Steven I. Pfeiffer *Editor*

Handbook of Giftedness in Children

Psychoeducational Theory, Research, and Best Practices

Second Edition

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Preface

The first edition of the *Handbook of Giftedness in Children* was published 10 years ago, in 2008. At the time, contributors to the Handbook recognized that there was a growing concern in American society that the gifted and talented were an underserved and even unserved special-needs population. In the Preface to the first edition, I noted, as editor, that the great majority of psychologists and educators—and other healthcare providers—were ill equipped to meet the unique and challenging needs of the gifted and talented. Much has changed in 10 years. The discouraging fact remains, however, that gifted and talented children and youth, both in the USA and globally, are an often misunderstood and frequently unserved special-needs population. This is a primary reason why the publisher and I undertook to publish, 10 years after publication of the first edition, an updated second edition of the Handbook.

A second reason for publishing a second edition is the fact that there is much new science to share that has appeared over the last 10 years. My hope and expectation is that these new scientific findings and new thinking across multiple domains infuse gifted education and the gifted field with fresh ideas and different challenges, and alternative ways to think about giftedness and talent development.

This second edition combines the disciplinary perspectives and research findings of those authorities on the front lines of research and practice. With the success of the first edition, it was relatively easy for me to approach the leading experts across many different fields and secure their enthusiastic support to contribute to this second edition. In fact, the scholarly work of experts across a wide range of fields is well represented in this second edition. In planning for the second edition, I intentionally broadened the net to include experts from fields typically outside of gifted education. For example, I invited authorities in the fields of human expertise and individual differences, perfectionism, emotional intelligence, suicide and depression, and career counseling to contribute chapters on their work. My only requirement was the challenge that they provide, in their chapters, linkages to the world of the gifted.

With the second edition, I also invited authors from outside of the USA to help provide a more international and nuanced perspective on giftedness and gifted education. I also requested that each contributor consider including cross-cultural factors that might be worth mentioning in their respective chapters. I hope that the reader will quickly appreciate that each chapter provides a succinct, contemporary, highly readable, and authoritative summary of important material related to better understanding the world of the gifted.

The editorial staff at Springer have been exceedingly gracious and supportive in bringing the second edition to press in a professional and timely manner. Particular thanks go out to Judy Jones, whom I have worked with and respected for over a decade, and to Michelle Tam, who was a valued resource on the second edition.

Finally, I would like to acknowledge my wife. I extend my heartfelt gratitude and appreciation to Jan Pfeiffer for her support and encouragement. Her continuing patience and willingness for me to sacrifice family time while I worked on the second edition was a generous gift. Thanks, also, to my doctoral students at Florida State University. As a group, they continue to inspire, challenge, enable, and keep me intellectually honest and up-to-date with the most recent research in the field. I owe them much appreciation for keeping me passionate about the gifted field.

Tallahassee, FL, USA Steven I. Pfeiffer

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1 A History of Giftedness: Paradigms and Paradoxes

David Yun Dai

Abstract

Any field of research has its core concepts that define the nature of a set of phenomena under investigation as well as determine the methodology of studying these phenomena. In history, the term "gifted" (or "giftedness") is not only used descriptively to characterize some superior performance or outstanding accomplishments but also explanatorily to point to certain personal qualities responsible for this kind of performance or accomplishments. As our understanding of such performance and accomplishments changes, what "gifted" means also changes. Furthermore, our view of what gifted education can do to identify or promote these qualities also changes accordingly. In this chapter, I delineate the evolution of giftedness and gifted education as one that has gone through paradigm changes since the inception of the field. Existence of multiple, competing paradigms has created paradoxes in the sense of ascribing multiple meanings to the very concept of giftedness, neither of which can be claimed correct or incorrect. I conclude the chapter by arguing that only by going beyond giftedness can we resolve the paradoxes.

The significant problems we face cannot be solved at the same level of thinking we were at when we created them.
—Albert Einstein

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Conceptions of giftedness, broadly defined, date back as early as Plato (see Grinder, 1985), but systematic thought and research devoted to this topic was a relatively recent event, and has been developed along with modern psychology. Early pioneers included Francis Galton and Alfred Binet (see Robinson & Jolly, 2014), among others. In the American history, with Terman's (1925) study as the onset, the quest for the nature and consequences of giftedness has lasted for a century, and is still going on. The search for the locus of giftedness is also a search for the identity of a burgeoning field of studies that has yet to define its domain and defend its credibility. In this chapter, I first provide a historical-theoretical account in an attempt to capture the essence of what is seen as "gifted," and identify and articulate the main thread of the intellectual history of giftedness, which can be characterized as resolving around three core elements: person, development, and context. Then, I delineate major paradigms of gifted education that is meant to serve gifted and talented students and facilitate their optimal development through carefully designed education provisions. Finally, I propose a new direction in the field that can help us

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resolve the conceptual difficulties of identifying the locus of giftedness and move toward a new era of gifted education.

The Paradigms and Paradoxes of Giftedness

The locus and origins of giftedness turn out to be more elusive and complex than the founding scholars expected. As a result, the history of the search for giftedness can be defined as an ever increasing conceptual sophistication. In the following section, I delineate this historical process as going through four stages of development: conceiving, broadening, and refining the concept of giftedness, and exploring new frontiers, and summarize this history by identifying nine essential tensions revolving around the concept of giftedness, which are ontological, epistemological, and normative in nature.

The Conceiving Years: The Essentialist Paradigm

Theoretically and technically, the starter of this quest was Francis Galton (1869). Galton made a minimalist (and often radically reductionsitic) assumption of the nature of high potential (i.e., there is some kind of genius "genes" at work, accounting for superior accomplishments of a few individuals). He also invented measurement techniques crucial for later development of psychometrics. Furthermore, his mathematical maneuvering of data to find discernable patterns and regularities led to heritability estimates critical for the claim of genetic contributions to human potential. Giftedness as conceived in the beginning of twentieth century also heavily relied on psychometric intelligence theory based on the discovery of a shared component in a variety of subtests, dubbed *general intelligence* or Spearman's "g" (Spearman, 1904). However, this more technical construal of intelligence was not what Galton initially had in mind. Galton (1869) had this to say:

> By natural ability, I mean those qualities of intellect and disposition, which urge and qualify a man to perform acts leading to reputation. I do not mean capacity without zeal, not zeal without capacity, not even a combination of both of them, without an adequate power of doing a great deal of very laborious work. (p. 33)

In hindsight, Galton's conception of "natural ability" can be criticized on the ground that the three constituent qualities he identified must be separate things coming together in a particular context or at a particular developmental juncture (Renzulli, 1986; Simonton, 1999), rather than an innate, unitary capacity or structure, as he suggested. Nevertheless, the notion that the making of giftedness takes capacity, passion, and the commitment to hard work has proven to be a deep insight still meaningful today (see Lubinski, 2004).

Terman (1925) and Hollingworth (1924, 1942) were both strong believers in giftedness as manifested in high IQ performance. They started a tradition of treating giftedness as a unitary core of high general intelligence that sets the "gifted" apart from the rest of age peers, not only in terms of high facility in intellectual functioning but also in its profound ramifications for the individuality of persons so identified, such as different ways of thinking, different social-emotional characteristics, different educational needs, and unique developmental trajectories and pathways. This conception was further strengthened when Dabrowski, trained in developmental psychology in Europe, was later introduced to the American audience (see Ackerman, 2009). To be sure, Terman (see Terman & Oden, 1959) later realized that, within the high IQ group he studied, there were individual differences in motivational and emotional characteristics (translated into today's language, self-efficacy, and goal-directedness, etc.) that contributed to differential achievements decades later. However, the basic premise of high IQ individuals as a homogeneous group remains intact (Terman, 1954). For Hollingworth, who studied a group of children with extremely high IQs, their unique, exceptional social-emotional needs became a focal point.

In addition to this homogeneity assumption, these early advocates of giftedness also considered this quality to be permanent; that is, giftedness is a quality of the person that holds its identity, unity, and continuity across situations and over time. Thus, once a child is identified "gifted," this child will always be gifted. Here is the logic: the IQ test (at the time, Stanford-Binet) measures one's intellectual capacity, and this capacity, being part of natural endowment, will be with the child forever, regardless of life circumstances or developmental changes. Taken together, the core assumptions of *homogeneity* and *permanence* are underlying what I called the essentialist tradition in conceptions and theories of giftedness (Dai, 2010). We might also see this tradition as a mainstream paradigm of giftedness. Paradigm, broadly defined, is a system or framework of thought and practice widely accepted by a community of practitioners or professionals as the standard, coherent in its organization, and distinct compared to competing frameworks (see Dai & Chen, 2014 for more discussion).

There were challenges within the psychometric tradition as to whether there are other kinds of giftedness. Getzels and Jackson (1962) argued for the creatively gifted as a separate category of giftedness, though the data they provided is far from convincing, as the creatively gifted they identified also had a high average IQ (127, to be exact; see Borland, 2014, for more discussion). Torrance (1966) created his own now famous creativity tests aimed at identifying the creatively gifted. Regardless of their differences, early pioneers had strong convictions that giftedness sits in the person or person's head, and that it is homogenous (hence the sharp distinction between the creatively gifted and the intellectually gifted) and permanent (a highly stable trait that distinguishes itself from achievement or developmental outcomes). This essentialist tradition with its assumptions of homogeneity and permanence, however, is currently challenged on theoretical (e.g., Simonton, 2005) and technical (e.g., Lohman & Korb, 2006), as well as scientific, ethical, and practical grounds (see Borland, 2003; Dai, 2016, for critiques). Dissatisfaction also comes from the fact that the initial claims Terman (1925) and other advocates made about the power of general intelligence as measured by the IQ tests in predicting future achievement are exaggerated, to say the least (see Borland, 2014; Subotnik, Olszewski-Kubilius, & Worrell, 2011), leading to a search beyond the magic "g" (Spearman, 1904) for explanatory factors.

Broadening the Concept and Switching the Focus: The Rise of the Developmental Paradigm

There has been recognition in the field that giftedness means potential for outstanding achievement; between potential and achievement is talent development. Tannenbaum (1983) asserted that.

> Keeping in mind that developed talent exists only in adults, a proposed definition of giftedness in children is that it denotes their potential for becoming critically acclaimed performers or exemplary producers of ideas in spheres of activity that enhance the moral, physical, emotional, social, intellectual, or aesthetic life of humanity. (p. 86)

Other scholars pointed out that giftedness can be indicated either by indicators of potential based on their predictive efficacy as well as real achievement in terms of high-level domain performance or accomplishments (Siegler & Kotovsky, 1986; Mayer, 2005). Thus, criteria for determining giftedness do not have to be based on what one presumably possesses (e.g., a capacity or a fixed amount of potential); it can instead be based on what one has accomplished through talent development. In other words: giftedness includes "doing" as well as "being."

A major shift in conceptions of giftedness occurred sometime in the 1950s. Dissatisfied with the rigidity of IQ-based definition of giftedness and the essentialist construal of giftedness, Witty (1958), argued for a more inclusive definition of giftedness:

> There are children whose outstanding potentialities in art, in writing, or in social leadership can be recognized largely by their performance. Hence,

> we have recommended that the definition of giftedness be expanded and that we consider any child gifted whose performance, in a potentially valuable line of human activity, is consistently remarkable. (p. 62)

In this new definition, not only were domains broadened to include artistic and social endeavors, but criteria for determining giftedness were also shifted from test scores to authentic task performance (see also DeHaan & Havighurst, 1957). More important, however, is the logic underlying this new definition. Witty felt that, in conceptualizing giftedness, the importance of "capacity" was over-emphasized and "zeal" (or drive) underestimated, to use Galton's terms (see Jolly & Robins, 2014). An emphasis on "performance" rather than "capacity" reveals Witty's practical wisdom of not making a sharp, unwarranted distinction between what is "capacity" or "aptitude" and what is "achievement," a strategic move in historical hindsight (see Lubinski, 2004). By emphasizing performance, the new conception of giftedness legitimized authentic task performance as evidence of giftedness, and made room for motivation to play a role. It is a not accidental that, while earlier pioneers like Galton, Terman, and Hollingworth were more keen on identification, Witty paid greater attention to providing appropriate educational opportunities to develop leadership and creativity in gifted students. Thus, the balance of nature and nurture was readjusted in the mid-twentieth century.

The first "official" definition issued by the Office of Education in the USA (Marland, 1972) bears a resemblance to Witty's (1958) definition. In the Marland Report:

> Gifted and talented children are those… who by virtue of outstanding abilities are capable of high performance…Children capable of high performance include those who have demonstrated any of the following abilities or aptitudes, singly or in combination: 1) general intellectual ability, 2) specific academic aptitude, 3) creative or productive thinking, 4) leadership ability, 5) visual and performing arts aptitude, 6) psychomotor ability (p. ix).

The Marland definition, like Witty's, broadened the construct of giftedness definitively, and made it more inclusive. However, it also created unexpected problems. It is a convenient taxonomy, and the listed categories are not mutually exclusive, nor, indeed, rigorously and consensually defined. For example, leadership has a social as well as expertise/creativity dimension and can manifest itself across domains; creative (or productive) thinking is not a domain of its own but a process that can be manifested in all domains of human activity. Such a convenient list could mislead educators into believing that it represents a scientifically justified typology of giftedness.

Witty's (1958) influence can also be seen in Renzulli's (1978, 1986) three-ring theory, which was a culminating point in the Broadening Stage. The most obvious of this influence is the articulation of motivation (task commitment) as integral part of giftedness. What was more revolutionary, however, was a view of giftedness as a relative state that happens to some individuals at some times in some places, rather than an "absolute concept" (Renzulli, 1986, p. 62), structurally permanent and functionally pervasive. In this anti-essentialist spirit, Renzulli prefers to focus on "gifted behavior" (p. 63) about which we can do something, rather than "giftedness" as an entity sitting in the head. The three-ring theory introduces developmental timing and contextual factors in explaining how giftedness as a critical state occurs when above average abilities, domain-general or domain-specific, are brought to bear upon a task at hand through task commitment, eventually leading to some expression or product judged to be novel and valuable for its purposes (i.e., creative). Moreover, the theory stipulates a more distinct role of nurturing gifted behavior than previous models and theories, as it postulates task commitment and creativity as contextually shaped and more malleable than basic abilities. Three-ring theory was the first developmental rendition of giftedness. It inspired a more explicit developmental conception of giftedness in Europe (Mönks & Mason, 1993). However, It deviated so much from the essentialist construal of giftedness that after many years of its publication, it remains controversial (see Renzulli, 1999). The essentialist construal of giftedness (i.e., homogeneity and permanence) dictates that giftedness should be a capacity or capacity-like, not a developmental state, and that

task commitment and creativity are too contextually varied and malleable to be qualified as constituents of giftedness.

A view of giftedness not as a static quality in the head (i.e., capacity), but as a result of the confluence of several forces, endogenous and exogenous, coming together in the right place at the right time, was a major shift in focus, from treating giftedness as a simple matter of individual differences to seeking a deep understanding of how exceptional competence comes about in context and further evolves. This developmental orientation opened a new horizon for understanding the nature and nurture of gifts and talents.

The second half of the twentieth century can also be characterized as a domain-specific turn in conceptions of giftedness. Gruber's (1981) biographic research on Darwin, Bloom's (1985) interview studies with eminent young scholars and artists, Feldman's (1986) research on child prodigies in math, art, and chess, among other domains, and Csikszentmihalyi, Rathunde, and Whalen's (1993) research on artistically and scientifically talented adolescents, taken together, laid a new foundation for understanding origins of giftedness, talent, and outstanding accomplishment. Theoretically, Feldman (1994, 2003) pointed out that cognitive development in one way follows a universal path, as Piaget suggested, but in another way follows distinctive individual developmental trajectories and pathways based on one's propensities and inclinations vis-a-vis environmental opportunities. There is a universal–unique continuum in human ontogeny (i.e., individual development). By incorporating mainstream developmental psychology, the notion of giftedness found its new foundation in life-span development.

There were also efforts by the advocates of the traditional psychometric theories of giftedness to forge an integration of differential and developmental approaches. Ziegler and Heller (2000) defined giftedness as a tipping point when developmental conditions are optimal to allow some individuals to demonstrate this superior quality. Robinson, Zigler, and Gallagher (2000) looked at the two tails of the intelligence spectrum, the intellectually challenged and intellectually gifted. They argued that the intellectually gifted go through more developmental stages, a conjecture consistent with the recent brain research showing that high IQ subjects have a prolonged cortical development than subjects of the normal IQ range (Shaw et al., 2006). True integration of differential and developmental approaches awaits a new force of integration that shows how the domain-general and domain-specific resources come together developmentally vis-à-vis environmental opportunities and challenges to shape the person's unique trajectory and pathway called *talent development*.

Refining the Concept: The Developmental-Contextual Paradigm

As suggested earlier, in the history of giftedness, scholars have been wrestling with the issue of competing claims, from the person accounts and the developmental and contextual accounts, from the domain-general accounts and domain-specific accounts. Resolving this conundrum takes a new tack. One has to remap the parameters. Tannenbaum (1997) brought people back to the drawing board, and created a new road map of the gifted land: who (producer vs. performer), what (thought, artistry, or service), and how (proficiency vs. creativity). Simonton (1999, 2005) mapped out the main parameters developmentally in his emergenic–epigenetic model of talent development.

According to the emergenic–epigenetic model, giftedness or talent is relative to the nature of a given domain that offers a specific set of opportunities and challenges to an interested person. Whether gifted behaviors will emerge depend on (1) whether the domain involved is simple or complex, (2) whether the person in question has the right combination of genetic components vis-à-vis the domain, (3) whether these functional components for the domain operate at an additive or multiplicative fashion, and (4) whether all the components relative to the domain come into place (i.e., developmentally matured) at the right

time. In other words, what kind of giftedness will emerge is not prespecified or preordained in biology but determined by a combination of multiple factors: *person* (biology), *domain* (culture), *social context* (opportunities and age peers), and *developmental timing* (epigenesis). The model also predicts that gifted behaviors are not a constant but can emerge and disappear, depending on individuals' developmental timing, opportunities for sustained engagement, and related population characteristics.

Dai (2010; Dai & Renzulli, 2008) proposed *flexible agency*, *participation*, and *increasing differentiation,* among others, as major tenets of individual development. Thus from a differential-developmental point of view, giftedness as outstanding performance or behavior is an emergent, changing property of person–environment interaction that grows and becomes more differentiated over time. This formulation attempts to solve the tensions between the person accounts (essentialism) and contextual-developmental accounts (developmentalism), between domain-general and domain-specific accounts (see Pfeiffer, 2013, for a similar effort in his tripartite model of giftedness).

Using a neo-Piagetian approach, Porath and colleagues' research shows that domain-specific differential development (emerging talent) starts very early (in preschool years, in mathematics and writing, among others), though constrained by the working memory capacity (see Porath, 2006). Working memory capacity has both individual difference and developmental underpinnings that constrain performance in terms of cognitive efficiency. Cognitive sophistication (metacognitive awareness and control) is another possible domain-general mechanism that facilitates domain-specific development (Dai, 2010; see also Miller, 2005). Extending this research beyond childhood and adolescence, Horowitz, Subotnik, and Matthews (2009) provided a life-span developmental perspective on giftedness that further elaborate on giftedness as a dynamic, developmentally changing state, with different challenges and opportunities at different points in individual development. Together, they provide an integrated, unified understanding of gifted behavior and talent manifestation.

New Frontiers: Contextualism vs. Individualism

Compared to the zeitgeist of the beginning of the twentieth century, when Spearman (1904) declared that general intelligence is once and for all "objectively determined and measured" (p. 201), the zeitgeist of the twenty-first century is completely different. For better or for worse, it favors social-contextual accounts and dismisses individual difference accounts of giftedness, reflected in popular media such as Gladwell's (2008) best seller "Outliers, and" Daniel Coyle's (2009) book titled "Talent Code."

American scholars tend to be polarized when it comes to the nature–nurture issue, but in the new century, the pendulum is swinging to the nurture side. Ericsson's (2006) influential research on expertise, and Weisberg's (2006) research on eminent scientific creativity lend support to the idea that alleged gifts and talents for high level accomplishments are exaggerated; even their existence is scientifically questionable (Howe, Davidson, & Sloboda, 1998). They highlighted the role of dedicated effort and deliberate practice, and downplayed the importance of talent or giftedness. A more radical view can be seen in a new wave of contextualism that stresses the nature of human intelligence and creativity as fundamentally situated (hence contextual), distributed (between the person, tools and resources available), and collective (co-constructed with others), rather than reflective of individual characteristics (Sawyer, 2012). According to a "relational ontology" (Gresalfi, Barab, & Sommerfeld, 2012; p. 42), intelligent behaviors arise from (1) the nature of the task that frames activity, and tools and resources that support activity; (2) recognized and valued norms and rules that shape particular activities; and (3) personal history and dispositions of the learner. In other words, to understand outstanding performance, one has to understand the context that shapes the performance. This is how the focus on giftedness is shifted to from person

to context (Barab & Plucker, 2002; Plucker & Barab, 2005).

Ziegler's (2005) Actiotope Model of Giftedness is in spirit closest to this new wave of contextualism in its emphasis on situated action with all the supporting tools and resources, action repertoires developed through action, as well as "subjective action space," with aspirations, intentions, and goals. A major departure of this new contextualism is that it no longer treats person and environment as separate entities but see them as an undividable functional unit. If the developmentalism focuses on "giftedness in the making," (Dai, 2010, p. 196), this new contextualism goes one step further and locates giftedness squarely in action and the functional relationship and interaction with some aspects of the world.

To summarize various competing claims and arguments in the field of gifted studies, Dai (2010) delineate nine ontological, epistemological, and normative tensions or "antinomies," to use Immanuel Kant's terminology (see Table 1.1), consisting of a set of thesis and antithesis.

