invoke psychological distance, resulting in diminished emotional responding, especially of negative emotion (Abraham et al., *in press*).

Art influences multiple types of psychological distance. Compared to “real-world” emotions, art forms invoke physical distance: use of perspective in visual art or separation of audience from performers. A fictional frame in film or novels also invokes hypothetical distance, often referred to as suspension of disbelief. Representational distance, the degree art is realistic versus symbolic, contains multiple signals that depicted events are separate from the reality of the audience. By increasing distance (and decreasing emotion), this may allow the viewer to “embrace” the work of art, and allow for emotional up- and down-regulation (Menninghaus et al., 2017). These varieties of distance may force new perspectives, with novelty, background knowledge, and representational form working together to shift how a viewer understands the subject of the art.

Audience members may experience the cognitive mechanism of an increased sense of perceived control. Previous experience and artistic norms create reassurance that what is being portrayed artistically is curated, and there is an assumption that the artistic team is taking some care to protect the experience of its audience members, to guard against unmitigated distress. Expectations about how stories are resolved in artistic settings make it more likely that audience members will experience some kind of resolution of conflict by the end of the experience. Even when working with terrible topics, artists who work in narrative forms of art “make sense of” emotional events by knitting them into compelling narratives. Makers of horror movies or political theatre about genocide, for example, mean for their art to be taken in a reflective way and spur action through the audience’s sense of upset, rather than to leave them devastated for the point of devastation.

The increased sense of perceived control at play for the audience is enhanced even more for the artists creating, shaping, and executing the art. Consistent with the emotion regulatory effects of redemption narratives (McAdams & Bowman, 2001), or therapeutic narrative rescripting (White et al., 1990), filmmakers and writers often discuss their artistic process as a way to cognitively process and express meaningful emotional events. Some art training (e.g., much of modern acting) focuses on exercises to cultivate

mindfulness, cognitive control, and perspective taking, rather than the simple ability to increase or maintain strong emotions (Goldstein & Winner, 2012).

Response Modulation

Once a work of art causes an emotional response in its viewer or creator, there are often expressive norms guiding audience behavior, which vary by culture (Matsumoto et al., 2008). For example, within North American professional artistic venues, audience members are typically quiet. While facial expression of emotion is permitted, large-scale physical behaviors are not common, and in some cases, cause for removal (Sedgman, 2018). To extend experimental findings, this likely results in diminishing felt positive emotion (Fernandes & Tone, 2021), but may not change (and might increase) some aspects of negative emotion responding (Tull et al., 2010). In contrast, the shared experience of a live audience may at times increase emotional responses (Kaltwasser et al., 2019), and performance art, rock concerts, and immersive theatre often demand expression from their audiences. These conflicting influences are a broad avenue for future work in felt and expressed emotions in response to art.

Art also has direct effects on experienced physiology. For example, there are multiple mechanisms through which music has been demonstrated to affect physiological responses, such as chills, goosebumps, and other forms of physiological skin arousal, even for music outside of the listener's culture (Beier et al., 2022). A great number of purported mechanisms by which music induces emotion are thought to occur outside of conscious awareness, such as low-level, brainstem-mediated physiological responses to low-level acoustic properties of sound, or emotional contagion of the perceived emotion in music (Juslin et al., 2010).

Many have long assumed that artists, and actors specifically, are skilled at up-regulating expressions of emotion, whether or not they are connected to authentic emotional experiences. Actors have even long been used as psychological stimuli of emotional expressions (e.g., Levenson et al., 1990; Le Mau et al., 2021), but actual measurement of actors' emotional experience is less common. In one large cross-cultural study, Konijn (2002) found that actors are more focused on their own evaluation of how spectators are responding and adjusting their performance style, than experiencing particular emotions in the moment. Different acting training techniques focus on regulating appraisals, experiences, or expression of emotion, but the ultimate goal of acting is to communicate an experience, belief, or emotion effectively to an audience. Acting training also values the expression of emotions of all kinds—positive and negative—and quasi-experimental developmental work has shown acting training is associated with lower levels of expressive suppression in everyday life (Goldstein et al., 2013).

Increasing the expression of negative emotions through the creation of art (i.e., venting, catharsis) has long been theorized as adaptive—however, direct experiments using art as a distraction technique versus to express current emotions—find repeatedly that distraction is a better regulatory technique than expression for decreasing negative and increasing positive mood (James et al., 2018). Therefore, while emotional expression itself does not appear to down-regulate negative emotion, it may be that artistic training of many kinds builds skills in regulating expression more broadly. Furthermore, skill in both increasing and decreasing the expression of emotion may build mindful awareness and acceptance of a wide variety of emotional states, rather than increased expression leading simply to resolution of the expressed emotion.

Conclusion

Applying an emotion regulation framework to experiencing and creating art offers arts and affective science researchers specific mechanisms by which art may impact goal-directed emotion management. This perspective moves beyond “art makes us feel” and identifies specific ways in which art may result in increases or decreases in emotions, in audience members or artists. There is a small but exciting empirical literature examining these questions, which are often formulated differently depending on the perspectives of the artist, researcher, domain of art studied, and age of participants. The fields of empirical aesthetics, creative arts therapies, and art education have long referenced emotion regulation as one way to explain the effects of engaging in art. Affective scientists, too, may want to look to the arts as a way to deepen, apply, and expand their understanding of emotion regulation.

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