Of the tensions identified in Table 1.1, ontological tensions reveal differing convictions or competing arguments about the nature and sources of human potential for outstanding contributions in a variety of domains of cultural importance. These convictions or arguments drive their conceptualizations and research agendas. Epistemological tensions reflect differing beliefs and positions regarding evidential basis of knowledge claims and the methods of identifying and understanding the nature and development of giftedness. To some extent, the epistemological tensions are derived from ontological tensions as well as perpetuating specific ontological convictions. Thus, the gifted-nongifted trait comparison research further solidifies the claim of qualitative differences between the gifted and non-gifted, hence the legitimacy of the gifted-nongifted bifurcation in education practice. Conversely, developmental research shows the changing and evolving nature of competence, thus in favor of developmental and contextual accounts of giftedness. Generally speaking, the paradoxical nature of the "antinomies" in the field of gifted studies resemble those in physics, for example, debates about the nature of light as particle vs. wave; some methods reveal particle-like properties, and others wave-like properties. To push this parallel further, particle accounts reveal a reductionist bias just as wave account reveal a holistic bias. In comparison, the normative tensions arose partly from ontological convictions and epistemic stances, and partly from values and priorities: what is considered optimal and ideal conditions. The normative concerns and goals lead to the next topic: gifted education.

Paradigms and Paradoxes of Gifted Education

In the above account of the history of giftedness, the vantage point is psychological. However, various conceptions of giftedness occurred in educational contexts as part of practical endeavor known as gifted education. Discussing this context is necessary for intellectual and practical reasons. For one, discourse on giftedness often takes place in the context of gifted education; giftedness becomes meaningless if deprived of its practical context. For another, specific approaches to gifted programming typically explicitly or implicitly embraces a particular viewpoint regarding the nature and nurture of giftedness; uncovering the hidden assumption is useful if we are to make our educational discourse intelligible and intelligent.

At the core of a paradigm of gifted education is a view of what "giftedness" means, and what we can do about it. The former concerns the psychological dimension of the nature and nurture of gifts and talents; the latter involves a normative dimension in terms of priorities and values we embrace, which is not a true or false question that can be answered empirically but has to be negotiated and endorsed among its stakeholders. At the theoretical as well as practical level, gifted educators have been searching for unique curricular and instructional identity for gifted education (Ward, 1961; see also Borland, 1989; Kaplan, 2003; Tomlinson, 1996). As we shall see, what "giftedness" means has deep implications as to what we can

Table 1.1 A summary of major tensions and themes in the field of gifted studies

Ontological tensions	
(1) Being versus Doing/Becoming	
Giftedness is possessed; giftedness is biologically constitutional, an enduring personal quality that ultimately explains gifted behavior and outstanding achievement over time.	GiftednGiftedness is achieved; giftedness is an emergent property and functional state of person–environment transaction and interaction, and a result of learning, practice, and social and technical support, subject to further development and change.
(2) Domain-general versus domain-specific	
Giftedness is not inherently confined to any single domain, because general cognitive abilities can be flexibly channeled and utilized in multiple ways, depending on environmental circumstances and motivations.	Giftedness is domain-specific, because each domain has its own unique set of demands in terms of sensitivities, inclinations, and abilities, which are tuned to a particular set of objects, symbolic meanings, and underlying relationships.
(3) Qualitative versus quantitative differences	
Gifted individuals are different from their average peers *in kind*, because the structural and functional organization of their minds is different, and their developmental trajectories are unique.	Gifted individuals differ from their average peers only *in degree*, because they only show relative strengths and advantages rather than absolute ones.
Epistemological tensions	
(4) Aptitude test versus authentic performance	
Potential for excellence (i.e., giftedness) is best evidenced in performance conditions that can differentiate high potential (aptitude) from high achievement.	We will never know whether a person is "gifted" or holds unusual "potential" unless the person demonstrates superior mastery of skills and knowledge in an authentic domain or functional context.
(5) Nomothetic versus idiographic	
Manifestations of gifted behaviors are subject to a set of hidden but universally valid laws and principles; therefore, we can determine who are gifted and how the gifted develop by applying these universal rules and principles.	Manifestations of gifted behaviors are diverse and unique phenomena, and have their own underlying logic, not subject to predetermined universal principles; therefore, the uniqueness of each manifestation needs to be closely examined in order to shed light on its nature.
(6) Reductionism versus emergentism	
The complexity of gifted manifestations can be explained by simpler components at a more basic level of analysis; higher-level phenomena can be causally reduced to lower-level components, structures, and processes.	The complexity of gifted manifestations reflects higher-order organizational principles in the organism and functional regularities that are context-dependent, and there are emergent properties that cannot be reduced to isolated lower-level components.
Normative tensions	
(7) Expertise versus creativity	
High-level expertise (proficiency) in a given domain should be the hallmark of giftedness and goal of gifted education, because only this form of excellence can be scientifically verified, and educationally promoted.	Creative productivity (innovation) should be the hallmark of giftedness and goal of gifted education, because giftedness is not about mastery of the already known, but exploring, discovering, and inventing the unknown.
(8) Gifted child versus talent development	
Gifted children should be the center of our focus and the sole rationale for the existence of gifted education; their special educational needs and unique patterns of personal growth should the driving force in educational programming and intervention.	The evolving process of talent development should be the central focus of gifted education; gifted education should provide maximal opportunity for those who show manifest or emergent talents and are interested in developing their talents to the fullest of their capacities.
(9) Excellence versus equity	
Identifying and cultivating high potential for excellence is a society's responsibility for the welfare of individuals as well as the society at large. Developing excellence reflects a cultural value that is important for a viable democracy and advances in human civilization.	Singling out the alleged "gifted" for special treatment and privileged access to opportunity to pursue excellence perpetuates existing social inequality, and creates a new social "elite," thus violating the democratic principle of equal rights and opportunity.

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do about it. If giftedness is about the person, the focus will be on identification and targeted interventions; but if giftedness involves development and context, and if qualities we deem "gifted" are malleable, practical strategies would be completely different. In the following section, I delineate a history of gifted education in terms of paradigms and paradigm shifts, parallel to the development of the concept of giftedness sketched earlier, largely based on the three-paradigm framework I developed (Dai, 2011; Dai & Chen, 2013, 2014) as a general guide (see Eyre, 2009, for a similar effort).

Paradigms and Paradigm Shift

Dai and Chen (2013, 2014) defined a paradigm of gifted education in terms of how programming addresses the questions of What, Why, Who, and How, pertaining to both theoretical foundations and practical approaches. Each paradigm is distinct regarding (1) *What* is the nature of giftedness, (2) *Why* we need gifted education, (3) *Who* are gifted and how we get to identify them, and (4) *How* we educate them, and what strategies and methods are viable and effective? (see Table 1.2)

From an educational point of view, Terman (1925) and Hollingworth (1942) can be seen as two leading historical figures who laid a solid foundation for what I called the Gifted Child Paradigm in the inception years of the gifted education movement, because they held the same strong conviction that giftedness as evidenced by high IQ scores is genetically determined and sets children so identified apart from the rest (i.e., homogeneous and permanent); what naturally followed was a *categorical approach* to gifted education; namely, by being "gifted," they warrant an education uniquely suited for them (Delisle, 2002, 2014; Gallagher, 2000).

In terms of purposes of gifted education (the question of Why), however, Terman and Hollingworth held somewhat differing views. Borland (1989) identified in history two *raisons d'etre* of gifted education: a special-education

Table 1.2 Major points of differences between and among the three paradigms

		Paradigm	
Dimension	Gifted child	Talent development	Differentiation
Assumption "What"	Essentialism; exclusive categorical assumption; status definition; permanent, context-free exceptionality with regard to general ability assumed	Developmentalism; talent diversity assumption; malleable status; increasingly differentiated aptitudes for a particular domain; exceptionality not assumed	Individuality assumption; emergent needs for differentiation; context dependency of exceptionality
Purpose "Why"	Serving the gifted; thinking and leadership qualities as the goal	Supporting domain excellence and innovation; modeling after authentic professions and creativity	Diagnostic focus; responding/serving manifested individual needs within the confines of schooling (e.g., main school subjects)
Targeted students "Who"	Classification based on psychometric measures of superior mental qualities	Selection/placement based on aptitudes for a particular domain	Diagnosis of strengths and needs for educational purposes in a particular educational context
Strategy "How"	Programs assumed to be uniquely suited for the gifted; pull-out and self-contained programs as service models	Various enrichments, authentic learning, and mentorship across school, home, college, and community as service models	Appropriate pacing of learning progression, school-based curricular and instructional adaptations and other interventions as service models

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approach, and a national-resource approach. Hollingworth (1942) placed a premium on special needs of these children. Terman held a national-resource or human capital rationale for gifted education (see Terman, 1954). Both have had a following in history: some aligned themselves more with Terman (e.g., Tannenbaum, 1983; Gagné, 1999) and others with Hollingworth (e.g., Roeper, 2006; Silverman, 1997). Indeed, the recently emerging paradigms, the Differentiation Paradigm and the Talent Development Paradigm (Dai, 2011; Dai & Chen, 2013) inherited the two orientations respectively, though the way advocates of these two paradigms conceptualize the nature of giftedness (What), the way they identify gifted children (Who), and the way they fashion their practical strategies (How) are quite different.

The Talent Development Paradigm emerged in the late twentieth century and has been gaining momentum to become a major force in gifted education. Earlier pioneers included Julian Stanley and Joseph Renzulli, among others. Both were active at practical fronts from 1970s onward, and both developed practical ideas to combat the rigid practices of traditional age-graded schooling (Stanley, 1996) as well as the rigid IQ-based categorical approach to gifted education and overemphasis on "schoolhouse giftedness" (Renzulli, 1986; see also Subotnik & Olszewski-Kubilius, 1997). Drawing upon the conceptions of multiple and multidimensional intelligences (e.g., Gardner, 1983; Sternberg, 1985), there was a surge of talent development models and research (e.g., Bloom, 1985; Gagné, 1985; Feldhusen, 1992; Feldman, 1992; Lubinski & Benbow, 1992; Maker, 1996; Passow, 1981; Piirto, 1994; Subotnik & Coleman, 1996; Tannenbaum, 1983; Treffinger & Feldhusen, 1996) that have looked at various manifestations of talent in different domains and how education can create advanced domain-specific learning experiences (e.g., through authentic inquiry and mentorship) to cultivate talent and creativity in school and optimize talent and life trajectories toward a productive and fulfilling career.

Although explicit paradigmatic prescriptions about strength-based differentiation did not emerge until recently, the notion of differentiation has been around for decades. Questioning the effectiveness of pull-out gifted programs that patched upon the regular curriculum without any systematic design, Ward (1961) argued that the regular curriculum within schools should be adapted to provide for a full-day learning environment that meets the needs of advanced learners. Robinson and Robinson (1982) proposed the notion of optimal match of educational settings for the highly able learners through providing some learning progression flexibility instead of the rigid age-graded academic placement. However, it is in the context of the full inclusion movement that the Differentiation Paradigm emerged as an important guiding framework in gifted education, as the heterogeneity of class composition makes curricular and instructional differentiation even more imperative (Tomlinson, 2014; Tomlinson et al., 2003; Coleman & Hughes, 2009). Regarding the nature of giftedness, this paradigm assumes that educational needs of advanced students only become manifest in the context of a particular juncture of development on a particular school subject and can be best met with the right diagnosis of discrepancies between mastery levels of the student and curricular offerings (Matthews & Foster, 2006). In effect, it advocates a kind of "gifted education without gifted children" (Borland, 2005, p. 1) in the sense that instructional adaptation can be made on an individual-by-individual basis without the need to label a few students as "gifted" for special service (i.e., establishing the "gifted" status) and by default designate the rest as "non-gifted" (see Peters, Matthews, McBee, & McCoach, 2013, for a similar approach called *advanced academics*).

Comparing and Contrasting the Three Paradigms

There are continuities as well as discontinuities between the old and new paradigms. The Differentiation Paradigm inherits the legacy of the Gifted Child Paradigm in its emphasis on optimal match, but with more detailed, contextualized understandings of how to adapt curricu-

lum and instruction to suit education-relevant individual characteristics and developmental changes. The Talent Development Paradigm inherits the legacy of the Gifted Child Paradigm in its emphasis on developing future leaders and major contributors on various fronts of human endeavor, but with a more pluralistic, dynamic, and developmental outlook regarding the nature of human potential and consequently the role of environment and motivation. Despite continuities with the traditional Gifted Child Paradigm, theoretical ("What" and "Why") and practical ("Who" and "How") differences between the two late comers and their predecessor are distinct. While the two late comers are not incompatible with each other, the Differentiation Paradigm is a more circumscribed, present-focused, classroom-based, practice-driven model, and the Talent Development Paradigm a broader, more ambitious (i.e., not confined to school structures and provisions), future-oriented, psychology-based framework that has been implemented in many ways at the practical level (Subotnik et al., 2011).

Resolving the Paradoxes of Giftedness and Gifted Education: Toward an Unified Vision of Talent Development

As suggested in Einstein's quote at the beginning of this chapter, it is difficult to resolve the paradoxical nature of giftedness and competing paradigms of gifted education without going beyond the conceptual trenches we created in the first place. Regardless of existing differences, the field seems to have at least reached a basic consensus: human potential is much more pluralistic, and more contextually and developmentally shaped than the founding scholars of the field believed. With this in mind, I argue in favor of going beyond "giftedness" to embrace a broader vision of not only understanding what "nature" bestows on each individual, but, more importantly, how to cultivate human potential and help create productive and fulfilling life trajectories and pathways for those showing great promise, which are beneficial to society as well as individuals. In the final analysis, understanding the nature and nurture of high potential for outstanding contributions is more important than fixing a terminology issue. A fundamental task for the field, more meaningful than that of figuring out the meaning of "giftedness," is to develop a better understanding of how someone becomes a great scientist, artist, inventor, or social leader, what their upbringings look like, and how the inner (endogenous) environment and the outer (exogenous) environment interact to produce a great life. Tannenbaum (1997) provided a useful framework. Subotnik et al. (2011) provided a framework for understanding the developmental stages, processes, and timing of talent development. I have also attempted to develop a theory of talent development (Dai, 2010, 2017) that can account for multiple developmental trajectories/pathways (involving both nature and nurture), leading to various forms, kinds, and degrees of talent, high-level expertise, and creativity. In short, the talent development perspective provides a scope of inquiry that is much broader and richer than the term "giftedness" can afford.

There are policy and practical implications for such a shift in paradigm. Defined such, gifted education would become a more open, rather than exclusive, system. Potential positive impact and benefits of this new approach can be (1) a more diverse group of students served, (2) a variety of talent trajectories and pathways accommodated to, (3) more connections to themes of the twenty-first century (creative economy, technology age, twenty-first century problems, new talent niches, four Cs), and (4) more connections to personal interests and aspirations. Many years ago, Renzulli and Reis (1991) pointed out a "quiet crisis" in gifted education regarding how well it can address the equity and social equality issues. The new approach would help gifted educators better address them (Dai, 2013). From a multicultural perspective, the new approach is more receptive to distinct strengths and values various cultures bring into play in education. After all, what we define as "gifted" is often value-laden, and therefore not culture-free (see Ford, 2011).

In conclusion, as the discourse on giftedness is deeply rooted in educational context, the central issue is how to make gifted education scientifically more compelling, socially more equitable, and educationally more productive (Dai, 2016). This entails a sound understanding of the nature and nurture of human potential that can help guide and inform gifted and talented programming. To that end, the discussion of paradigms and paradigm shifts will still be meaningful in the years to come, potentially leading to a new era of gifted and talented education.

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2 An International View on Gifted Education: Incorporating the Macro-Systemic Perspective

Albert Ziegler, Daniel Patrick Balestrini, and Heidrun Stoeger

Abstract

This chapter introduces a theoretical framework for contemplating gifted education from a macro-systemic and, in particular, cross-national vantage point. The chapter first describes a recent trend in giftedness research to move beyond the immediate environment of the gifted and presents evidence on why this shift represents a necessary extension of traditional approaches. The chapter then proposes an evaluation approach for comparing the effectiveness of gifted education macro-systems with a focus on cross-national comparisons. This approach is based on (1) a comparison of exogenous and endogenous learning resources and (2) their systemic organization with regard to fostering individual development and learning of the gifted.

Introduction

Gifted identification has traditionally been focused on the individual (Pfeiffer, 2013; Ziegler & Stoeger, 2008). Over the recent decades, however, a system-centered focus has developed that is concerned with how systems enable giftedness and excellence and how to increase their potency (Ziegler & Phillipson, 2012).

A system-centered focus is especially interesting for designers of educational and developmental programs, policymakers, stakeholders in the field of gifted education, and, of course, gifted educators. On various systemic levels, questions might frequently arise such as:

- What are the chances that students from Beijing No. 8 Middle School will win at least 20 gold medals at the International Mathematics Olympiad between 2020 and 2030?
- Which of the public school systems of the two German Federal States of Bavaria and Saxony is more effective with regard to gifted education?
- What are the chances that Singapore will maintain its leading position for the top performers (level 6) in the PISA study?
- Are the chances greater that a woman from China or Britain will win the next Nobel Prize in physics?
- Is the Russian or the Indian support system in the game of chess more promising?

Finding answers to such questions requires a decisive shift in disciplinary focus. A consideration of just the individual will not lead to useful answers. Gifted education and the development of the gifted inevitably happen in complex, dynamic

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environments (Ziegler & Stoeger, 2017). The same gifted individual might flourish in one environment and underachieve in another. In a similar vein, the same gifted provision might work perfectly in one environment, but not in another. Thus, the values, beliefs, lifestyles, material resources, opportunity structures, etc. in which a gifted individual and her or his educators live and act are vital for the success of gifted education.

The Surprisingly Short-Sighted Environmental Perspective

The environment has undoubtedly caught the attention of giftedness scholars worldwide (e.g., Gruber & Stoeger, 2014). Yet on a theoretical level its conceptualization remains largely limited to settings and systems within the immediate environment of the individual such as the family, peer group, or school (e.g., Mönks, 1995). This is also true for several recent concepts designed to theoretically capture environments that provide optimal developmental conditions for the gifted such as "gifted environments" (Mirman, 2003), "smart contexts" (Barab & Plucker, 2002), or "talent hotspots" (Coyle, 2009).

This lack of an elaborated conceptualization of the wider environment in models of giftedness is surprising at first for two reasons. Firstly, in justifying their giftedness models, various authors have noted the importance of environmental factors extending beyond the immediate proximity of gifted learners such as culture, nations, and values (see Sternberg, 2007; Sternberg & Davidson, 2005; Shavinina, 2009). At least in part, these models are based on scientific paradigms that, in principle, allow for an elaborated analysis of the environment. Such paradigms include dynamic systemic (e.g., Jeltova & Grigorenko, 2005; Ziegler & Phillipson, 2012), developmental-relational (Dai & Chen, 2013), and sociocultural (Plucker & Barab, 2005; Reis, 2005; Valsiner & Rosa, 2007) approaches. However, just listing sources of influences that have their origin beyond the immediate environment of the gifted—sources such as cultural values or national wealth—tells us little about the nature and mechanisms of these more distal influences and how educators can harness such informational categories during day-to-day work with the gifted. Such wider environmental influences seem rather to be summarized within the conceptions of giftedness as a residual category that represents all the influences beyond the full and immediate control of the gifted educator.

Secondly, there is a rich literature that reviews gifted education on regional (e.g., Heller, Mönks, Sternberg, & Subotnik, 2000), national (e.g., Chandler, 2013; VanTassel-Baska, 2013), and cultural levels (e.g., Phillipson & McCann, 2007). Such reviews clearly go beyond the immediate environment of gifted education and thus appear to be based on the implicit assumption that factors beyond the immediate environment do indeed matter. However, the crucial question is whether these reviews just highlight differences between regional, national, or cultural practices in gifted education or also maintain, as a corollary, that these differences necessitate culturally distinctive approaches to gifted education. When reading reports on gifted education practices in various nations, for example, it becomes obvious that the Western paradigm dominates. Gifts and talents are predominantly perceived as fixed attributes of an individual that do not vary across contexts (Bryk & Raudenbush, 1992). This implicit assumption is a sure sign that the corollary has yet to be fully recognized and explored. Recognizing the—often overlooked—ubiquity of this Western paradigm of trait-focused giftedness is important for all conceptual reflections on giftedness and gifted education. In wrapping up a recent collection of essays (Dai & Kuo, 2015) about gifted education practices in Asian countries, for example, Vialle and Ziegler (2015) stressed the importance of recognizing and transcending this paradigm. They asserted: "Asian countries could do much better if they examine their own cultural strengths and give their gifted education its own identity rather than copying the tradi-

tional Western models" (p. 288). Thus, reflections on gifted education situated at regional, national, and cultural levels seem to be just adaptions to the local circumstances of the Western paradigm. They often lack an inner logic of their own. We will return to and elaborate on this criticism below.

Going Beyond the Immediate Environment

In the remainder of the chapter, we propose a macro-systemic perspective on gifted education designed to facilitate cross-national comparison studies of gifted education practices from a macro-systemic perspective. We will, first, consider instances of environmental influences that are situated well beyond the immediate environment of the gifted. Second, we will describe findings from earlier research and from our own recent work that illustrate the need to move beyond the immediate environment. Third, we will present five "exogenous lenses" and five "endogenous lenses" as an analytical framework for comparing available learning resources across countries. As the use of resources for talent development must be effectively coordinated, we will conclude by also suggesting six additional "systemic lenses" for systemic comparisons of gifted education across nations.

The Western Bias in Giftedness Conceptions

An international perspective on giftedness is based on the assumption that there exist cross-cultural and cross-national differences in conceptions, identification, and education approaches. However, whereas there are many publications about everyday conceptions of giftedness in different cultures (e.g., Sternberg, 2007), scientific conceptions of and research on giftedness generally reflect a Western and, in particular, Anglo-American bias. This bias was confirmed by a recent bibliometric examination of giftedness research publications by Stoeger, Balestrini, and Ziegler (2018) and described as being very strong.

The Lack of Cross-Cultural and Cross-National Research in Gifted Education

The bibliometric study reported by Stoeger et al. (2018) provided another key insight. Although the fields of cross-cultural psychology and education studies have laid theoretical and methodological groundwork (see King & McInerney, 2014, for a general introduction) that giftedness researchers are starting to use (see, for an overview, Campbell, Tirri, Ruohotie, & Walberg, 2004), only few cross-cultural studies exist that make comparisons of giftedness conceptions, gifted identification strategies, and gifted education provisions. Cross-cultural and cross-national studies of gifted education practices are extremely rare (Stoeger et al., 2018).

This insight is striking when one considers that the scant available research strongly suggests that practices of gifted educators vary substantially—and fundamentally—across social subsystems and strata, various subcultures, nations, and other macro-systemic levels. For example, Vialle (2017) found that in Australia gifted children being raised in Anglo-Australian and in Asian Australian families enjoy markedly different educational experiences. One important point seems to be that Asian Australian parents hold higher academic expectations for their children. Furthermore they "also go to great lengths, hiring tutors and setting learning pathways for their children from the beginning of school, to ensure that they are selected into the academic selective streams in late primary school and secondary school" (Vialle, 2013, p. 158). Recent work on the cultural underpinnings of long-standing academic achievement differences between East Asia and the USA also hints at the existence of far-reaching cultural variations in gifted education conceptions and practices (Balestrini & Stoeger, 2018) that have yet to be systematically investigated at a macro-cultural level.

Why the Cross-National Perspective Matters

Now that we have described the overall lack of cross-cultural and cross-national research on gifted education, we will briefly describe preliminary results of an ongoing cross-national study, as it offers an illustrative case in point for how the cross-national perspective for gifted education can help redress the long-overlooked Western bias in gifted education described above.

Despite the aforementioned recognition of the culturally specific nature of giftedness (Sternberg, 2007), little is known about whether or how *lay conceptions of giftedness* differ systematically between national cultures. *That* lay conceptions of giftedness may differ at the level of national cultures is likely. Resources-based approaches to giftedness suggest this. They have shown, for example, how thinking about learning and education correlates with achievement outcomes (Vladut, Vialle & Ziegler, 2015). Furthermore, East–West differences on thinking about achievement (views about learning, education, and effort) provide a basis for expectations about *how* lay giftedness conceptions might differ between cultures (e.g., Balestrini & Stöger, 2017; Balestrini & Stoeger, 2018; Holloway, 1988). As informal etiologies for observed or expected high achievements, lay giftedness conceptions probably reflect culturally specific reactions to high achievement (Balestrini & Stöger, 2017; Persson, 2014).

As a first-ever test of cultural variation in laypersons' giftedness conceptions in eight cultures, we used a 444-word wordlist (Pennebaker, Boyd, Jordan, & Blackburn, 2015) to compare work-word salience—as a proxy of the aforementioned achievement-related concern with effort—in a cross-cultural comparison of $N = 3{,}841$ short news-writing passages on giftedness from eight general-interest newspapers from around the world. A comparison of culture-specific means on the outcome variable (work-word salience as a proxy of concern with effort) and a series of post-hoc tests indicated significant differences in work-word salience means between the group members within our comparison, which we summarize in Fig. 2.1.

The differing work-word salience values in the giftedness-related passages indicate culturally variable levels of concern with effort within the context of giftedness-related discourse. We highlight just one such example of a significant difference between two cultures on this outcome variable to better illustrate how the assessment confirmed our hypothesis. The highest mean score for work-word salience was in the US sample ($M = 1.15$, $SD = 1.18$); the lowest mean score for work-word salience was in the Thai sample ($M = 0.75$, $SD = 0.83$). In the USA, the prevalence of work words in the giftedness sample ($M = 4.59\%$, $SD = 4.71$) was significantly *higher*

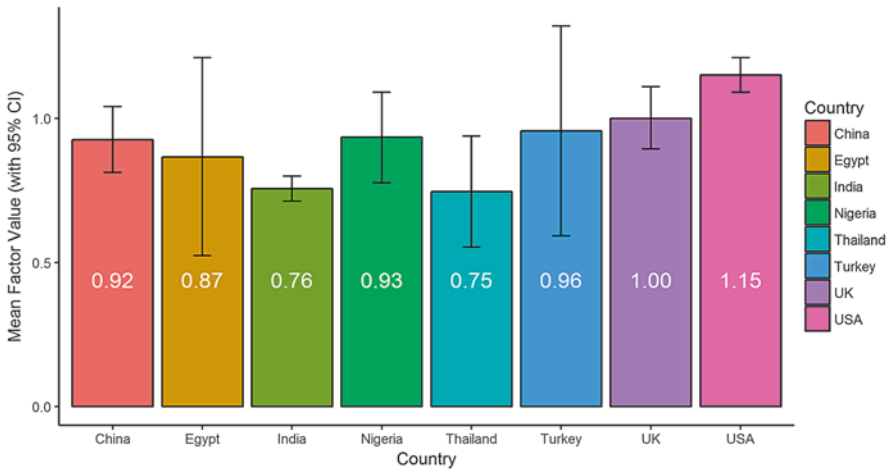

Fig. 2.1 Domain-specific work-word salience in gifted versus domain-general conditions

than the prevalence of work words in the same US news source overall. Hence, the US work-word salience score of 1.15 is greater than 1, reflecting the fact that work-word usage increases significantly over the newspaper-specific domain-general baseline usage prevalence when writing turns on matters of giftedness. In Thailand, the situation was reversed. The prevalence of work words in the giftedness samples was significantly *lower* than the work-word prevalence in the Thai newspaper overall. In Thailand, gifted discourse correlated with a significant decrease in work-word usage. For the extremely important domain of work, we see that giftedness discourse in Thailand and the USA is characterized by very different amounts of concern with the association between giftedness and the world of work.

The sort of macro-level difference in everyday thinking about giftedness in different cultures illustrated by our word-usage study belies the profound Western bias of gifted education research documented by our bibliometric study described above. It is difficult to discern all the causes of the aforementioned Western biases in models of gifted education. We do, however, see one obvious reason why overcoming this bias in cross-national gifted education research and practice proves difficult. As most existing conceptions of giftedness do not encompass an elaborate means of capturing environmental influences beyond the immediate environment of the gifted individual, the conceptions do not allow macro-systemic differences (e.g., cultural or national differences) to feed back into gifted education practices. Rather, adaptations of the gifted education practices to local circumstances will tend to be informal and haphazard. We, therefore, propose a novel approach that systematically integrates a macro-systemic perspective into a model of giftedness.

Ten Lenses for Cross-National Comparisons of Learning Resources for Gifted Education Systems

We propose that cross-national comparisons of gifted education systems always be anchored by a systematic consideration of learning resources. Country-specific learning resources should be analyzed at the macro-level and the individual level. Both analyses should consider which resources are available and how well the various resources are being systematically interconnected and coordinated to facilitate efficacious gifted education and talent development.

Learning Resources

The actiotope model of giftedness (Ziegler, 2005) offers a framework for the formulation of submodels that has been specifically designed for the practical purposes of gifted education. One such submodel is the learning resources approach (see Alghawi & Ziegler, in press; Ziegler, Chandler, Vialle, & Stoeger, 2017).

By definition, a system uses resources to maintain its stability and to produce certain outputs. For example, the school system of a country uses—among many other resources—financial resources to acquire educational materials, material entities such as school buildings and desks, and social resources such as teachers or headmasters. The main output of such a system is, roughly speaking, educated students.

For the pursuit of specific learning goals (e.g., academic achievement, chess skills, or instrumental music skills), there exists an infinite variety of possible resources a complex dynamic system might use. The actiotope model of giftedness provides a window into such complex dynamic systems by way of a convenient and exhaustive typology of resources. The model distinguishes endogenous learning resources (within the gifted individual) and exogenous learning resources (without, in the individual's environment at all possible systemic levels).

Ten Lenses to Analyze Learning Resources Across Countries

Tables 2.1 and 2.2 provide definitions for ten lenses through which we analyze the learning resources within a country (for details, see Ziegler et al., 2017). Each lens focuses a particular type of

Table 2.1 The five exogenous lenses for evaluating learning resources across countries

Lens type	Definition
Economic	Any assets that can be invested in the initiation and maintenance of educational and learning processes
Cultural	All manner of value systems, thinking patterns, outlooks, and models that can facilitate—or hinder—the attainment of learning and educational goals
Social	All persons and social institutions that can directly or indirectly contribute to the success of learning and educational processes
Infrastructural	Materially implemented possibilities for action that allow learning and education to take place
Didactic	The assembled know-how involved in the design and improvement of educational and learning processes

Table 2.2 The five endogenous lenses for evaluating individuals' personal learning resources across countries

Lens type	Definition
Organismic	The physiological and constitutional resources of a person
Telic	All the anticipated goal states that offer a person possibilities for satisfying needs
Actional	All the actions of which a person is capable (the action repertoire)
Episodic	The simultaneously goal- and situation-relevant actions that are accessible to a person
Attentional	The quantitative and qualitative attentional resources that a person can apply to learning

resource or *capital*. The latter metaphor, which we will use frequently, is helpful, as the term *capital* denotes a resources construct that can be used more flexibly than the term *resource*. *Capital* includes resources that can be created and transformed (e.g., financial resources). The five exogenous and five endogenous lenses are conceptually analogous to one another. Each pair of lenses reflects the same systemic logic.

The *economic and organismic lenses* reflect analogous types of capital that form the undirected material basis of the exogenous and endogenous systems respectively. The economic lens focuses the overall macro-level; the organismic lens focuses the individual as a whole. Both types of capital are undirected in the sense that they each stand for a sort of proto-capital (i.e., a basic form of capital awaiting transformation). Money, for example, is a form of economic capital that can be spent for many purposes. When money is invested to facilitate individual development and learning, it becomes *educational capital*. Similarly, a healthy body is a valuable and often necessary resource for many activities. When available physiological resources are effectively mobilized to the end of learning, then the individual's healthy body qualifies as organismic learning capital.

The remaining four types of lens reflect types of capital based on various state spaces.[1] We describe each remaining type of lens in turn.

- *Infrastructural educational capital* (the exogenous lens) and *actional learning capital* (the endogenous lens) describe the set of all conceivable state spaces of actions. Infrastructural educational capital refers to the actions occurring within and facilitated by an environmental system or setting such as a resource room or a library. Actional learning capital refers to the actions occurring within and facilitated by the individual.
- *Cultural educational capital* (the exogenous lens) and *telic learning capital* (the endogenous lens) denote desired and undesired states of a system with regard to learning. These states can be further divided into attractors and repellers. Attractors are states towards which a system tends to evolve; repellers are states that a system tries to avoid.
- *Social educational capital* (the exogenous lens) and *attentional learning capital* (the endogenous lens) refer to the activation of resources for development and learning. The exogenous resources tasked with regulating gifted individuals' development and learning are usually social instances (e.g., parents, teachers, coaches, religious leaders, role models). A very

[1] In dynamic systems theory, state spaces are the set of values that a process can take.

distal example of social educational capital is the politicians who determine which proportion of a state's budget is to be spent on an educational system. In a similar vein, attentional learning capital denotes the internal resources an individual employs to make use of other resources for learning.

- *Didactic educational capital* (the exogenous lens) and *episodic learning capital* (the endogenous lens) refer to effective regulation of education and learning activities, either via a system in the environment of the individual or within the individual.

In successful education and learning, the inner state of the system, its attractors and repellers, as well as its environment coalesce propitiously. For example, when a teacher recommends a certain learning strategy to a student and the recommendation helps the student to better understand new content, the teacher has succeeded in selecting an appropriate action from her or his own action repertoire as a teacher and from the action repertoire of the student. The teacher's recommendation helped the teacher and the student to achieve a goal they were working on together.

Six Lenses for Cross-National Comparisons of the Systemic Aspects of Gifted Education Systems

In this section, we will introduce an additional set of analytical lenses for use in designing and implementing cross-national assessments of gifted education systems. Whereas the 10 lenses described above are intended for the analysis of the endogenous and exogenous learning resources themselves, the six lenses we propose here are designed to guide the overall analytical process that, we imagine, will be at the heart of any systematic cross-national assessment of gifted education programs and offerings. Before we describe these lenses, we first provide an overview of the systems-theory nomenclature we employ in doing so, which is based both on Bronfenbrenner (1979) and work done by the first and third authors of chapter (Ziegler & Stoeger, 2017).

Systems and Sets

There is no clear-cut definition of macro-systems. Indeed, the term *macro-system* is not even a basic concept of systems theory. *Elements* are the smallest, most basic building blocks in a system (Ziegler & Stoeger, 2017). Yet when describing and analyzing a system, the resolution level is not fixed. The observer of a system may choose not to describe a system at the element level. Reality can, of course, be analyzed on many levels. Examples of resolution levels abound. A gifted child is a member of a family, which is in turn a member of a local neighborhood. The local neighborhood is part of a quarter or district, which is itself part of a municipality. The municipality is likely aggregated into a county or other such region. In many countries, federal states or provinces then follow. Thereafter frequently a nation. Nations themselves are, in many cases, then aggregated into even larger systems such as the European Union or the CONCACAF (the Confederation of North, Central American, and Caribbean Association Football). Elements are organized in systems that are, themselves, subsystems of higher-order systems. The system in which a subsystem is entangled is a supra-system. From this standpoint, a gifted child is—at the same time—both a subsystem to many supra-systems (e.g., a family, a school, an educational system, a nation) *and* herself or himself a supra-system to subsystems such as a brain, which is itself a supra-system to its limbic system, which is a supra-system to the hippocampus. No inherent criterion of systems theory can tell us at what hierarchical level the macro-system would begin.

In order to establish at least some terminological clarity, we want to briefly introduce a subset of well-established terms suggested by Bronfenbrenner (1979) that are useful to our current theoretical end. Bronfenbrenner (1979) distinguishes different levels of subsystems within a

person–environment system. A *microsystem* consists of the individual and her or his immediate settings (e.g., family, kindergarten). At the next systemic level, a *mesosystem* contains all connections between the microsystems to which an individual belongs. For example, the mesosystem of a gifted student might contain the family, the parents' workplaces, the school, etc. Moreover, many systems affect the individual of which she or he is not a part (e.g., the parents' workplaces). Bronfenbrenner calls such systems *exo-systems*. The overarching system to these systems is the *macro-system*, which comprises the totality of all social, political, legal, economic, and cultural conditions that influence the development of a person.

There are some slight inconsistencies in Bronfenbrenner's (1979) use of the basic terms from the point of view of systems theory. Sometimes he uses the term *system*, but it seems as if he is sometimes only referring to persons in a *setting*, which systems theory defines as the time, place, and surrounding in which persons act. In fact, not all collections of elements or subsystems form systems. According to Ziegler and Stoeger (2017), "a system consists of interacting elements or components that make use of resources to maintain a certain level of internal stability and function as a whole in order to produce certain behaviors" (p. 2). In this sense, a gifted child's Bronfenbrennerian mesosystem would not qualify as a system in the systems-theory sense set out by Ziegler and Stoeger (2017).

In the Ziegler–Stoegerian systems-theory sense, simple collections of non-interacting elements that do not produce stable behavioral patterns do not qualify as a system. For example, when a child draws her very first picture in kindergarten, this accomplishment might remain a singular event for a long time. Her peers and caregivers may not even notice her drawing let alone praise her for it. The child's attention might immediately move on to something else. Thus, in this drawing-domain example, no components that are interacting to produce stable behavioral patterns and outcomes can be isolated in the situation. Such isolated processes and pure collections of elements or subsystems are usually termed a *set*.

Sets, however, can develop into systems, and that is precisely what happens when an individual lives up to her or his talents. Hitherto unconnected elements start to become connected and ever more coordinated. They coalesce to form what might be called a proto-system. At this point, the proto-system is still not stable enough to sustain itself, but it repeatedly produces certain outputs. Returning to our previous example, at some point in the child's life, someone might notice her drawing talent and initiate systematic efforts to facilitate its development. If these efforts lead to performance gains, further measures might be taken until a substantial part of her life is centered on her talent development. Finally, her talent development may eventually lead her to a phase of professional drawing expertise in which her life and livelihood are centered on her artwork, with frequent, ongoing expertise-related interactions with persons including agents, sponsors, lawyers, fans, and pupils.

Analogously, one can imagine a country in which gifted education is neither coordinated nor integrated at the national level. In such a case, various sub-systems such as dedicated families might play a much greater role in supporting the talent development of children. Thus, a Ziegler–Stoegerian macro-systemic analysis of a given country might lead to the conclusion that while that country undoubtedly possesses an education system—the national school system consistently generates systematically educated people—the same country does not show evidence of a system for talent development. Therefore, in the systems-theory sense set out by Ziegler and Stoeger (2017), any uncoordinated, vacillating gifted education efforts observed in that country would best be described as comprising a set or a proto-system. Figure 2.2 summarizes and visualizes the relationship between sets, proto-systems, and systems in the sense set out by Ziegler and Stoeger (2017).

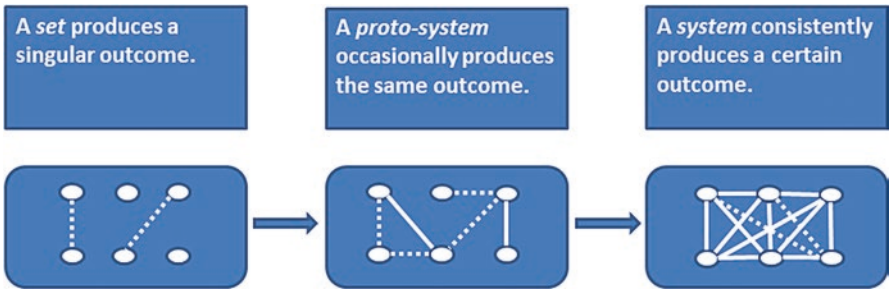

Fig. 2.2 Systemic development from a set to a system

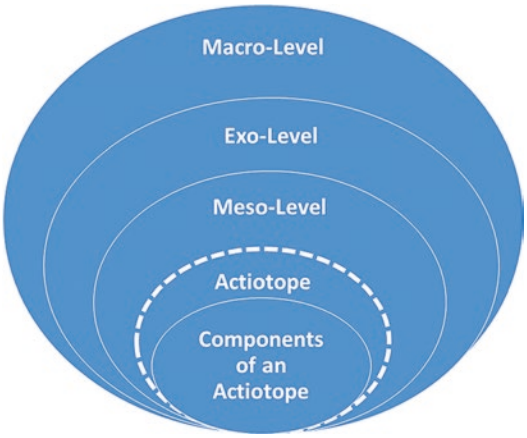

Fig. 2.3 Proposed systemic levels

Proposed Systemic Levels for Cross-National Comparisons in Gifted Education

A systemic analysis of the gifted education system of a nation can be conducted on various hierarchical levels. We will now briefly define these levels, using an adaptation of Bronfenbrenner's and our own terminology. Figure 2.3 sums up our proposed system of systemic nomenclature.

Actiotopes consisting of a person and her or his environment are created and recreated with every action. These actions can (1) take place in *settings* varying from untouched nature to composite anthropogenic spatiotemporal settings comprised of manifold interconnected systems coordinated to provide optimal conditions to fulfill highly specialized functions. For the latter case, one might think of a special compartment in a high-speed long-distance train intended for commuters who wish to work without being disturbed (with special no-mobile-telephone-use signs) or a classroom with noise-reduction wall paneling designed to facilitate comfortable verbal communication during group-learning phases. Furthermore, the actions can (2) serve the functional logic of supra-systems. For example, as a representative of an education system, a teacher will adhere to the functional logic of that system. Her or his goal will be to teach the students according to the applicable curriculum. This goal will take precedence in this situation.

By using the Ziegler–Stoegerian system concept of an actiotope instead of a Bronfenbrennerian micro-system, we can account for a case in which the interaction of an individual with certain environments does not necessarily form a system with all of those environments. Similarly, with regard to Bronfenbrenner's meso-system, one has to consider whether the sum of the immediate environments around an individual constitutes a system. Indeed, in many cases the systems in which an individual is acting in a given moment are not at all well integrated. Such systems are frequently not consistently working together to produce a certain outcome. The environments with which an individual interacts are often heterogeneous and only peripherally related.

However, as the environments in which an individual acts extend beyond the individual and as the individual's actiotope describes only the small part of the environment with which the

individual is interacting, we think it useful to expand our terminology to include the Bronfenbrennerian *meso-level*. The term reflects the fact that the environment around an individual might not necessarily form a system. The meso-level encompasses much more than just the enacted environment. In this respect, meso-level sets and systems transcend the actiotope. Hence, meso-level processes often proceed when an individual is not present. For instance, even if a student stays home sick, class will still take place. For this same reason, meso-level systems and sets are connected to and interact with many sets and systems of which the gifted individual is not a member. Following Bronfenbrenner (1979), this sphere can be termed the *exo-level*. The choice of the term reflects again that the components present at this level need not constitute a system. Moving out further still, a *macro-level* can be defined that comprises all systems and sets of the meso-level and the exo-level. Thus, via the meso-level, the gifted individual is an element in the systems and sets of the macro-level.

Systems and sets on the macro-level can take on various forms. Numerous macro-systems permeate our everyday lives (e.g., a province, a healthcare system, or a nation). From the perspective of systems theory, none of these terms can be precisely defined. Rather, they serve heuristic purposes. For example, speaking of "taking an international perspective" masks the huge diversities that exist both within and between nations. Nations themselves vary dramatically in their makeup and size, and yet the "international perspective" notion makes no distinction between Lilliputian nations with fewer than one million citizens and only one or a few languages (e.g., Luxembourg) and gargantuan, polyglot nations like China and India with more than one billion citizens each and more than 200 different languages.

Six Systemic Lenses for Cross-National Comparisons in Gifted Education

For those interested in making cross-national comparisons of gifted education systems, ascertaining the availability of endogenous and exogenous resources on all systemic levels is not enough. Making inventories of resources is only a first analytical step. Indeed, resources only produce certain outcomes—in our case successful gifted education—when they are processed. Systemic analyses of complex systems are thus inherently intractable. To the end of facilitating more informed, systematic comparisons of gifted education efforts at the level of nations or of other macro-level political, cultural, or social units of aggregation, we thus suggest the review of six principles as a core of such an analysis:

1. *Law of the minimum*: The successful production of the desired outcome of a system is not determined by the total amount of resources available, but rather by the amount of the scarcest variable. This is the law of the minimum originally introduced by Ludwig von Liebig in 1840 (see Salisbury, 1992). Thus, a systemic analysis must start by carefully quantifying the available amount of each endogenous and exogenous resource to determine whether any resource insufficiency might compromise the net effectiveness of a national gifted education system.
2. *Continuity principle*: Gifted education is a dynamic process that unfolds over long periods of time. Thus, its focus cannot meaningfully be on one-off educational episodes such as a summer program or an enrichment program. Rather, it needs to concern itself with continuous learning pathways that describe complete developmental trajectories towards domain-specific high achievements and excellence. For example, at the moment when one learning goal has been attained, the trajectory towards the next must already have been set. Otherwise the learning process would be retarded or could wholly fail. The continuity principle states that at every point in time along a learning pathway, sufficient exogenous and endogenous learning resources must be available and readily accessible. If a national gifted education system provides gifted education services piecemeal, if bureaucratic or other regulatory exigencies prevent a

highly responsive, needs-based provision of gifted education services, chances are, the system will fail to uphold the continuity principle. Thus, a crucial criterion for cross-national comparisons is whether the gifted education systems or measures under review afford gifted learners the continuous provisions they need, when they need them.

3. *Developmental level of the gifted education system*: The question here is whether the educational provisions in a society form a system—according to our definition above—or if the putative gifted education system is better characterized as a set of more or less autonomously coexisting activities. The examination of this principle needs to consider three related questions: (1) whether all the entities and processes dedicated to gifted education interact as a whole to produce (2) certain outcomes (e.g., learning outcomes) and whether (3) the gifted education system is able to meaningfully regulate phases of homeostasis and homeorhesis[2] within the actiotopes of the gifted (see Ziegler & Stoeger, 2017). If, for example, kindergartens, schools, and universities within one educational framework provide uncoordinated gifted education measures that students merely stumble across and take part in occasionally as they work their way through primary, secondary, and tertiary education, then such activities are better described as constituting a set, rather than a proto-system or a system (see Fig. 2.2).
4. *Specialized gifted education support systems*: Many societies have robust subsystems specialized on providing specific forms of gifted education and talent-development support (e.g., specialized schools for the gifted with domain-specific foci in areas such as academics, music, or sports). Countries that offer a fine-meshed network of specialized gifted education provisions for a multitude of domains provide much better opportunities for effective matching of endogenous and exogenous learning resources that facilitates successful talent development. The strength of such a network depends not only on the exogenous resources it can provide. Effective networks of specialized gifted education systems must, of course, also fulfill the aforementioned continuity principle. As it is difficult to guarantee the continuous supply of resources for specialized talent development, educators of the gifted should pay considerable attention to the creation of agile gifted education support systems that function as resource centers.
5. *Control systems:* A critical part of the evaluation of gifted education at the country level is the assessment of control systems. These are specialized subsystems that decide on, initiate, and monitor the use of resources for and the outcomes of talent development. To this end, they make use of various positive and negative feedback loops. The installation of control systems is based on the insight that the successful and efficient use of talent-development resources must always be carefully regulated and constantly self-improving (Ziegler & Stoeger, 2004). In this case, the control system initiates various feedback loops. At the level of general education systems, international standardized tests have gradually taken on the function of a nation-level control system over the past 50 years (e.g., Husen, 1967). Yet to the best of our knowledge, no country—and certainly no consortium of countries—has so far established control systems with a clear set of rules about how to initiate feedback cycles for its gifted education systems. Proto-systems do exist, as can be observed in national training strategies for various sports disciplines.
6. *Externalities management:* With thoughtful, theoretically rigorous planning and implementation, gifted education systems can hopefully improve their track records of reaching the educational goals they have set for themselves.

[2]Homeostasis and homeorhesis are technical terms from dynamic systems theory (Ziegler & Stoeger, 2017). Homeostasis denotes the process by which a system returns to a particular state (e.g., an exhausted student takes a rest). Homeorhesis, on the contrary, is the process by which a dynamic system returns to a trajectory (i.e., a path with a slope; e.g., a gifted student who had lost motivation is resuming learning activities in order to develop skills).

However, every action always has unintended consequences. Among the unintended consequences, a *positive externality* is defined as an action that ultimately leads to the accumulation of learning resources in the system. Similarly, a *negative externality* occurs when an action ultimately leads to the loss of learning resources within a system. One simple way of creating positive externalities and preventing negative externalities is gifted advocacy (Gilman, 2008). For example, publicizing the successes of a gifted education system may convince citizens to vote for a candidate who is prepared to invest more in gifted education (e.g., by increasing the number of gifted education teachers or enhancing the infrastructure for gifted learning activities).

Summary and Conclusions

We open our chapter with the observation that there is a strong trend in gifted identification to move beyond the individual and even the individual's immediate environment. It might be reasonably assumed that the interest in the role of macrostructures has been spurred by the rise of what could be termed an *accomplishment orientation*, that is, a focus of researchers, policymakers, teachers, parents, and other stakeholders on the successful outcomes—the extraordinary achievements—of gifted development. This new interest is probably best reflected in the scientific maturation and remarkable popularity of expertise and innovation research (Ericsson, Charness, Feltovich, & Hoffman, 2006; Gladwell, 2008; Shavinina, 2009). Instead of asking "Will person X make extraordinary achievements?" or "Will person Y be able to innovate?" more nuanced questions are being posed, such as: "What are the chances that a student will develop her talents better at school A than at school B?" and "What are the chances that at research institute X a researcher will win the Nobel Prize in field Y?" Such contextualized questions reflect an awareness of the fact that talent development is always the result of systemic interactions of exogenous and endogenous learning resources. To answer such questions, a shift in focus towards systemic interactions and, in particular, to include the far-reaching macro-structures that permeate most societies is necessary.

To argue our case, we then considered findings by other researchers and ourselves that, we argue, clearly illustrate the necessity of a shift in formal analytical focus towards macro-systemic interactions. A modern gifted education needs not only to overcome the aforementioned Western bias, it also needs to learn that diversity on a macro-structural level—like the international and cultural diversity itself—is not just something to which a standard model of gifted education can be adapted. Rather, each country and culture needs its own gifted education. Such gifted education systems have their own national or cultural identities that reflect the exogenous learning resources in a given country or culture, the endogenous learning resources within the individuals in the country or culture, and how both types of resource are systemically integrated. Tables 2.1 and 2.2 and our six systemic lenses through which macro-level gifted education offerings should be compared provide readers with a meta-theoretical toolbox of sorts that should be employed, we argue, when devising and implementing a cross-national comparison study of gifted education.

We have pointed out that each country has to find its own way in gifted education and to develop its own identity for its gifted education system. The constellation of exogenous and endogenous resources in each country is unique. Each polity needs to develop an efficient, self-sustaining system that fulfills the six systemic criteria postulated above. Despite the uniqueness of such solutions, cross-cultural comparisons will nevertheless be extremely useful. Although such studies will certainly not reveal a "best way or recipe" for doing gifted education, cross-national comparisons will nevertheless prove extremely instructive and useful. We are quite confident of this, because the structural equivalence (i.e., the degree of resemblance; for details see Ziegler & Vialle, 2017) of educational goals,

learning resources, and problem constellations helps researchers and policymakers to identify the most relevant experiences in one country from which citizens of another country can learn. Thus, we need more, not less comparative research on an international level in order to make progress in gifted education. Such research must, however, be based on a theoretical approach that avoids the pitfall of comparing apples with oranges.

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3 Theories and Conceptions of Giftedness

Robert J. Sternberg and Scott Barry Kaufman

Abstract

This chapter discusses theories and conceptions of giftedness. First, it presents some of the history of these theories and conceptions—from domain-general to domain-specific to systems to developmental models. Then it reviews programs based on various conceptions of giftedness, including the theory of successful intelligence, the third-ring conception, Study of Mathematically Precocious Youth (SMPY), and German models. Then it discusses the future of the field and finally it draws conclusions.

Johnny, a 9-year-old elementary school student, has an IQ of 140, which would qualify him as "gifted" by virtually any IQ-based definition of giftedness anyone might use. Johnny has few friends, in large part because he has very poor social skills. Johnny has no hobbies to speak of, and is unengaged in significant extracurricular activities outside of school. And despite his IQ, Johnny is a good, but not great, student.

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Davy is also 9 and is in the same school as Johnny. He has an IQ of 120, which would quality him as "gifted" by some, but not other IQ-based definitions of giftedness. Davy is very active in sports and is the best soccer player of any age in his school. He also is a highly talented trombonist, and is first trombone in the elementary-school orchestra. His teacher believes he has the potential for a career in musical performance, should he wish to follow that path. Davy is very popular and is one of the top three academic performers in his class.

Who is gifted? Johnny? Davy? Both? Or neither? In answering this question, four things must be kept in mind.

First, "giftedness" is a label—nothing more. We are frequently asked whether such-and-such or so-and-so child is gifted. The answer depends on the criteria one sets. But there is no one absolute or "correct" set of criteria. Criteria for such labeling are a matter of opinion, nothing more, and there are many disagreements as to how the label should be applied.

Second, the label can be applied in either a more general or a more specific way. The more general way implies that giftedness is relatively general across many domains. On this view, someone who is gifted is gifted very broadly. The more specific way implies that giftedness is something that is potentially limited to one or several narrow domains—for example, verbal skills; or within the verbal domain, writing skills; or within

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the writing domain, fiction-writing skills. Indeed, relatively few successful fiction writers are also successful nonfiction writers, and vice versa.

Third, conceptions of giftedness can and do change over time and place. At times in the past, a child's ability rapidly to learn classical Greek and Latin might be viewed as an important sign of giftedness. Today, such an ability generally would be relatively less valued. Similarly, the skills that lead a child to be labeled as gifted might be different in a hunting and gathering village in rural Tanzania than in urban Los Angeles.

Fourth, conceptions of giftedness can be based on either explicit theories (e.g., Sternberg, 1981, 1997a, 1997b, 2003) or implicit theories (e.g., Sternberg, 1993) of giftedness (see also Sternberg, 1990; Sternberg, Jarvin, & Grigorenko, 2011, for the different models that can underlie conceptions of abilities, including superior abilities). An explicit theory is one proposed by a scientist or educator who has studied giftedness and has arrived at a conception of giftedness that has been subject to some kind of empirical test. An implicit theory is simply a layperson's conception of a phenomenon. It has no explicit scientific basis. It might be looked at as a "pragmatic" conception rather than as one based on rigorous research.

As we review conceptions of giftedness, keep in mind the four constraints above. The chapter does not provide final "answers," because there are no such answers. Rather, each reader will have to decide for himself or herself which conception or conceptions he or she finds to be compelling.

First Wave: Domain-General Models

Many of the earliest giftedness researchers investigated the scientific basis of giftedness from a domain-general perspective, using the words "gifted," "genius," and "talented" almost interchangeably. It is completely reasonable to begin a scientific investigation of a topic in this manner, and the work of these "first wave" pioneers laid an important foundation for future research on the nature of giftedness and talent.

Francis Galton's book *Hereditary Genius* (1869) was one of the first public outlets to present a theory of genius. Galton conceptualized genius as "an ability that was exceptionally high and at the same time inborn" (Galton, 1892, p. viii). He garnered support for his theory by analyzing the family lineage of distinguished European men. He found that genius ran in families, and concluded from this that genius must be genetically inherited, in much the same way as physical attractiveness. Galton's *estimation* (as opposed to measurement) of genius was ostensibly subjective, using indices such as enduring reputation. Galton's technique had limited effectiveness for an understanding of giftedness in young people (in part because he focused on genius-level individuals), but he nonetheless set the gears in motion for the scientific study of giftedness.

At the turn of the twentieth century, English psychologist Charles Spearman (1904) noticed that a wide variety of cognitive tests tend to positively correlate with each other. Using his newly developed statistical technique of factor analysis, he determined that there is a significant amount of common variance across all of the tests, with some variance specific to each test. He called the pervasive ability *g*, or general intelligence, and each of the specific abilities *s*. Spearman viewed *g* as general and innate (i.e., as having a strong physical substrate), much in line with Galton's view on the hereditary basis of genius. He later proposed that the general factor was a result of "mental energy" (Spearman, 1927).

Around the same time Spearman discovered the *g* factor, Alfred Binet and Theodore Simon (1916) were developing a mental scale to identify students in need of alternative education. The scale comprised a variety of tasks that were thought to be representative of a typical child's ability at various ages (Siegler, 1992). Binet and Simon's scale was one of the first tests to include an assessment of higher level cognitive skills. Galton thought the best way to measure intelligence was through sensory-discrimination tasks, and indeed many of the tests that Spearman first put into his factor analysis were tests that could hardly be considered higher-level cognition.

Such tests included keenness of sight and hearing, color sense, breathing power, strength of pull and of squeeze, force of blow, span of arms, height, and weight (Galton, 1908).

Lewis Terman adapted Binet's scale and created the Stanford-Binet Intelligence Scale, one of the first intelligence tests used to identify gifted schoolchildren (Terman, 1916). Even though Terman adapted Binet's test, he also adapted Galton's theory of the nature of genius, and viewed giftedness as a single entity, equating giftedness with a high IQ. He created a classification scheme in the schools (which is sometimes still used today) in which a student with an IQ score above 135 is described as "moderately gifted" (Terman, 1925), above 150 as "exceptionally gifted," and above 180 as "severely and/or profoundly gifted" (Webb, Meckstroth, & Tolan, 1982). As for how these tests would be used, he suggested that:

> Teachers should be better trained in detecting the signs of superior ability. Every child who consistently gets high marks in his school work with apparent ease should be given a mental examination, and if his intelligence level warrants it he should either be given extra promotions, or placed in a special class for superior children where faster progress can be made. The latter is the better plan, because it obviates the necessity of skipping grades; it permits rapid but continuous progress. (Terman, 1916, p. 14)

The nature of general intelligence is still a highly researched area (Detterman, 2002; Jensen, 1998; Kyllonen, 2002; Ortiz, 2015; Willis, Dumont, & Kaufman, 2011). In addition, a few modern giftedness researchers do still equate general intelligence with giftedness (e.g., Gallagher & Courtright, 1986), and many identification procedures in the USA rely heavily on full-scale IQ scores (e.g., McClain & Pfeiffer, 2012; see *Implications for Education* section).

Second Wave: Domain-Specific Models

Not everyone was content with equating high general intelligence with giftedness. One of the earliest researchers to emphasize the variety of ways an individual can be gifted was Louis Thurstone (1938). Using a different method of factor analysis than Spearman, he identified seven primary mental abilities that he claimed were statistically independent of each other: (1) Verbal comprehension (involved in the ability to understand verbal material), (2) Verbal fluency (involved in the ability to rapidly generate a large number of words or concepts with specific characteristics), (3) Number (involved in rapid arithmetic computation), (4) Perceptual speed (involved in rapid recognition of symbols), (5) Inductive reasoning (involved in reasoning from the specific to the general), (6) Spatial visualization (involved in mentally visualizing and rotating objects), and (7) Memory (involved in remembering information).

The debate between Spearman and Thurstone could not be reconciled on purely theoretical grounds, but accumulating evidence supported hierarchical factor models of intelligence, with general ability at the very top, more nearly general intellectual abilities near the top, and various more specific forms of intelligence further down in the hierarchy. Two hierarchical theories that have had considerable influence on modern intelligence tests are the theory of fluid and crystallized general intelligences (Horn & Cattell, 1966) and Carroll's (1993) three-stratum theory of cognitive abilities (see also Ortiz, 2015).

In early versions of their model, Horn and Cattell (1966) proposed that general intelligence consists of two major parts: fluid (*g-f*) and crystallized intelligence (*g-c*). Intelligence is thought to be dependent on the efficient functioning of the central nervous system, rather than on prior experience and cultural context. Crystallized intelligence, on the other hand, is thought to be more dependent on experience and cultural context.

The more recent model and the one that has arguably gained the widest acceptance in the psychometric community is Carroll's (1993) three-stratum theory. Carroll proposed this model after an extensive analysis of more than 460 data sets from the psychometric literature. In Carroll's model, Stratum I reflects highly specialized

skills, some of which represent Thurstone's primary mental abilities. Stratum II reflects somewhat specialized abilities that occur in broad domains of intelligent behavior. They include (in order of decreasing relatedness to *g*): fluid intelligence, crystallized intelligence, general memory and learning, broad visual perception, broad auditory perception, broad retrieval ability, broad cognitive speediness, and processing speed. Stratum III has only one ability, the *g* factor, which allegedly underlies all aspects of intellectual activity.

Recently, Carroll's model and the Horn–Cattell model have been synthesized into the Cattell–Horn–Carroll (CHC) theory (Flanagan & Harrison, 2012). Even though the CHC model still incorporates a *g* factor, its main emphasis is on the measurement of middle-stratum factors. The CHC theory has been influential in the development of a variety of IQ tests, including the fifth edition of the Stanford-Binet (Roid & Barram, 2004), the second edition of the Kaufman Assessment Battery for Children (KABC-II; Kaufman, Lichtenberger, Fletcher-Janzen, & Kaufman, 2005), and the fourth edition of the Woodcock-Johnson Cognitive Abilities Assessment (WJ IV; see Mather & Wendling, 2014).

Hierarchical psychometric definitions of intelligence have deepened our understanding of a statistically derived structure of human abilities. Such theories are not theories of giftedness per se, but have played an important role in our understanding of giftedness by suggesting that beneath *g,* there are hierarchically related abilities that contribute to intellectual gifts.

This idea was expanded upon and brought to public attention when Howard Gardner (1983) published his first edition of *Frames of Mind*. This and subsequent works (Davis, Christodoulou, Seider, & Gardner, 2011; Gardner, 1983, 1993, 1999) described the Multiple Intelligences model of intellectual ability, which stresses the need for educators and psychologists to broaden their definitions of human intelligence. In this model, multiple intelligences are not static abilities hierarchically nested under a general factor, but rather are each an independent cognitive system in its own right.

Gardner defined intelligence as "an ability or set of abilities that permit an individual to solve problems or fashion products that are of consequence in a particular cultural setting" (Ramos-Ford & Gardner, 1997). Instead of solely relying on factor analysis, Gardner based his conclusions on a selective analysis of the research literature using eight criteria, namely, (1) potential isolation by brain damage, (2) the existence of idiot savants, prodigies, and other exceptional individuals, (3) an identifiable core operation or set of operations, (4) a distinctive development history, (5) an evolutionary history and evolutionary plausibility, (6) support from experimental psychological tasks, (7) support from psychometric findings, and (8) susceptibility to encoding in a symbol system, and concluded that there were eight separate intelligences. The eight intelligences he has proposed are linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist.

Although Gardner's theory has had an important influence in the broadening of educators' views of intelligence, various criticisms have been proposed. First, there currently exists no published empirical test of the theory as a whole. Second, the intelligences that Gardner proposes are based on a somewhat selective review of the literature that largely supports his theory. Also, the literature he used is distinctly different from the conventional psychometric literature, much of which has been used to support the theory of general intelligence (e.g., Jensen, 1998). Third, even though assessments exist to test the various intelligences (e.g., Gardner, Feldman, & Krechevsky, 1998), they have not been proven to be of adequate psychometric validity. The ones that have been tested (with the exception of kinesthetic intelligence) all show a strong influence of the *g* factor (Visser, Ashton, & Vernon, 2006). There is some evidence to suggest, however, that they are of acceptable reliability (Plucker, Callahan, & Tomchin, 1996). Without demonstrably valid tests, however, it is difficult to evaluate the success of interventions.

Gardner is not the only researcher to have considered abilities in a more domain-specific way.

Julian Stanley's experiences with precocious youth also led him to develop a domain-specific conception of giftedness. In fact, Stanley chose to avoid the word "gifted" in favor of "precocious" (Brody & Stanley, 2005), to emphasize that giftedness is not domain general, but instead is precocity demonstrated in a specific domain.

Stanley established the Study of Mathematically Precocious Youth (SMPY) at Johns Hopkins University in 1971 with the purpose of identifying youths with precocious specific abilities, especially in mathematics, and of supplying them with the educational resources they need to achieve their full potential. So far, SMPY has primarily focused on the identification and nurturance of students who exhibit exceptional verbal, spatial, mechanical, and mathematical abilities (McGin, 1976; Lubinski, Benbow, & Kell, 2014; Stanley, 1994). This has taken the form of challenging summer courses and distance learning (see *Linking Theory to Practice* section).

Third Wave: Systems Models

Researchers holding a domain-specific conception of giftedness emphasize specific areas of aptitude, and focus on the needs of those who are precocious in those areas to receive the acceleration or enrichment they need to progress at the appropriate skill level. Therefore, the focus is on acquiring a knowledge base and the development of intellectual abilities in a specific domain. The domain-specific modelers often do not include additional psychological processes in their model of giftedness, nor do they see them as necessary (Brody & Stanley, 2005; VanTassel-Baska, 2005). In their view, other psychological variables such as creativity are an output of giftedness, not an input, and can only come about after a significant amount of content has been mastered (VanTassel-Baska, 2005).

"Third Wave" giftedness researchers view giftedness as a system—the total operation which is dependent on a confluence of psychological processes operating together. This tight network of interacting psychological variables is posited to play a role across a wide range of creative behavior, but these conceptions do not exclude the importance of domain-specific abilities.

Joseph Renzulli's (1978, 2005) Three-Ring Definition views giftedness as the interaction of three characteristics: well-above-average ability, creativity, and task commitment. According to Renzulli, each characteristic plays an important role in the development of gifted behavior. Well-above-average ability is defined by Renzulli as either general ability that can be applied across all domains and/or specific ability, which consists of the ability to perform at a high level within a specific domain. Renzulli defines well-above-average ability as that possessed by those individuals performing in the top 15–20% of any domain. This view differs from the traditional view of giftedness as comprising those scoring in the top 3–5% on a standardized measure of intelligence (i.e., Marland, 1972).

Renzulli also has made a major impact on the field of giftedness by proposing that there are two types of giftedness: "schoolhouse giftedness" and "creative-productive giftedness." Schoolhouse giftedness is test-taking or lesson-learning giftedness, and is the form of giftedness most often emphasized in school. Creative-productive giftedness differs from schoolhouse giftedness: Those who display creative-productive giftedness are excellent producers of knowledge, whereas those high in schoolhouse giftedness are superior consumers of knowledge. According to Renzulli:

> History tells us it has been the creative and productive people of the world, the producers rather than consumers of knowledge, the reconstructionists of thought in all areas of human endeavor, who have become recognized as 'truly gifted' individuals. History does not remember persons who merely scored well on IQ tests (Renzulli, 2005, p. 256).

There is research evidence supporting the components of Renzulli's model. Delisle and Renzulli (1982) found that nonintellective factors are just as important for creative production as are intellectual factors. The model is also supported by the work of Gubbins (1982), who showed through stepwise multiple regression that above-average ability is a necessary but not suf-

ficient condition for high-level creative productivity. Also of importance are factors such as task commitment, time commitment, as well as student interest, which are factors that are directly related to Renzulli's model.

Renzulli's model benefits from its inclusion of multiple interacting factors and the broadening of the criteria used in selection of gifted students. However, the model does have its criticisms. Renzulli first proposed the three aspects of giftedness based on data from accomplished adults (Renzulli, 1978). Renzulli has been criticized for not demonstrating correlations between these later-life achievements and the traits or experiences of children with various levels of IQ (Delisle, 2003). Another criticism of the model, coming from those supporting the domain-specific view, is that motivation, task commitment, and creativity should be secondary considerations, because they are not part of giftedness, but rather are born out of the talent-development process (VanTassel-Baska, 2005). Renzulli has made an attempt to respond to various criticisms, by emphasizing the need to develop creative productive skills in addition to knowledge acquisition, and presenting evidence that his broadened identification procedures do indeed reduce inequalities such as a disproportionate representation of minorities in gifted education programs and gender equity (Renzulli, 1999).

Another important systems model of giftedness is Sternberg's WICS model of giftedness, in which giftedness is conceptualized as a synthesis of wisdom, intelligence, and creativity (Sternberg, 2003a, 2005; see also Niu & Sternberg, 2002, and Yang & Sternberg, 1997, for cultural perspectives). Wisdom is the use of one's abilities and knowledge to achieve a common good, by balancing one's own with others' and higher order interests, in the long- and short-terms, through the infusion of ethical values. (Successful) intelligence is the formulation and pursuit of a life course that matches one's personal goals and that enables one to capitalize on one's strengths while compensating for or correcting one's weaknesses. And creativity is the production of novel, surprising, and compelling ideas or products.

The basic idea of the WICS model is that, in life, people need creative skills and attitudes to produce new and original ideas; analytical skills and attitudes (academic intelligence) to evaluate the quality of these ideas; practical skills and attitudes (practical intelligence) to execute ideas and to persuade others of their value; and wisdom-related skills and attitudes in order to ensure that one's ideas help to foster a common good, rather than only the good of oneself and those closely associated with oneself. Gifted people, in this view, are not necessarily extremely strong in all of these aspects. Rather, they recognize and capitalize on their strengths, and recognize and compensate for or correct their weaknesses, in order to adapt to, shape, and select real-world environments. Evidence in support of this view is summarized in Sternberg (2003b). There is also some evidence for cross-cultural generalization of at least parts of the theory (Sternberg, 2004a, 2012).

The WICS model has also received various criticisms (see Sternberg, 2004b for a response to these criticisms). One criticism is that the WICS model does not address the relationship between creativity and psychiatric disorders (Dai, 2003; Kaufman & Baer, 2003). Another criticism is that the WICS model does not specify prediction of all aspects of all kinds of giftedness, such as elite athleticism (Baker & Cote, 2003). Another criticism is that the WICS model does not provide a readily purchasable detailed assessment procedure for identifying or instructing gifted children (Feldhusen, 2003; Heller, 2003). To be sure, though, these three criticisms could be applied to many of the conceptions of giftedness reviewed in this chapter. Lastly, the construct of wisdom has been called "overloaded" and "heterogeneously operationalized" (Heller, 2003).

Fourth Wave: Developmental Models

Developmental models were formulated in response to overemphasis on the genetic determinants of giftedness. Indeed, the word "giftedness" does imply that someone was bestowed with a special "gift" that must be harnessed for

the good of humankind, although, at least in theory, the gift need not be genetic. Developmental theories of giftedness emphasize the constantly changing nature of these so-called "gifts," and broaden the net even wider than the systems model by including various *external* factors that might interact with the *internal* factors of the individual to produce gifted behavior.

One of the first steps to include the environment in a model of giftedness was taken by Mönks (1992), who modified Renzulli's three-ring model to come up with the Multifactor model of giftedness. He essentially took Renzulli's model, and added environmental factors such as the school, family, and peers to the three psychological variables (motivation, creativity, and exceptional abilities) already posited by Renzulli.

Françoys Gagné (2005) proposed a theory of giftedness that emphasizes the talent-development process. He noted that the words "gifted" and "talented" are often used interchangeably in the field of gifted education; he proposed the Differentiated Model of Gifted and Talented (DMGT) to highlight the difference in these terms. The major aim of Gagné's model is to uncover the important environmental influences (home, school, parents, activities, encounters, etc.), nonintellective variables (motivation, temperament), and learning, training, and practicing, that transform basic, genetically determined "gifts" (intellectual, creative, sensorimotor, etc.) into specific talents (language, science, mathematics, art, music, leadership, etc.) in everyday life.

Abraham Tannenbaum (1986) proposed a related theoretical model that also attempts to delineate the contributing factors linking gifted potential to talent fulfillment. He suggested five psychological and social linkages between promise and fulfilment: (1) superior intelligence, (2) exceptional special aptitude, (3) nonintellective facilitators, (4) environmental influences, and (5) chance, or luck. These five factors are thought to interact to produce high levels of productivity, and are all necessary to become a "gifted" individual. Whereas Gagné uses the word "giftedness" as a potential, Tannenbaum uses the word as an outcome.

Through his studies of prodigies, David Henry Feldman, another developmental theorist, proposed a model of how talent grows or develops in young people (Feldman, 1992, 2000). According to Feldman, seven dimensions of development are particularly important for the development of giftedness: (1) cognitive processes, (2) social/emotional processes, (3) family aspects (i.e., birth order and gender within the family), (4) education and preparation (informal and formal), (5) characteristics of the domain and field, (6) social/cultural contextual aspects, and (7) historical forces, events, and trends.

John Feldhusen further formulated a developmental model of giftedness based on talent development that attempts to synthesize the various models of giftedness presented in this chapter (Feldhusen, 1998). For instance, he incorporated domain-specific abilities (Carroll, 1993; Gardner, 1983) with the idea that these basic abilities are in part genetically determined (Galton, Gagné), while also acknowledging that specific abilities emerge and develop through facilitating experiences, and within a particular sociocultural context (Csikszentmihlayi, 2013; Csikszentmihalyi, Rathunde, & Whalen, 1993). Like other "Fourth Wave" researchers, Feldhusen attempted to elucidate the transition from genetically determined abilities to the display of specific talents.

At the base of his model are "genetically determined abilities" that predetermine the nature and rate of intellectual, physical, and emotional development. When the child enters preschool and then primary school, stimulating conditions that foster intellectual, physical, and emotional growth are important, such as peers and teachers. With instruction, there may emerge rapid growth of knowledge and evidence of precocity. The next stage is elementary school, where precocious children may start to display evidence of their special talent. The next stage (ages 12–16) involves the learning of knowledge and skills under the tutelage of excellent teachers. During this stage, a range of personality factors also become important, including internal locus of control, intrinsic motivation, and a sense of self-efficacy (see Dai & Sternberg, 2004). Also during this stage, both commitment to talent develop-

ment and career goals start to emerge, and personal interests become more clear. The final stage involves integration through appropriate educational experiences, such as profiting from high-powered and highly able mentors, resisting peer pressure to be normal, and finding the career opportunities that open doors to high-level and creative achievement.

Dabrowski (1964, 1967) also has proposed a "positive disintegration" model of giftedness, according to which gifted individuals tend to be highly excitable in particular areas of endeavor, in particular, psychomotor, sensual, intellectual, imaginative, and emotional. The idea is similar to one of Ellen Winner (1996), who has suggested that gifted children have a "rage to master" in domains of superior skills, although Dabrowski's "overexcitabilities" (OEs) are more domain general. In fact, recent research suggests that Dabrowski's OEs can be almost perfectly mapped on to the openness-to-experience personality domain of the Big Five (Vuyk, Krieshok, & Kerr, 2016).

Grounding giftedness in modern personality science and developmental psychology, Kaufman (2013) proposed the Theory of Personal Intelligence. Personal intelligence is defined as the "dynamic interplay of engagement and ability in the pursuit of personal goals." According to this theory, people have different forms of engagement that captures their attention, and it's the constant interplay of motivation, persistence, and skill development that causes intelligence to develop. The level of analysis in this framework is the whole person, not individual differences. Each person is a dynamic system of motivational, emotional, personality, and cognitive processes. Therefore, the Theory of Personal Intelligence integrates systems theories of giftedness with developmental theories of giftedness, and shifts the focus of analysis from comparing children on a single dimension (e.g., IQ, creativity) to assessing growth within an individual, comparing a person's former self to their current self. The concept of personal intelligence bears some relation to Sternberg's (1997a) successful intelligence and Gardner's (2011) intrapersonal intelligence.

Common and Uncommon Ground: The Evolution of Conceptions of Giftedness

It should be evident by this point that there are numerous and diverse conceptions of giftedness available (for even more conceptions see Renzulli & Gubbins, 2009, Sternberg & Davidson, 2005; Pfeiffer, 2015). It may seem overwhelming sifting through them all. If the fine details are ignored temporarily, a big picture does emerge. Modern conceptions of giftedness are a result of an evolution of ideas. Each generation of giftedness theories is built on earlier ones, incorporating the previous generation's ideas and adding extra components that reflect the current state of research.

First-wave researchers laid the foundation by asking the question, "what is giftedness?" in the first place, and introducing intelligence tests to measure it. Second-wave researchers built on the foundation of intelligence theory by discovering multiple, distinct ways to be gifted. Third-wave researchers recognized the importance of both domain-general and domain-specific proclivities, but also added other psychological variables they felt were important components of giftedness. Fourth-wave researchers widened the lens even more, taking many of the ideas of the first three generations of giftedness researchers, but placing talent within a developmental context that includes variables external to the individual such as the environment.

Looking at the big picture, it is clear that modern giftedness researchers share the same goal: the identification and nurturance of specific talents. No serious giftedness researcher today believes that general intelligence is the whole picture, or believes that gifted abilities are solely the result of innate, genetic endowment. If anything, the trend over the past 20 years has been to emphasize external factors over internal factors. There seems to be a shift toward *explaining* the talent-development process (fourth wave) instead of merely listing static traits that are important to achieve giftedness (third wave).

When the fine details *are not* ignored, however, differences between the various conceptions of giftedness do emerge. Three main areas of

contention include the importance of nonintellective abilities, the role of creativity in giftedness, and whether giftedness is a potential or an achievement. Domain-specific researchers such as Julian Stanley have tended to argue that precocious students need to build up their base of expertise in a particular domain. As a result, they view giftedness as, in large part, an achievement. They downplay the importance of nonintellective abilities and view creativity as part of the end product instead of part of the process. Systems researchers such as Renzulli and Sternberg place creativity on equal footing with intelligence, and emphasize the need to teach creativity-based skills in addition to critical-thinking skills. Indeed, Renzulli has downplayed the role of conventional intellectual abilities, proposing less stringent criteria for scores on standardized measures of intelligence for inclusion of children in gifted programs. Systems researchers agree with the domain-specific researchers, however, that giftedness is achievement. Developmental theorists such as Gagné view giftedness as potential, and talent as the end product. In addition, developmental theorists emphasize, to a large extent, the role of nonintellective abilities and creativity for talent to emerge. For both systems and developmental giftedness theorists, intelligence and expertise are important, but are one piece of a large network of interconnected elements.

The particular conception of giftedness that is adopted has important implications for educational practice. First we look at implications for the identification of gifted students, and then we look at some examples of actual programs based on modern conceptions of giftedness.

Identification of Gifted Students

Each conception of giftedness brings with it its own set of implications for education. Those still working within the domain-general framework set up by Terman will be advocates of using a global IQ score as a cutoff for identification. Those adopting a domain-specific perspective will be advocates of using the results of the group factor scores on intelligence tests, as well as other demonstrations of high achievement in a specific domain. Those adopting a systems view believe in identifying students through a combination of assessments of analytical, creative, wisdom, and task-commitment skills in a specific domain or across the board. These researchers emphasize alternative assessments that do not rely solely on intelligence tests. Lastly, those adopting a developmental view emphasize the malleability of giftedness, and its constantly changing nature. Therefore, they argue for different types of assessments at different ages, starting with intelligence tests at a very early age, and ending up focusing on achievement at the later stages of talent development.

What is the Dominant Model in the USA Today?

When all is said and done, what conception of giftedness is the dominant model in practice in the USA? First-wave giftedness researchers have had, to date, the most enduring impact on modern-day education. Modern conceptions of giftedness receive little attention in the typical school setting. In the USA, a global IQ score is still the dominant criterion used for acceptance into gifted programs at the grade-school level (Feldhusen & Jarwan, 2000; McClain & Pfeiffer, 2012; Silverman, 2013). In fact, several states prescribe a minimum score on an intelligence test in order for a gifted program to be eligible for funding (US Department of Education, 1993). This is curious, because modern giftedness researchers emphasize domain-specific notions of giftedness.

There are at least two probable reasons why educators still rely so heavily on measures of IQ. The first is simply a matter of availability. Educators want to use a test that is cheap, reliable, and valid. Most IQ tests meet these criteria (Jensen, 1998; Silverman, 2013). Furthermore, IQ tests are often grounded in CHC theory, which has gained wide acceptance by psychometrically oriented intelligence researchers. No modern theory of giftedness has received such widespread acceptance among intelligence researchers, or has produced a test that is as quick, reliable, and valid as the IQ test. Because modern conceptions of giftedness go way beyond intelligence, they

have likewise (and rightfully so) insisted on going beyond quick simple tests to measure giftedness (see *Linking Theory to Practice* section). This poses a problem, because most schools still operate on the first wave model initiated by Terman, which equates giftedness with general intelligence. Until educators enter the twenty-first century of theories of giftedness, they will stay in the intelligence testing frame of mind and modern theories of giftedness will not be widely adopted.

The second probable reason why educators still rely so heavily on the IQ measure is because IQ tests actually do match the generality of most gifted education programs. The identification procedure should match the intervention program, and in many schools, that is what IQ tests do. IQ tests are moderately effective predictors of academic achievement *in general*. In addition, most gifted-education programs take students who are achieving at a high level in general, and put them all in the same room, where they teach the students general critical-thinking skills. Luckily, modern conceptions of giftedness are starting to link their conceptions to practice, and are implementing programs to do so (Peters, Matthews, McBee, & McCoach, 2013). Hopefully educators will start to see which of these programs are most successful, and will start to switch over from general gifted programs to specific programs that identify and nurture specific abilities.

There are new assessments on the horizon that may eventually change the assessments we use (e.g., Sternberg, 2010, 2016; Sternberg & the Rainbow Project Collaborators, 2006). One new test, the Rainbow assessment, has been found roughly to double prediction of SAT for freshman college grades in a diverse sample of students, and substantially to reduce ethnic-group differences in test scores. The assessment measures creative and practical in addition to analytical skills. The creative measures were the most useful in increasing prediction. Another measure, Aurora, is an analogue to Rainbow for younger children (Chart, Grigorenko, & Sternberg, 2008).

In the next section, we review examples of some of these "new wave" programs, both in the USA and abroad (for a more complete listing see Chap. 13, this volume).

Linking Theory to Practice

Programs Based on the Theory of Successful Intelligence

To validate the relevance of the theory of successful intelligence (the WICS theory without the wisdom component) in the classroom, we have carried out a number of instructional studies. In one study (Sternberg, Ferrari, Clinkenbeard, & Grigorenko, 1996; Sternberg, Grigorenko, Ferrari, & Clinkenbeard, 1999), we used the Sternberg Triarchic Abilities Test, based on the triarchic theory of intelligence positing distinct analytical, creative, and practical abilities (Sternberg, 1984). The test was administered to 326 children around the USA and in some other countries who were identified by their schools as gifted by any standard whatsoever. Children were selected for a summer program in (college-level) psychology if they fell into one of five ability groupings: high analytical, high creative, high practical, high balanced (high in all three abilities), or low balanced (low in all three abilities). Students who came to Yale were then divided into four instructional groups. Students in all four instructional groups used the same introductory-psychology textbook (a preliminary version of Sternberg, 1995) and listened to the same psychology lectures. What differed among them was the type of afternoon discussion section to which they were assigned. They were assigned to an instructional condition that emphasized either memory, analytical, creative, or practical instruction. For example, in the memory condition, they might be asked to describe the main tenets of a major theory of depression. In the analytical condition, they might be asked to compare and contrast two theories of depression. In the creative condition, they might be asked to formulate their own theory of depression. In the practical condition, they might be asked how they

could use what they had learned about depression to help a friend who was depressed.

Students in all four instructional conditions were evaluated in terms of their performance on homework, a midterm exam, a final exam, and an independent project. Each type of work was evaluated for memory, analytical, creative, and practical quality. Thus, all students were evaluated in exactly the same way.

Several relevant results came out of this study. First, we observed that when the students arrived at Yale, the students in the high creative and high practical groups were much more diverse in terms of racial, ethnic, socioeconomic, and educational backgrounds than were the students in the high analytical group, suggesting that correlations of measured intelligence with status variables such as these may be reduced by using a broader conception of intelligence.

Second, all three ability tests significantly predicted course performance. Also, students who were placed into an instructional condition that matched their pattern of successful intelligence abilities performed better than those who were poorly matched. In other words, when students are taught in a way that fits how they think, they do better in school. Children with creative and practical abilities, who are almost never taught or assessed in a way that matches their pattern of abilities, may be at a disadvantage in course after course, year after year.

A follow-up study (Sternberg, Torff, & Grigorenko, 1998) examined learning of social studies and science by third graders and eighth graders. The 225 third graders were students in a very-low-income neighborhood in Raleigh, North Carolina. The 142 eighth graders were students who were largely middle to upper middle class studying in Baltimore, Maryland, and Fresno, California. In this study, students were assigned to one of three instructional conditions. In the first condition, they were taught the course that basically they would have learned had there been no intervention. The emphasis in the course was on memory. In a second condition, students were taught in a way that emphasized critical (analytical) thinking. In the third condition, they were taught in a way that emphasized analytical, creative, and practical thinking. All students' performance was assessed for memory learning (through multiple-choice assessments) as well as for analytical, creative, and practical learning (through performance assessments).

As expected, students in the successful-intelligence (analytical, creative, practical) condition outperformed the other students in terms of the performance assessments. One could argue that this result merely reflected the way they were taught. Nevertheless, the result suggested that teaching for these kinds of thinking succeeded. More important, however, was the result that children in the successful-intelligence condition outperformed the other children even on the multiple-choice memory tests. In other words, to the extent that one's goal is just to maximize children's memory for information, teaching for successful intelligence is still superior. It enables children to capitalize on their strengths and to correct or to compensate for their weaknesses, and it allows children to encode material in a variety of interesting ways.

We have now extended these results to reading curricula at the middle-school and the high-school level. In a study of 871 middle-school students and 432 high-school students, we taught reading either triarchically or through the regular curriculum. At the middle-school level, reading was taught explicitly. At the high-school level, reading was infused into instruction in mathematics, physical sciences, social sciences, English, history, foreign languages, and the arts. In all settings, students who were taught triarchically substantially outperformed students who were taught in standard ways (Grigorenko, Jarvin, & Sternberg, 2002).

However, when my colleagues and I hugely upscaled our intervention to many thousands of students and large numbers of teachers and schools, our results were much less impressive (Sternberg et al., 2014). We learned how hard it is to make things work when we had inadequate controls over the fidelity of the implementation in a wide variety of school cultures.

Thus, the results of these studies suggest that the theory of successful intelligence is largely valid as a whole, although like any other theory,

how well it works in practice depends on the fidelity of the implementation. Moreover, the results suggest that the theory can make a difference not only in laboratory tests, but in school classrooms and even the everyday life of adults as well.

Programs Based on the Three-Ring Model

Renzulli's Three-Ring conception of giftedness has served as the basis for a series of practical models (see Renzulli & Reis, 1994 for a full description of the models as well as their research findings). First, Renzulli (1977) proposed the Enrichment Triad programming model and then the revolving door identification model (Renzulli, Reis, & Smith, 1981).

The Enrichment Triad offers three types of enrichment experiences for students. Type I Enrichment involves general exploratory experiences for students, such as field trips and guest speakers. Type II Enrichment includes instructional methods and materials designed to promote the development of thinking, feeling, research, communication, and methodological processes. Type III Enrichment is the most advanced level and allows the students to participate in investigative activities and artistic production. Type III was designed to allow gifted students to work at as advanced a professional level as possible.

Using a population of 1162 students in grades 1–6 in 11 school districts, Reis and Renzulli (1982) examined several variables related to an identification process based on the Enrichment Triad programming model and the revolving door identification model. Above-average-ability students at each grade level were divided into two groups. Group A consisted of students scoring in the top 5% of standardized tests of intelligence and achievement. Group B consisted of students who scored from 10 to 15 points below the top 5% on a standardized intelligence test or were rated highly by teachers using the Scales for Rating the Behavioral Characteristics of Superior Students (Renzulli, Smith, White, Callahan, & Hartman, 1976; Renzulli et al., 2002). Both groups participated in all program activities.

The Student Product Assessment Form (SPAF) was used to compare the quality of products from each group. The instrument provided ratings for eight characteristics of product quality and seven factors relating to overall quality. There was no significant difference between the two groups with respect to the quality of students' products. The results from this study supported the effectiveness of a model that focuses on creative productivity, in addition to lending support to the Three Ring Conception of giftedness as comprising students who represent larger proportions and different populations than the traditional top-5% approach.

In addition, questionnaires and an interview were administered to assess feelings about the program. Many classroom teachers reported that high involvement in the program influenced their teaching practices in a positive way. Also, the opinions of the parents of children who were placed into gifted programs based on traditional criteria did not differ from the opinions of parents of children who were selected under the expanded Three Ring criteria. Finally, special-education teachers indicated their preference for the expanded talent pool approach compared to the strict reliance on IQ scores.

Most recently, Renzulli combined the Enrichment Triad Model and the Revolving Door Identification Model with the Schoolwide Enrichment Triad Model (SEM; Renzulli & Reis, 1985, 1997). A central aim of the SEM model is to apply the general enrichment techniques that were used in the Triad/Revolving Door Identification Model to help *all* students, not just those identified as gifted.

The SEM model offers educators three service-delivery components (Renzulli & Reis, 1994). The first component is the Total Talent Portfolio (TTP), which is used as a way of gathering and recording students' abilities, interests, and learning style preferences. The second component involves a series of Curriculum-Modification Techniques that are designed to (1) assess each student's mastery of material, (2) adjust the pace and level of required

material to accommodate variations in learning, and (3) provide enrichment and acceleration alternatives for students who master material at a faster rate. The third component involves a set of strategies designed to promote active engagement in learning.

The SEM model has been implemented in several hundred school districts across the USA (Burns, 1998), and has demonstrated effectiveness under widely differing socioeconomic levels and program organization patterns (Olenchak, 1988; Olenchak & Renzulli, 1989). In addition, over 600 educators are trained on the model each summer at the University of Connecticut.

SMPY Program

The SMPY program uses content-specific criterion-reference measures for identification instead of standardized measures of intelligence that measure general reasoning abilities. The main emphasis is on an optimal match between a student's particular cognitive abilities and the educational program.

The SMPY program has developed the Diagnostic Testing-Prescriptive Instruction Model, which gives high-achieving students pretests that diagnose specific content that has not yet been mastered, and structures a program to teach only that content (Stanley, 2000). SMPY then counsels students to help develop challenging individualized programs. This approach, which is part of CTY's Study of Exceptional Talent Program, helps students before the age of 13 with high math or verbal ability to find opportunities to accelerate and/or supplement their regular school programs (Brody, 2004; Brody & Blackburn, 1996). Interventions have taken the form of academic summer programs, distance education, and extracurricular opportunities. A series of longitudinal studies have been implemented to test the effectiveness of Stanley's model. Based on the results of these studies, Swiatek (1993) concluded that acceleration is an educational option that is inexpensive to implement, requires little specialized training for teachers, and can be used in most educational settings to meet the learning needs of many gifted students. In addition, it was concluded that acceleration does little harm to willing students academically or psychosocially, and may help gifted individuals establish a foundation for advanced learning, maintain interest and involvement in academic activities, and earn extra time that can be used for the development of a career.

German Programs

There was a time when German researchers were weary of identifying students for special gifted programs (Bartenwerfer, 1978). Gradually, they saw a need for identification and today a variety of programs are being implemented in Germany to identify and nurture talent. In 1988, the Center for the Study of Giftedness was established. It adopted the Multifactor Model of giftedness (Mönks, 1992), based on the notion that giftedness is not identical to high IQ. The Center agreed to exclude any mention of a student's IQ in reports to parents and teachers.

A model that has been adopted widely in Germany for identifying giftedness is the ENTER model (Ziegler & Stoeger, 2003). The ENTER model not only assesses the current state of the child (e.g., IQ score), but also incorporates developmental issues into the identifying process. ENTER stands for five stages: explore, narrow, test, evaluate, and review. In the first three stages, a variety of data are collected on the child. In addition to tests of ability, information such as family life, early development, school experiences, leisure-time activities, and friends are collected. During the first three steps, objectives are narrowed.

The collected information and test results guide the evaluation stage, during which a decision is made as to the appropriate provisions. The review phase monitors the child continuously to determine the reasons for the initial identification and to make sure there is a good fit between the model of giftedness that was used for identification and the practical recommendation that was made in the evaluation phase.

Jena Plan Schools are a significant way to promote giftedness in Germany and across Europe. The schools were founded by the German educator and scientist Peter Peterson. His original intention was to establish a school not just for gifted students, but for children with all levels of ability (Mönks & Katzko, 2005). The schools were established with six basic principles in mind. First, the schools are integrated into the social environment, and do not solely focus on the development of intellectual abilities. Second, the age-graded class was replaced by a family structure with three different levels: lower, middle, and upper. Each level comprises three different age groups. Third, pull-out instruction groups are based on the ability and level of the child. Fourth, students are grouped around tables, with four to six children in a group. The purpose of these small groups is to facilitate social and cooperative learning and teamwork. The teacher can bring together both good and slow learners for a given group. Fifth, the school reflects natural learning situations in everyday life as much as possible. The weekly curriculum is organized around conversation, play, work, and celebration. Sixth, social learning is emphasized. Students work and play with one another. The Jena Plan Schools are an excellent example of modern conceptions of giftedness being translated into educational practice.

The Future of "Giftedness"

What does the future hold for the giftedness construct, and what will future conceptions of giftedness be like? Based on the current trends, the sociocultural approach to giftedness is probably not going away anytime soon. As more and more factors are taken into account in models of giftedness, one has to ask at some point: which models are not only theoretically sound, but can be practically implemented in the school system? As the lineup of conceptions of giftedness expands, the field needs to become both scientific and practical at the same time. Richard Mayer suggests that, in order to do this, the giftedness construct needs to be precisely defined and measured, theories should be clear and testable, conclusions on how to identify and nurture gifted students should be based on solid research findings, research methods that generate valid and reliable data should be used, and gifted programs based on a particular conception of giftedness should be evaluated in controlled experimental trials (Mayer, 2005).

This all is a tall order indeed. Nonetheless, the need for a more scientific approach to the study of giftedness reflects the fact that there are many conceptions available, and a number of programs are succeeding in identifying and nurturing youth. This is an exciting time for the field of gifted education, with more options available for children than at any other point in history. The particular conception of giftedness that is adopted is important and will become increasingly more important in the future, and will have strong implications for the development of talent. Yes, the future of gifted education looks bright and gifted indeed.

Conclusion

There is something profoundly unsatisfying about a chapter that reviews a number of diverse theories and ends with a statement that there is some merit to all, and it is up to the reader to find those merits and decide what he or she likes best. Rather than arguing for any particular point of view, we will conclude by mentioning three characteristics that we consider to be requisites for a model to be useful.

First, the model should use multiple and varied assessments. All instruments used to assess children have error of measurement. Different kinds of instruments have different kinds of error. IQ tests, for example, tend to be more reliable than many of their competitors, but they are also narrower, and are easier for children from certain cultural backgrounds than for those from others. By having multiple, diverse assessments, educators can guard against the errors of measurement inherent in any one technique.

Second, the model should take into account nonintellective personal variables. If one looks at people who succeed in their professions and in

their life, it would be fair to say that *none* of them has succeeded on the basis of intellect alone, or at least, intellect narrowly defined. They succeed in large part because of task engagement, focused personal goals, and passion (Duckworth, 2016; Kaufman, 2013; Kaufman & Gregoire, 2016). Motivation, creativity, wisdom, initiative, courage, stamina, and many other variables help differentiate those who have an impact on the world from those who do not. Merely looking at intellective variables will leave one with an incomplete model, no matter how many measures one employs.

Third, the model should take into account contextual variables, such as enculturation and socialization. Children brought up with English as a second language, or brought up in a home that emphasizes obedience above all else, will come to school with a pattern of skills different from children coming from homes that encourage, say, critical and creative thinking. Heath (1983) showed how intelligence can be socialized in different ways in different groups (see also Sternberg & Suben, 1986). In assessing children, their backgrounds should be taken into account.

If there is one trend in recent work on giftedness, it is recognizing the importance of wisdom and ethics for identifying and developing gifted individuals (Gardner, Csikszentmihlayi, & Damn, 2002; Renzulli, Koehler, & Fogarty, 2006; Sternberg, Sternberg, 2004c, Sternberg, 2016, Sternberg, 2017). If we want to develop students who are going to change the world in a positive, enduring, and meaningful way, and who can solve real-world problems and not just academic ones (Davidson & Sternberg, 2003; Sternberg, 1981), we will no't do it by selecting students merely on the basis of standardized tests or by teaching them in ways that develop only their academic knowledge and skills. Gifted people are not immune from foolishness (Sternberg, 2002). Indeed, their confidence in their own gifts may lead them to make foolish decisions simply because they believe they are incapable of doing so. If we do not develop wisdom in our gifted children, we run the risk of the smart people who have contributed to so many of the world's ills, such as climate change, increasing inequality, ever better weapons for fighting wars, and imaginary distinctions regarding intellect among members of different racial groups (Sternberg, Grigorenko, & Kidd, 2005).

In sum, there probably is no unique right way to identify children as gifted. There are multiple ways. But good identification procedures take into account the three principles above. Some procedures actually follow none of these principles, assigning children to gifted classes on the basis of a single test, such as an IQ test. We can do better, and given the current state of our knowledge, we must do better if we want to do justice to our children, our schools, and our societies.

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4 The Social and Emotional World of the Gifted

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Abstract

The social and emotional world of the gifted encompasses both an exploration of their unique social and emotional characteristics and experiences, and the psychosocial skills necessary to develop their talents. Using the construct of asynchronous development, we explore a few social and emotional characteristics and experiences that may arise due to advanced intellectual development as compared to social and emotional development. We then discuss a number of psychosocial skills that are crucial for the development of talent.

Do gifted individuals have unique characteristics that render them particularly vulnerable to an array of social and emotional problems? Do "the characteristics associated with giftedness … make the subjective experience of meeting normal challenges qualitatively different from others' experience" (Peterson, 2009, p. 281)? Or are the social and emotional difficulties some gifted individuals face due to interaction with an environment that does not facilitate the development of their talents? In other words, do gifted students have unique social and emotional needs? Or are gifted students more vulnerable to social and emotional difficulties than average-ability students because of environmental constraints and a lack of psychosocial skill development?

For hundreds of years, the general belief among most folks was that highly intelligent individuals were doomed to lives of social isolation, emotional instability, and psychopathology. Terman (1925) was the first to challenge that notion with his longitudinal study of 1528 children with IQs above 140. Terman and his colleagues found that gifted children were average in many respects, including social adjustment and emotional stability. However, critics of Terman's work point out that the gifted children in his study were all intellectually gifted and identified as so by their teachers, and there was very little ethnic or economic diversity in his sample. The generally positive adjustment found among these gifted children may not have been found among similarly able children who were not selected for Terman's study (Gross, 2004; Vialle, 1994). Regardless, though, Terman's work was influential and changed the way we view highly intelligent individuals, particularly with regard to their social and emotional development.

Hollingworth (1926, 1942) also made significant contributions to our understanding of the social and emotional development of gifted indi-

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viduals. Hollingworth examined the peer relationships of children at differing ranges of intellectual giftedness. She conducted her research in public school classrooms and discovered differences in the cognitive and affective development of moderately (IQ 125–155) and highly (IQ greater than 160) gifted children. Moderately gifted children were found to be socially well-adjusted and self-confident, but the highly gifted children struggled with social isolation because of difficulties finding intellectual peers (Hollingworth, 1926). Yet when these highly gifted children were permitted to work and play with their intellectual peers, regardless of chronological age, their social isolation largely disappeared (Gross, 2004).

Both Terman and Hollingworth set the stage for the study of the social and emotional development of gifted individuals, which we continue to study today. Contemporary approaches to studying the social and emotional world of gifted children and adolescents are varied. Giftedness may still be equated with anything from socially awkward behavior to "madness" in popular culture, but current research findings on the social and emotional characteristics of gifted individuals are largely positive. Most research focuses on factors that might place gifted students uniquely at risk for social and emotional difficulties (Neihart, Pfeiffer, & Cross, 2015) or those psychosocial factors that might enhance the development of talent (see Rinn, 2012). These two approaches to studying the social and emotional world of the gifted can be somewhat aligned with the paradigmatic approach to giftedness that a researcher takes.

If we approach the notion of giftedness as that of a high IQ (e.g., IQ > 130) (per the Gifted Child Paradigm, see Dai & Chen, 2014), we see asynchronous development among gifted individuals, whereby the advanced intellectual capabilities of a child as compared to the typical developmental trajectories related to physical, social, and emotional milestones result in social and emotional issues unique to the gifted population. In other words, social and emotional issues and vulnerabilities arise because of this asynchronous developmental pattern between intellectual or cognitive abilities and social, emotional, and physical development. As we do with typically developing populations, though, we must also realize that intellectual/cognitive development and social, emotional, and physical development are intertwined among the gifted, too.

> Emotions cannot be treated separately from intellectual awareness or physical development. All three intertwine and influence each other. A gifted 5-year-old does not function or think like an average 10-year-old. He does not feel like an average 10-year-old, nor does he feel like an average 4- or 5- year old. Gifted children's thoughts and emotions differ from those of other children, and as a result, they perceive and react to their world differently. (Roeper, 1995, p. 74).

On the other hand, if we view giftedness as something more broad than just high IQ, say as enhanced academic abilities or special talents (per the Talent Development Paradigm, Dai & Chen, 2014), unique social and emotional issues may not arise if asynchronous development is not a concern. Instead, we may focus on the affective issues that could impact the pursuit of expertise or eminence, such as persistence, goal-directed behavior, and academic self-beliefs, among talented individuals.

Regardless of your theoretical or paradigmatic perspective, though, we can see that giving attention to one's social and emotional development *and* the development of one's psychosocial skills is imperative to the healthy functioning of individuals and the development of their gifts and talents. High ability is not enough to ensure success or eminence in adulthood, and social and emotional growth is an important factor in transforming childhood potential and ability into success or eminence in adulthood (Olszewski-Kubilius, Subotnik, & Worrell, 2015a). Social and emotional development occurs over a lifetime (Cross, 2009) and "we simply must take into account the psychological, social, and emotional needs of gifted individuals in order to encourage and support talent development… the academic needs of gifted individuals *cannot* be met without simultaneously addressing their psychosocial

needs" (Rinn, 2012, p. 207). The purpose of this chapter is thus to explore findings from existing research regarding the social and emotional development of gifted children and adolescents, as well as known psychosocial skills that aid in the development of talent. We first examine the construct of asynchronous development, as it is typically seen as the precursor to social and emotional difficulties that might arise among the gifted.

Asynchronous Development

Asynchronous development has come to mean being out of sync within oneself, or having uneven rates of development. A gifted individual's intellectual development occurs much more quickly than his or her social, emotional, and physical development, which are typically in line with chronological-age peers (although social, emotional, and physical development could be advanced or delayed, depending on the individual). The notion of asynchronous development was included in the definition of giftedness provided by The Columbus Group (as cited in Tolan, 2013):

> Giftedness is asynchronous development in which advanced cognitive abilities and heightened intensity combine to create inner experiences and awareness that are qualitatively different from the norm. This asynchrony increases with higher intellectual capacity. The uniqueness of the gifted renders them particularly vulnerable and requires modifications in parenting, teaching, and counseling in order for them to develop optimally. (p. 21)

To understand the social and emotional implications of advanced intellectual development, we must first examine what we mean by advanced intellectual development. While a thorough discussion of the operationalization of advanced intellectual development is beyond the scope of this chapter, we can briefly conceptualize it to mean a number of different things. For example, the development of abstract thought is typically accelerated for gifted individuals in comparison to average-ability individuals (Moon, 2009). Mental age, as compared to chronological age, can be an indicator of asynchronous development (Binet & Simon, 1908). The early acquisition of symbol systems, particularly language, can affect the developmental trajectory of cognitive and abstract reasoning ability (Vygotsky, 1962). Brain wave activity is different in gifted versus average-ability children (Bell & Fox, 1992), and the speed of information processing is faster in gifted than in average-ability children (Duan, Dan, & Shi, 2013). All of these characteristics of advanced intellectual development can shift the typical developmental trajectory and lead to differing social and emotional developmental trajectories, experiences, and needs among gifted individuals. A number of experiences that may arise because of asynchronous development are discussed next, including perfectionism, sensory sensitivity, emotional intensity, and issues with social interactions, followed by a discussion of psychosocial factors that may enhance the development of talent.

Perfectionism

Perfectionistic individuals have been described as "setting unrealistically high standards, rigidly adhering to them, and defining their self-worth in terms of their achieving these standards" (Shafran & Mansell, 2001, p. 880). Healthy characteristics in some perfectionistic people, such as striving for excellence and having high expectations for oneself, can prove helpful in life (Stoeber & Otto, 2006), while unhealthy characteristics of perfectionism can be debilitating and can cause performance to suffer. For example, fear of failure can lead a perfectionist to avoid a task altogether and develop underachievement tendencies. In relation to underachievement and perfectionism, in particular, Grobman (2006) identified perfectionism as a self-destructive behavior. Rather than using errors for growth opportunities, gifted learners tend to approach incorrectness as failure. This fear of failure can then lead to procrastination, avoidance of the task, or withdraw from school or peers (Grobman, 2006; Mofield, Parker Peters, & Chakraborti-Ghosh, 2016). Further, perfectionism has been

linked to anxiety, depression, suicide, and eating disorders, among other forms of psychopathology (Affrunti & Woodruff-Borden, 2014; Kiamanesh, Dyregrov, Haavind, & Dieserud, 2014; Shafran & Mansell, 2001).

There are a number of ways to conceptualize and measure perfectionism in the research literature, but most distinguish between "perfectionistic striving" and "perfectionistic concerns" (Rice & Ray, 2018, p. 646). For example, one way to view perfectionism is Hewitt and Flett's (1991) distinction between self-oriented and socially prescribed perfectionism. Self-oriented perfectionism is an internally motivated belief that perfection is important. Socially prescribed perfectionism is an externally motivated belief that perfection is important to others, leading one to believe that others expect him/her to be perfect and that others will be highly critical if he/she is not perfect. Socially prescribed perfectionism is viewed as the more maladaptive variety (Hewitt & Flett, 1991). Most research, then, focuses on what researchers have termed the "unhealthy" or "maladaptive" aspects of perfectionism.

Perfectionism Among Gifted Versus Non-gifted Groups

Perfectionism is a characteristic believed to be common among gifted learners, but has often been viewed as a double-edged sword. Perfectionism can lead to positive outcomes if the student strives to do his or her best instead of worrying about making mistakes (Stoeber & Otto, 2006), but what happens when he or she fails to do so? What happens when the drive to succeed produces undesirable consequences? With both positive and negative views of this both desired and undesirable trait, perfectionism becomes a complex phenomenon among the gifted.

It is important to note that several studies have found gifted individuals to be no more perfectionistic than their average-ability counterparts (LoCicero & Ashby, 2000; Parker & Mills, 1996). However, it is generally thought that many gifted children are academic perfectionists and place high personal standards on themselves, particularly in the classroom (Basirion, Majid, & Jelas, 2014; Speirs Neumeister, Williams, & Cross, 2007; Wang, Fu, & Rice, 2012), and some (Portešová & Urbánek, 2013) suggest rates of perfectionism among gifted students are increasing. Gifted children may even perceive pressure from their parents, peers, or teachers to perform in what they believe is a "perfect" manner (Cross & Cross, 2015).

In a study of gifted seventh and eighth graders, Schuler (2000) found 87.5% of the students exhibited strong perfectionistic tendencies, with almost 30% of the gifted students in this study scoring in the maladaptive range. Similarly, Basirion et al. (2014) conducted a study of gifted adolescents in Malaysia and found only 11.8% were non-perfectionistic. The majority of the students, or 58.7%, were categorized as maladaptive perfectionists. Orange (1997) found 89% of her sample of 109 gifted adolescents scored in the negative perfectionism range. Dixon, Lapsley, and Hanchon (2004) examined perfectionism among a sample of 142 adolescents and found 42% of them had scored in the maladaptive perfectionism range. Vandiver and Worrell (2002) found about 10% of their sample of 342 gifted middle school students experienced maladaptive perfectionism. A number of factors may impact whether or not a gifted student is perfectionistic, including gender, age/grade level, and birth order.

Perfectionism and Gender

There is little consensus on gender differences among gifted individuals with regard to perfectionism. Baker (1996) found gifted girls to report higher levels of perfectionism than gifted boys. Chan (2007) examined perfectionism in gifted students from Grades 2 to 12. He found girls gave themselves higher ratings than did boys on a measure of positive perfectionism. Yet, Chan (2009) found gifted boys more likely to be negative or maladaptive perfectionists than girls. And, Tsui and Mazzocco (2007) found no

differences between sixth grade, mathematically gifted boys and gifted girls on perfectionism scores.

Perfectionism and Birth Order

Research conducted with average-ability students has found birth order position to be an important component in shaping a child's personality. Adler (1963) was among the first to suggest a child's birth order position impacts the way parents treat and raise the child, resulting in different personality traits based on birth order. First born or only born children typically have a higher need for achievement than later born children, which, if exaggerated, can mimic or turn into perfectionistic thinking. Using a sample of gifted adolescents, Margot and Rinn (2016) found gifted, first born children were more likely to be identified as perfectionists. Parker (1998) found only children more likely to be healthy perfectionists. He also found youngest children least likely to be unhealthy perfectionists or to even experience perfectionism at all.

Perfectionism and Age/Grade Level

Research that examines perfectionism among gifted individuals across ages or grade levels is also limited. Researchers have examined perfectionism with samples of gifted middle school students (LoCicero & Ashby, 2000; Schuler, 2000; Vandiver & Worrell, 2002), gifted high school students (Dixon et al., 2004), and gifted college students (Speirs Neumeister, 2004a, 2004b, 2004c), but comparisons across grade levels or ages are limited. Middle school and high school are of particular interest to researchers who study perfectionism (see Margot & Rinn, 2016), because during adolescence, individuals become more self-conscious and this could imply an increase of socially prescribed pressures to get things just right (Flett & Hewitt, 2002). Chan (2007, 2009) compared gifted primary and secondary students on measures of perfectionism and did not find any statistically significant differences between the groups. However, Kline and Short (1991) found gifted high school aged girls to report higher levels of perfectionism than gifted girls in lower grades.

Sensory Sensitivity and Emotional Intensity

The assumed association between sensitivity, intensity, and intellectual ability is not a new one. Galton (1874) claimed that individuals with higher levels of cognitive abilities are more capable of accurate sensory discrimination and are more emotional than individuals with lower levels of cognitive abilities. Galton was likely inspired by Locke (1690), who suggested that knowledge, which he believed formed the foundation for cognitive functioning, derives from sensation and perception. In modern times, while the empirical research is limited, numerous scholarly books have been written on the sensory sensitivity and emotional intensity of gifted individuals (Crawford, 2009; Daniels & Piechowski, 2009; Fonseca, 2011), and a "sensitivity factor" among gifted individuals is widely accepted, at least from an anecdotal perspective (Edmunds & Edmunds, 2005, p. 69).

Sensory Sensitivity

Gifted individuals may be more sensitive to and more easily affected by environmental stimuli than others. Webb et al. (2005) note gifted individuals exhibit "extreme sensitivity to various kinds of sensory stimuli" (p. 151), Vaivre-Douret (2011) mentions "oversensitiveness" (p. 9) among the gifted, and, at a pathological level, sensory processing disorder is "suspected to be more common in highly or profoundly gifted children" (Eide & Eide, 2006, p. 304). While these are anecdotal accounts, empirical research findings are similar.

Researchers have examined various aspects of sensory discrimination and intellectual ability. For example, numerous studies have found a relationship between IQ and visual aesthetic sen-

sitivity (Chamorro-Premuzic & Furnham, 2004; Frois & Eysenck, 1995; Furnham & Chamorro-Premuzic, 2004; Myszkowski, Storme, Zenasni, & Lubart, 2014). Li, Jordanova, and Lindenberger (1998) found tactile discrimination accounted for about 20% of the variance in IQ among their sample. Helmbold, Troche, and Rammsayer (2006) found temporal discrimination and pitch discrimination accounted for about 24% of the variance in IQ among their sample. Danthiir, Roberts, Pallier, and Stankov (2000) even found a significant relationship between olfactory discrimination and IQ.

In a study that directly examined the sensory sensitivities of gifted children, Gere, Capps, Mitchell, and Grubbs (2009) gathered data on eighty 6- to 11-year-old gifted children (IQ ≥ 138). They found the gifted children were more sensitive to their environment than children of average intelligence and that the gifted children were more likely to react to environmental stimuli with heightened emotional and behavioral responses than children of average intelligence.

Dabrowski (1964) offered a theory of development that has been applied to the field of gifted education because of his focus on sensitivities. Dabrowski called the sensitivities "overexcitabilities," which are an innate tendency to respond to internal and external stimuli in an intensified manner (Piechowski, 1986). The word "overexcitability" is a translation of the Polish word "nadpodbudliwość," which means "superstimulatability." Overexcitabilities are just one component out of three in Dabrowski's (1967, 1972) notion of developmental potential, which refers to innate endowment that differs among individuals. The stronger the endowment, the greater the potential for advanced development. Dabrowksi's notion of developmental potential overlaps considerably with characteristics found in high ability individuals, most obviously because talents, specific abilities, and level of general intelligence constitute the first component of developmental potential. Another component is the capacity for self-determination and autonomy. Overexcitabilities, the final component, include five different forms: intellectual (striving for knowledge and truth through questioning, discovering, and analyzing), psychomotor (a surplus of energy), sensual (enhanced level of sensory experience), imaginational (daydreaming, fantasizing, dramatization, use of imagery), and emotional (intensified level of interpersonal relations to people, things, and places). The sensual overexcitability is the one of most interest here since it pertains to sensory processing.

Overexcitabilities have been found in gifted children (Tucker & Hafenstein, 1997), gifted adolescents (Gross, Rinn, & Jamieson, 2007; Limont, Dreszer-Drogorób, Bedyńska, Śliwińska, & Jastrzębska, 2014; Rinn, Mendaglio, Rudasill, & McQueen, 2010), and gifted adults (Wirthwein, Becker, Loehr, & Rost, 2011), and gifted individuals have been found to score higher on a measure of sensual overexcitability than non-gifted individuals (Van Den Broeck, Hofmans, Cooremans, & Staels, 2014). Carman (2011) found a moderate correlation ($r = 0.446$) between scores on a measure of overexcitabilities and a measure of sensory processing. These findings provide some evidence that sensory issues may be highly relevant in the high IQ population. Further, gifted children have been found to develop sensory skills earlier than typically expected (Vaivre-Douret, 2011), and physiological development and intellectual development interact and can develop asynchronously such that physiological mechanisms develop later than intellectual mechanisms (Silverman, 1997), potentially leading to a problem with interpreting or processing some forms of sensory input.

Emotional Intensity

Researchers have suggested gifted individuals may feel their emotions more intensely than other individuals (Piechowski, 1997; Piechowski & Cunningham, 1985), and Mendaglio (1995) notes, "gifted persons feel more because they see more than their non-gifted counterparts" (p. 169). Emotional intensity could be operationalized as any number of

different emotion related constructs, but it is most often conceptualized and measured as an emotional overexcitability in the study of gifted individuals. Dabrowski (1972) defines an individual with an emotional overexcitability as someone who "is sensitive, takes everything to heart, is syntonic and even more often empathetic though not necessarily in a highly developed manner. He has a need of exclusive and lasting relationships, of help and protection, of understanding suffering" (p. 7).

Some researchers have found gifted individuals to score higher than average-ability individuals on measures of emotional overexcitability. For example, Piechowski and Colangelo (1984) examined the overexcitabilities of gifted adolescents, intellectually gifted adults, artists, and average-ability graduate students. Gifted adolescents and gifted adults scored highest on measures of emotional, intellectual, and imaginational overexcitabilities. Similarly, Gallagher (1985) found gifted sixth grade students to report higher emotional, intellectual, and imaginational overexcitability scores than a sample of average-ability sixth grade students. These results replicate earlier studies (Lysy & Piechowski, 1983; Piechowski & Colangelo, 1984; Piechowski & Miller, 1995), wherein intellectual, emotional, and imaginational overexcitabilities were the overexcitabilities that differentiated gifted individuals from other individuals. Some findings vary with regard to which overexcitabilities are more prevalent in the gifted population, though. For example, a study of 10th and 11th grade students found gifted students to be characterized by higher emotional, intellectual, and psychomotor overexcitabilities than average-ability students (Ackerman, 1997), and Bouchet and Falk (2001) found gifted college students to scored higher than average-ability college students only on measures of intellectual and emotional overexcitabilities. What is common across all of these studies, though, is the finding that the emotional overexcitability scores are higher among the gifted samples than among the average-ability samples.

Social Development and Interpersonal Relationships

Research findings regarding the social development and interpersonal relationships of gifted children is largely inconsistent. In some research, gifted children have been found to be more at risk for problems related to social development and social skills than average-ability children (Freeman, 2006). Because of their advanced cognitive skills, gifted adolescents may have different approaches to forming and maintaining close friendships. Differences in aptitudes between gifted and average-ability students may present barriers for the development of positive peer relations. For example, in a study of 1465 gifted adolescents, ages 14–18, more than half reported they do not feel as if they can be themselves while at school (Cross, Coleman, & Stewart, 1993), and, in other studies, many admit to feeling different from peers (Coleman & Cross, 1988; Manor-Bullock, Look, & Dixon, 1995). Swiatek (2001) pointed out that many gifted adolescents see their advanced capabilities as a source of potential difficulties in social relationships.

Other researchers, however, have found no differences in social development between gifted and average-ability children (López & Sotillo, 2009), or even fewer social problems among gifted children than among average-ability children (Richards, Encel, & Shute, 2003). For example, Lee, Olszewski-Kubilius, and Thomson (2012) and Shechtman and Silektor (2012) both found gifted adolescents to rate themselves comparably to their average-ability peers with regard to a variety of measures of interpersonal competence and peer relationships. Further, in a study of 26 gifted children and 67 high-achieving children, Bain and Bell (2004) found that the gifted children had significantly higher self-concepts in the area of peer relations than the high-achieving children.

Numerous factors can impact the social development of gifted individuals. For example, families are very influential with regard to both the intellectual and social and emotional development of gifted children (Jolly & Matthews, 2012).

Most research examining parenting behavior and gifted children indicates gifted children tend to have positive relationships with their parents and that their parents tend to set limits, have reasonable expectations, and be warm and responsive (i.e., authoritative in nature; Dwairy, 2004; Rudasill, Adelson, Callahan, Houlihan, & Keizer, 2013). Family environments that are affectionate, supportive, and respectful likely impact the development of interpersonal skills and peer relationships among gifted individuals (Olszewski-Kubilius, Lee, & Thomson, 2014).

Another factor influencing the social development of gifted individuals includes access to like-minded peers. Most research indicates ability grouping fosters positive social outcomes for gifted individuals (see Vogl & Preckel, 2014). Gifted children and adolescents often gain access to like-minded peers through advanced course enrollment (e.g., acceleration, Advanced Placement, International Baccalaureate), thus fostering both their intellectual and social and emotional development (Park, Caine, & Wimmer, 2014). Adolescents taking advanced coursework have been found to have larger networks of friends and more engaged friends than equally able adolescents who were not enrolled in advanced coursework (Barber & Wasson, 2015). Summer enrichment programs also likely foster positive changes in social self-concept (Rinn, 2006).

Psychosocial Factors that Impact Talent Development

The discussion thus far has centered on social and emotional characteristics and experiences that may arise due to asynchronous development. In the following section, we examine psychosocial factors that affect the development of one's talents. Although numerous psychosocial factors may impact the talent development trajectory (see Olszewski-Kubilius, Subotnik, & Worrell, 2015b; Rinn, 2012), two of the most empirically examined, and perhaps among the most important, factors are discussed as follows.

Academic Self-Beliefs

Academic self-beliefs include such constructs as academic self-concept and academic self-efficacy, which are often used interchangeably by researchers (Pajares & Schunk, 2001). Academic self-efficacy, though, is a judgment of the confidence one has in one's academic abilities, while academic self-concept is a description of the beliefs, feelings, and assumptions one has about one's academic abilities. Regardless of the nuances in definitions, the importance of academic self-beliefs in the development of talent is clear: Academic self-beliefs, including academic self-concept and academic self-efficacy, have repeatedly been found to be related to numerous achievement related variables, including academic achievement and career aspirations (Dixson, Worrell, Olszewski-Kubilius, & Subotnik, 2016; Huang, 2011; Rinn, 2007).

Researchers have consistently observed that the academic self-concepts of gifted individuals are higher than those of their average-ability peers (Colangelo, Kelly, & Schrepfer, 1987; Hoge & Renzulli, 1993; Marsh, Chessor, Craven, & Roche, 1995; Rinn, 2007). Further, Hoge and Renzulli (1993), in their meta-analysis, found higher global self-concept scores among gifted students than non-gifted students.

Even among gifted individuals, though, variation in academic self-beliefs will exist. For example, some gifted individuals will be impacted by the Big-Fish–Little-Pond Effect, or the idea that when two students of the same ability or achievement level are put in different classrooms or programs, the one who is with the high ability or achievement group may have a lower academic self-concept in respective domains than the one with the less able group (Marsh, 1987; Marsh et al., 1995). However, recent research has revealed that characteristics of the individual, the nature of the program comparison, and the timing in life can all impact the resulting self-belief (Dai & Rinn, 2008; Dai, Rinn, & Tan, 2013).

Motivation/Internal Drive

Motivation is a construct that encompasses many of the traits that researchers in the field of gifted education believe are crucial for the development of talent (Renzulli, 1978; Rinn, 2012; Subotnik, Olszewski-Kubilius, & Worrell, 2011). Defining motivation is complicated, though, as evidenced by the numerous theories and perspectives of motivation that exist (e.g., attribution theory, Weiner, 1986; expectancy *x* value theory, Fishbein & Ajzen, 1975; Wigfield & Eccles, 2002; self-determination theory, Deci & Ryan, 2002). For example, expectancy *x* value theory suggests motivation is the result of believing a task is work doing (value) and having some expectation that the one could be successful at the task (expectations for success). Clinkenbeard (1996, 2012) notes research on motivation and gifted students can be classified into two categories, personal and environmental. Personal motivation relates to the characteristics that gifted learners possess, thus driving them to succeed. Environmental impact relates to programs and curriculum that have end goals the gifted learner would be motivated to attain.

Intrinsic and extrinsic motivation. Most in the field of gifted education would argue that the distinction between intrinsic motivation and extrinsic motivation is important (Rinn, 2012). Intrinsic motivation is internal and involves a drive to do something for its own sake (i.e., because the activity itself is rewarding), as compared with extrinsic motivation, which involves doing something to obtain something else (e.g., good grades, prestige; Woolfolk, 2009). Gifted individuals typically score higher on the intrinsic type of motivation than the extrinsic type (Clinkenbeard, 2012). For example, Olszewski-Kubilius, Kulieke, and Krasney (1988) reviewed a number of studies that showed gifted students score higher on measures of intrinsic motivation. Gottfried and Gottfried (1996) and Csikszentmihalyi, Rathunde, and Whalen (1993) both found that gifted students scored higher on measures of intrinsic motivation than average-ability students. However, gifted individuals can be both intrinsically and extrinsically motivated by the same activity (Feldhusen, Dai, & Clinkenbeard, 2000).

Environmental impact. A number of different environmental factors could impact personal motivation including curriculum and programming. Little (2012) discusses curriculum as motivation for gifted students, but notes that "exploring the curriculum itself as a motivating factor is somewhat akin to discussing the degree to which students have intrinsic motivation to engage with the curriculum" (p. 695). However, aspects of the curriculum that are motivating to students can be examined, such as challenge and personal value, or meaningfulness. Regarding challenge, many gifted students report a lack of challenge in their curriculums (see Little, 2012), but aspects of curriculum, such as an accelerated pace, limited repetition of content already mastered, and greater complexity and depth, all contribute to an appropriate level of challenge for gifted students. Teacher support can also have an impact with regard to a gifted students' experiences with challenging curriculum, particularly in cases where the personal value of the content may not be high.

Beliefs about the self. As previously discussed, academic self-beliefs are important with regard to their relationship with numerous achievement related variables, including academic achievement and career aspirations (Dixson et al., 2016; Huang, 2011; Rinn, 2007). These academic self-beliefs play a large role in motivation, such that believing you could be successful and feeling like you have the capabilities to persevere through challenging activities or set-backs will impact your level of success. Beliefs about the self play a prominent role in numerous theories of motivation, including the expectancy *x* value theory previously discussed (Wigfield & Eccles, 2002), as well as self-determination theory (Deci & Ryan, 2002), for example, such that feelings of competence play a central role in motivated behavior.

Mindset. Recent research on "mindset" is intertwined with the motivation research on gifted students, although not much research has been directly conducted on mindset and giftedness (Esparza, Shumow, & Schmidt, 2014).

Dweck (2006) introduced the term *growth mindset*, which is the idea that intelligence and abilities can be changed through effort and deliberate practice. In contrast to a growth mindset, others may have a *fixed mindset*, which is the belief that intelligence and abilities are fixed and cannot be changed. While many gifted students hold a growth mindset about their ability to increase their intelligence and domain-specific skills, many hold a more fixed view of their giftedness (Esparza et al., 2014; Makel, Snyder, Thomas, Malone, & Putallaz, 2015). Often, learners with a growth mindset have learning and development goals and exhibit mastery-oriented behavior, such as seeking out challenges and persisting through difficulties. Problems arise when gifted children and adolescents hold a fixed mindset or their growth mindset does not result in action. For example, those gifted individuals with a fixed mindset have been found to have higher levels of unhealthy perfectionism than gifted individuals with a growth mindset (Chan, 2012).

Mueller and Dweck (1998) note that when we label children as highly intelligent we move the reason for their success to something out of their control. Good performance would then equal higher intelligence and poor performance would equal low intelligence. When children are praised for being smart, they may take the belief that their intelligence, which is fixed or something out of their control, was the reason for their success. When faced with a challenging task and failure becomes imminent, the learner is faced with the realization that failure equals lack of intelligence. The learner would then decide to forgo the task, or become unmotivated, to save their highly intelligent label. Mueller and Dweck concluded that praising learners for their hard work did more to increase motivation because it led the learner to believe a factor they could control (e.g., how hard the learner works) was responsible for his or her success. When facing a challenging task, the learner would take on the belief that he or she can accomplish anything if he or she works hard enough. Failure in this case would not reflect one's intelligence, a trait gifted learners may highly value. Gifted learners aiming for success would then exhibit higher motivation in their work ethic to obtain their goals.

Summary

We can see that giving attention to both one's social and emotional development and to the development of one's psychosocial skills is an important component to the healthy functioning of individuals and the development of their gifts and talents. Asynchronous development can put the gifted individual onto a different development trajectory than average-ability individuals. Because of advanced intellectual development, unique social and emotional characteristics and experiences may arise, including perfectionism, sensitivity, intensity, and issues surrounding social relationships. These characteristics and experiences could potentially interfere with an individual's ability to pursue his or her talents. Also, a number of psychosocial skills, including strong self-beliefs and intrinsic motivation, must be present, nurtured, and developed in order for an individual to attain expertise or eminence in his or her domain of talent.

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Expertise and Individual Differences

5

Phillip L. Ackerman and Joni M. Lakin

Abstract

There are several types of expert knowledge, including factual (declarative), skills (procedural), and tacit knowledge. Expertise represents a high level of achievement in one or more of these domains. These types of knowledge are described, along with how they are acquired, and how they are maintained. The structure of cognitive individual-differences constructs of achievement, aptitude, and intelligence is also examined. Together with interests and motivation, investment of cognitive resources represents important determinants of both the level and domains of expertise that may be acquired. Strategies for identifying student potential for acquiring expertise are reviewed, along with the use of various types of assessments, and expectations for talent identification for medium-term and long-term predictions.

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What Is Expertise?

A quick reference to the Internet or popular media reveals myriad individuals who are considered (or consider themselves) "experts." Precise definitions of what constitutes expertise are somewhat elusive, which of course is why there are often rancorous disagreements about an individual's expertise, especially when controversial issues are discussed in a public forum. Nonetheless, there is general agreement about expertise in many, if not most, domains. Doctors, dentists, lawyers, psychologists, teachers, electricians, plumbers, accountants, and numerous other occupations have licensure or certification procedures that involve subject matter tests and other sources of evidence that are used to determine whether an individual has mastered the knowledge and skills required to practice the profession or craft. On this basis, we can state that an expert is someone who has mastered a particular set of domain knowledge or skills. However, it is important to note that expertise is domain-limited—an individual is not merely an "expert"—he or she is an expert in a particular area. That is, someone may be a top-notch plumber or neurosurgeon, but that person may have little or no knowledge or skill in auto repair, carpentry, or particle physics.

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Types of Knowledge

Ryle (1949/2000) described two major forms of knowledge, which are described as declarative knowledge (knowing that) and procedural knowledge (knowing how). Later investigators, such as Polanyi (1966/1983) described a third type of knowledge—knowing with—which is usually referred to as "tacit knowledge." This type of knowledge appears to be fundamentally different from the other forms of knowledge. In fact, Broudy (1977) has argued that tacit knowledge is perhaps more important to understanding much of what is learned in school, and that in turn, is used to solve novel problems in adulthood. Each of these types of knowledge is discussed in more detail below.

Declarative Knowledge. In essence, declarative knowledge is factual knowledge about the world, including things like history, biology, chemistry, astronomy, and art. It can be discrete, such as knowledge about things (such as the number of senators in Congress, the names of the Supreme Court Justices, prime numbers between 1 and 20) or events (such as when the first moon landing occurred). Declarative knowledge can also be a set of organized or principled knowledge, such as geometry theorems, the laws of classical physics or chemistry, or the rules for playing baseball and football. Adler (1974) categorized this type of knowledge into a wheel (see Fig. 5.1). As can be seen, the figure describes much of what is taught in school—ranging from science and technology to the humanities and formal types of knowledge, such as logic and math.

People also draw on declarative knowledge frequently in their day-to-day activities, whether it is knowing the names of friends and teachers, where to find a particular item on the grocery store shelf, or what one's PIN number is to make a purchase with a debit card. On one hand, in recent decades, in contrast to earlier times, people have found that they do not need to have some of this critical declarative knowledge memorized, because of the ready availability of computers, the Internet, and smartphones. Phone numbers or birthdays of friends are entered once into a smartphone, and then readily forgotten, but easily recalled with the assistance of technology. The physical address of a restaurant, and even when it opens or closes is information obtained with a quick search of the Internet. Formulas for calculating areas of a geometric shape, conversions from English to metric measurements, and other aspects of declarative knowledge have, to a great

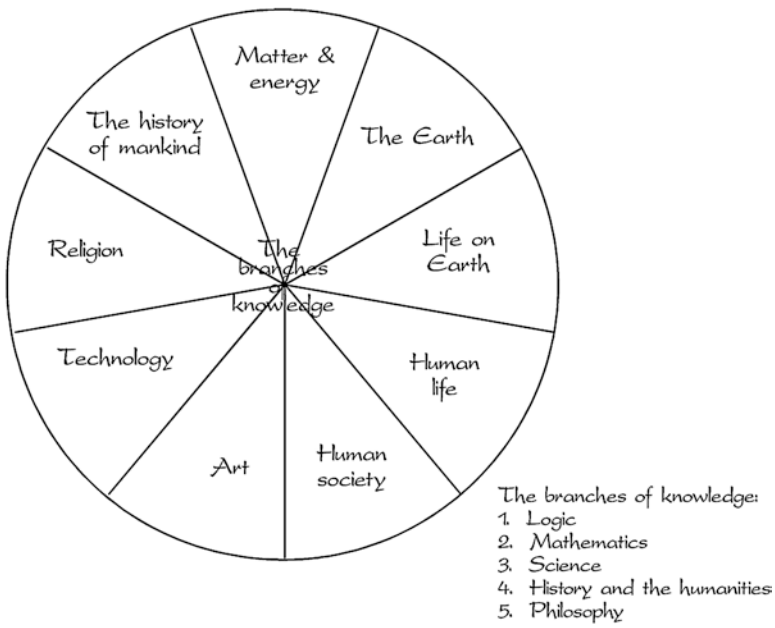

Fig. 5.1 The circle of learning. After Adler (1974)

degree, been off-loaded to technology in recent years, whether the technology is a sophisticated calculator with built-in functions, a phone, or some type of computer. On the other hand, the loss of a smartphone can make the user frantic, partly because of the accompanying inaccessibility of such declarative knowledge.

Declarative knowledge is perhaps the most straightforward to assess—it is mainly measured through direct factual questions. It can be assessed through tests of recall ("Who was the first president of the USA?) or recognition ("Whose portrait appears on the $20 bill? (a) Hamilton, (b) Jefferson, (c) Franklin, or (d) Jackson"). More complex assessments of declarative knowledge (primarily for research purposes) look for evidence of how the declarative knowledge is organized and grouped, where experts reveal specific patterns of recall and have greater working memory capacity in their field due to *chunking* (Gobet, 2005).

Procedural Knowledge. In contrast to declarative knowledge, procedural knowledge typically involves a sequence or sequences of actions, from very basic activities such as tying one's shoes, to highly complex activities, such as performing cardiac bypass surgery. In between these levels of complexity are physical skills such as riding a bicycle or driving a car. Typically, new procedural skills require two things: declarative knowledge early in skill acquisition, and extensive practice. When a student learns to read musical notation and play an instrument, there is a large amount of information that must be memorized, such as the associations between the musical note and tempo markings on the score and the placement of the hands or fingers on the instrument. At early stages of exposure, these associations are error-prone, and clearly are cognitively mediated (i.e., the learner effectively has an inner dialog that says something on the order of "this marking means that I have to move my fingers to a particular position"). With extensive practice, the associations between the symbols on the score and the physical actions of playing a note can become "proceduralized," such that the performer automatically (quickly and effortlessly) recognizes the information on the musical score and translates it to physical actions within a continuous display of the skill, or even may have learned the score entirely, so that it is not even needed for reference. Perhaps the most critical procedural skill that is taught and learned in school is that of reading. Early in the learning process, reading is effortful, requires sounding out letters, and decoding words, leaving few spare cognitive resources for comprehension. But, with extensive practice, learners develop "sight vocabularies" of frequently appearing words and automatic procedures for decoding unfamiliar words (e.g., see Frederiksen, Warren, & Rosebery, 1985). These procedural skills make many aspects of the task of reading essentially automatic, which in turn allows the reader to devote his or her attention to the comprehension of the text. Other procedural skills range from essential basic math tasks (e.g., addition, subtraction, multiplication, and division), to keyboard skills and skills in using computer software programs, such as word processors. Assessments of procedural knowledge generally require that the examinee demonstrate performance of the procedures directly, whether by administering skill tests (such as a math computation test) or other types of performance (e.g., a musical performance).

Tacit Knowledge. Tacit knowledge is usually *inferred*, rather than directly demonstrated. In fact, Broudy (1977) suggested that the educated individual "thinks, perceives, and judges with everything that he [or she] has studied in school, even though he [or she] cannot recall these learnings on demand" (Broudy, 1977, p. 12; see also Bransford & Schwartz, 2000, for a discussion of knowing with and transfer). That is, tacit knowledge is somewhat amorphous, but the presence of tacit knowledge is inferred through demonstrations of the differences between problem-solving effectiveness of individuals before and after exposure to the educational system or through contrasts between individuals who have completed an educational program and those who have not. In this sense, tacit knowledge is often not the result of direct instruction, but is an indirect benefit of a wide variety of learning and performance experiences. It has been referred to in other ways, such as "wisdom" (e.g., see Baltes,

Smith, & Staudinger, 1992), or more broadly as the "educated mind."

Acquisition of Knowledge. Each of the three types of knowledge appears to have a different means and pattern of acquisition. Although numerous investigators have sought shortcuts for knowledge and skill acquisition over the past decades (or even centuries), there appear to be no known methods of knowledge acquisition that are as effective as the traditional approaches. For declarative knowledge, memorization, and associations are usually the preferred approaches. Rote memorization through repetition and testing is one approach. Building new knowledge through associations, such as learning a foreign language by pairing known words in the learner's native language with words of similar meaning in the foreign language, is another approach. Beyond initial knowledge acquisition, it is possible to augment these approaches with more integrated and functional approaches, such as language learning through immersion. One central concept in the acquisition of declarative and procedural knowledge is that of "transfer." For knowledge that is not completely novel or disconnected from our domains of knowledge, learners use their preexisting domain knowledge as a foundation to building new knowledge. Many areas of inquiry actually *require* substantial domain knowledge, in order to develop further knowledge, but in other areas, having a rich set of domain knowledge means that the learner does not have to acquire new facts in isolation, but can integrate the new knowledge with existing knowledge. This type of knowledge acquisition is less demanding of cognitive attention; it also makes the new knowledge more resistant to forgetting, because it becomes part of a partially redundant repertoire of knowledge. For example, reading a newspaper or Internet news story about some current event in the world has very different demands on a reader for whom the content is novel (e.g., a foreign traveler) than it does for a reader who is familiar with the topic (e.g., a local). To "learn" the facts of a political story about a different country, for the uninformed individual, might require the memorization of names, political offices held, relations between various parties, current economic and political trends, and so on. The reader who is familiar with most of these issues and knowledgeable about the individuals mentioned in the story has a much easier task when committing the information to memory. This reader need only update his/her existing knowledge—something that may involve only committing one or a few updated facts to the declarative knowledge already memorized.

Acquisition of procedural knowledge is often more complicated than declarative knowledge, because whole-task practice is too difficult for new learners, and it is typically unclear exactly which decomposition approach for part-task training is most effective. An everyday example is the challenge of learning to drive a manual transmission automobile where the many demands on the driver's attention are overwhelming early on. Numerous approaches exist for teaching students how to play a musical instrument, for example, ranging from those that start with musical appreciation and those that begin with learning basic fingering techniques and simple melodies. Nonetheless, for many procedural skills, initial instruction depends on the learner acquiring declarative knowledge (e.g., learning how to read musical notation), with later transitions to extensive practice on various components of the skills to be acquired. Learning how to perform a medical procedure as a doctor, for example, entails numerous hours of classroom learning (declarative knowledge) prior to hands-on procedural practice. Ultimately, expert performance on procedural tasks requires extensive practice, usually over long periods of time. In addition, much of the procedural knowledge repertoire is considered to be relatively "brittle" (Ohlsson, 1993). Knowledge transfer of the kind described regarding declarative knowledge is much more limited for procedural knowledge. Some consistent strategies and procedures may show transfer benefits (e.g., such as transitioning from playing a soprano saxophone to a tenor saxophone), but beyond surface-level similarities, transfer is relatively ineffective (e.g., such as transitioning from playing a saxophone to playing a piano or a trumpet).

Very little is known about the best methods for acquiring tacit knowledge. Because it is difficult, if not impossible to directly assess tacit knowledge except in very narrow domains, it is not feasible to determine whether a particular educational or instructional approach is more or less effective at developing tacit knowledge than some other approach. But, from a conceptual point of view, the most important influences of tacit knowledge are found in transfer of prior learning to novel task performance. Reasoning by analogy and critical thinking skills represent the kinds of higher-order tacit knowledge that appear to make some educated individuals generally more adept than others at novel problem-solving. Another approach to assessment is performance assessments, where authentic tasks are performed. Although these assessments are not always able to diagnose the source of difficulty (declarative, procedural, or tacit knowledge) these tasks are able to tap into all levels of expert knowledge in performance of complex tasks.

Maintenance of Knowledge

The general consensus from the empirical literature is that procedural knowledge is surprisingly robust, once acquired to a reasonably high level of expertise. Much like the colloquial idea of skill at riding a bicycle, although one may be a bit unsteady after a prolonged period of lack of practice/performance, the skill is often rapidly reacquired with new practice. A notable example can be found from an examination of retention/relearning of typewriting skill by Hill (Hill, 1934, 1957; Hill, Rejall, & Thorndike, 1913). Hill acquired typewriting skills over a period of 5 months, and after very little exposure to typing over the next 25 years, he attempted typewriting again. It took him about 1/6 the time to reacquire the skill than it had taken him to acquire the original procedural knowledge. After another 25 year delay without much exposure to typing, Hill reacquired typewriting skills (at age 80!), with a notable increase in speed of acquisition, in comparison to the original learning, 50 years prior to the final practice.

Declarative knowledge, if not used frequently, appears to be less robust than procedural knowledge. For example, although students who performed well in acquiring foreign language skills also performed reasonably well on retention after 35 years (Bahrick, 1984; Bahrick & Hall, 1991), students who did not acquire the same level of expertise in original learning were also at a distinct disadvantage at later recall. Overall, declarative knowledge that is used frequently is expected to be better retained than knowledge that is infrequently recalled.

The permanence of tacit knowledge is yet to be mapped out, given the difficulty in assessing it in any kind of comprehensive fashion.

In general, it appears that knowledge, once acquired, is relatively resistant to degradation over extended periods of time, and is more robust if: (a) the knowledge is acquired to a high level of expertise, and (b) if the knowledge is engaged during the interim. Individual differences in both of these conditions appear to be key influences in determining who will be most likely to retain expertise over long periods of time.

Achievement, Aptitude, and Intelligence

Various constructs have been developed to describe the cognitive capabilities of students, over the course of modern psychology. Prominent among these constructs are intelligence, aptitude, and achievement. Achievement is a construct that is most straightforward. It typically refers to the degree to which an individual has mastered a body of knowledge or a set of skills. Achievement in the math domain might describe specific declarative knowledge or procedural skills, such as basic computations, algebra, geometry theorems, and calculus. Achievement in history typically refers to declarative knowledge, such as factual information about significant names and dates in the past. Achievement can also strictly refer to a set of procedural skills, such as mastery of a musical instrument, drawing, operating a complex machine, or similar kinds of activities.

Defining "aptitude" is somewhat more difficult than defining achievement. Historically, aptitude refers to *potential*. A student with math aptitude or verbal aptitude is considered as someone who has the potential to acquire knowledge and skills in math or verbal domains, respectively. From a pragmatic perspective, aptitude measures tend to be more general in content than achievement tests, in that aptitude measures are not *directly* tied to a particular course of instruction. The utility of aptitude measures lies in their predictive power for future achievement assessments. That is, aptitudes are considered to anticipate or predict mastery after instruction or practice. But, from a theoretical perspective, the construct of aptitude as potential requires specification of the conditions that make achievement possible. To the degree that optimal instruction or practice regimes (or other kinds of educational interventions) are yet unknown, it is impossible to specify whether a lack of later achievement is more or less a function of the individual's aptitude or either a function of the efficacy of the instructional treatment, or perhaps the individual's willingness or interest in acquiring the knowledge or skills under consideration. Moreover, an individual's performance on any cognitive assessment is a reflection of what has been learned to date—that is, the individual's current performance. Thus, "aptitude" is somewhat of a misnomer. One does not directly assess aptitude with an aptitude test; rather what is being assessed is a less diffuse estimate of achievement, albeit with a concentration on material that is not the direct result of specific instruction or practice. In addition, whether a test is classified as an achievement or aptitude test may lie, not entirely on the nature of the test content, but in the recency of the underlying instruction that the student is exposed to and the intended uses of the scores. A test of algebra or geometry administered to a 9th or 10th grade student may be considered to be an achievement test. But the same content administered in 12th grade (on the SAT or ACT) or at the conclusion of college/university study (e.g., on the Graduate Records Examination) is considered as an aptitude assessment.

In contrast to achievement and aptitude constructs, there are myriad definitions of the construct of intelligence. These range from conceptualizations that intelligence is something like "mental power" (Spearman, 1927) to definitions that are more prosaic, such as the ability to do "abstract reasoning" (Terman, 1921), or as E.G. Boring (1923) famously wrote "Intelligence is what the [intelligence] tests test." In fact, Boring went on to more articulately describe what he meant by the somewhat trite statement: "*If we agree, then, to define intelligence as what the tests of intelligence test, there is a good deal that we can say about it. We can say everything that has been experimentally observed. We can say that it is a "common factor" in many abilities, that it is something like power, that it can be measured roughly although not very finely, that it is only one factor among many in the mental life*. …," (p. 35).

The description provided by Boring is a good start, but more needs to be said about the construct of intelligence, with reference to assessment and the meaning of intelligence scores. First, as pointed out by various investigators (e.g., Anastasi, 1983), a fundamental assumption of intelligence assessments is that they are only valid indicators when an examinee has had adequate exposure to the test material in the examination. A child who, for example, has not acquired skill in the language of the test will be at a distinct disadvantage when compared to a child who is a native speaker of the test language. Second, as with aptitude tests, all that an intelligence test can provide is an assessment of current behavioral functioning—that is, there is no such thing as a measure of intellectual "capacity." Third, modern intelligence tests draw their validity partly from the assumption that the child his trying his/her utmost to perform well on the test (e.g., see discussion by Ackerman, 1996). A child who does not exert maximal effort on an intelligence test, whether through lack of motivation, distraction, or lack of rapport with the examiner, will have test scores that may not be meaningful and may not provide valid predictions of future performance. From a pragmatic perspective, one can think of an intelligence test as a broad sample of knowledge, skills, and abilities along the lines described by Boring, that can be used for predicting academic success or failure. Some extensive

intelligence tests also provide *diagnostic* information about particular types of learning disabilities, that can be used for educational interventions or other types of remediation.

Fluid and Crystallized Intelligence. From a developmental or educational perspective, it is useful to distinguish between two separate, but related major groups of abilities, associated with the theory of intelligence proposed by Cattell (1943). Fluid intellectual abilities are conceptualized as more process-oriented abilities—they underlie abilities associated with abstract reasoning, short-term and working memory, and overall, the ability to solve novel problems. Although these aspects of intelligence develop in concert with maturation and education, they are thought to have less direct dependence on specific courses of instruction or experience. In contrast, crystallized intelligence is conceptualized as directly related to education and experience—it includes a wide array of declarative and procedural knowledge (e.g., vocabulary, topical knowledge in the sciences, arts, and humanities, along with skills to play a musical instrument, program a computer, and pilot an airplane), and it also includes other domains of academic, occupational, and avocational knowledge (e.g., hobbies). Even though these types of intellectual abilities are moderately to substantially correlated in child and adolescent aged groups, crystallized intelligence is associated mostly with expertise, and fluid intelligence is associated with other aspects of intellectual performance.

Ultimately, achievement, aptitude, and intelligence tests provide overlapping information, where achievement tests are typically the narrowest sampling of knowledge and skills, intelligence assessments typically represent the broadest sampling, and aptitude assessments fall in-between achievement and intelligence tests in terms of breadth of content. The value of these different assessments lies mostly in their respective applications. Intelligence tests are mostly used for prediction of future overall academic success, aptitude measures are used for prediction of narrower criteria (e.g., success in math or verbal academic domains) or differentiation, in terms of recommending future educational or occupational opportunities, based on an individual's pattern of strengths and weaknesses. Achievement tests are used mostly for assessment of learning outcomes, but can also be used to predict future success in relatively narrow domains.

With respect to expertise, each of these types of assessments involves some combination of declarative, procedural, and tacit knowledge. Achievement tests can be entirely made up of assessments of either declarative or procedural knowledge, depending on the domain. Aptitude tests and intelligence tests may tap each type of knowledge, but such tests tend to draw less on procedural knowledge and more on declarative knowledge. Intelligence tests may draw on tacit knowledge too, depending on the degree of novelty of problem-solving required in the particular selection of tasks that are presented to the examinee. For example, in an insight problem-solving task, the examinee may not have received any direct instruction on the particular problem, but instead he or she must draw from general problem-solving skills or reason by analogy from similar tasks that have been previously learned. Such requirements would likely fall at least partly in the domain of tacit knowledge (for an example, see Wertheimer, 1959, on solving the problem of finding the area of a parallelogram).

Intellectual Investment

Aside from developed abilities, the most central element in the acquisition of expertise in the investment of cognitive effort over time, whether it is associated with memorization of declarative knowledge, practice and skill development for procedural knowledge, or acquisition and retention of tacit knowledge through intellectual engagement in and out of school. Cattell (1971/1987) suggested that it is this "investment" of cognitive effort that ultimately leads to development of crystallized intelligence. Individuals may be more or less disposed to investing cognitive effort over time—so *level* of investment is a key indicator of knowledge acquisition. In addition, individuals differ in the *direction* of intellectual investment. Time and effort are essentially limited, so even if an individual chooses to devote considerable

cognitive resources to knowledge acquisition, he or she must choose whether to devote most attention to a single domain or a small number of domains (i.e., depth of knowledge), or spread the cognitive effort toward knowledge acquisition toward many different domains (i.e., breadth of knowledge). Learners with higher abilities, all else being equal, will have to devote less effort than learners with lower abilities to achieve the same level of expertise. But individuals with lower or average abilities may be able to achieve levels of expertise equal to those of higher abilities, by expending more time and effort overall, or by investing a greater portion of their intellectual effort toward a smaller number of domains in which they acquire knowledge.

Non-ability Traits: Motivation, Interests, and Self-Concept

The direction and proportional level of an individual's effort devoted to a task, not just the acquisition of knowledge, is determined mainly by the level of that individual's motivation (e.g., see Kanfer, 1987). Motivation takes several forms, starting with an individual's decision to engage a task to begin with, and decisions to continue to expend effort, even when encountering failure or difficulties in improving performance. Individuals have relatively stable traits of motivation, such as an orientation toward mastery, or an orientation toward worry in evaluation contexts. Levels of motivation may also be affected by external factors (e.g., goal setting, social influence, competition, and other valued outcomes) or intrinsic factors (e.g., feelings of mastery, an overall desire to learn, or enjoyment of the task itself). In addition to motivational trait differences, individuals differ in interests that also affect their degree of engagement in various tasks. Holland (1959) and others have generally converged on a model of interests that includes six major themes, described as Realistic (e.g., mechanical and motor skills), Investigative (e.g., science, engineering), Artistic (e.g., music, arts), Social (e.g., counseling, training), Enterprising (e.g., sales, marketing), and Conventional (e.g., business, finance, technical support). Interests are thought to have appetitive (approach) and avoidance influences on the learner. When the knowledge and skills to be acquired fall within the themes that are most aligned with the learner's interests, again if other things are equal, the learner is expected to expend greater effort toward the task of acquiring the knowledge and skills. When the knowledge and skills are associated more with themes where the individual has low levels of interest, then the learner may be less likely to devote time and effort toward knowledge acquisition.

Self-concept also plays an important role in acquisition of knowledge, especially in the early phases of learning. An individual's belief in his or her own capabilities, which are often only loosely aligned with actual (or objectively assessed) abilities (e.g., Ackerman & Wolman, 2007), appears to be an important determinant of initial engagement in a learning activity, and the degree of persistence in learning over extended periods of time. A student with low self-concept for a particular domain then is more likely to avoid tasks where he or she expects to fail or otherwise struggle to succeed, while a student with high self-concept is more likely to engage the task and persist, even when experiencing difficulties in knowledge and skill acquisition.

Non-ability Traits: Personality

In addition to motivational and self-concept influences, individual differences in personality traits also appear to play a role in determining individual differences in the acquisition of expertise. Although most empirical studies of personality correlates of domain knowledge are conducted with older adolescents and adults (partly because personality traits are traditionally considered as not entirely fully developed in children), existing evidence suggests that personality traits of conscientiousness and openness to experience (also known as "intellectance") are positively associated with both academic success and domain knowledge, especially in academic areas (e.g., for

a review, see Poropat, 2009). Other personality traits, such as neuroticism, appear to be negatively associated with the same criterion variables.

Abilities (aptitude, intelligence), motivation (motivational traits, interests), self-concept, and key personality traits are also related to one another. Although some of the correlations are modest in magnitude, it appears that constellations of traits, called "trait complexes" operate in either a facilitative or impeding fashion in the development of domain knowledge and expertise. An Intellectual/Cultural trait complex, which consists of verbal intellectual abilities, artistic and investigative interest themes, verbal self-concept, and openness/intellectual personality traits are positively associated with adolescent and adult individual differences in domain knowledge in a variety of areas (e.g., literature, arts, and humanities). Similarly, a Science/Math trait complex, which consists of spatial and quantitative abilities, math and science self-concept, and both realistic and investigative interest themes, is associated with domain knowledge in a variety of science and math domains. Other trait complexes (e.g., Conventional and Social), are often negatively associated with domain knowledge in academic areas (e.g., see Ackerman, Bowen, Beier, & Kanfer, 2001). Together, these findings suggest that prediction of which learners develop expertise in particular areas may be accomplished by considering the whole-person, that is, consisting of a wide variety of cognitive (aptitude, intellectual), affective (personality), and conative (motivation) characteristics, rather than considering each type of individual differences in isolation.

School as Knowledge Acquisition and Aptitude Development

One of the major purposes, if not *the* major purpose of the educational system, is to impart declarative knowledge and procedural skills to students. Everything from the classic reading, writing, and arithmetic to science, history, language, the arts, and so on are subsumed in this framework. As noted earlier, less clear, but perhaps equally important, is the acquisition of tacit knowledge, which constitutes the critical thinking skills and general orientation toward purposive and intelligent problem-solving that is valued by society. For children, the traditional focus is on development of "core" knowledge and skills—that is, the corpus of knowledge that every educated child is expected to have. As children transition from elementary school to middle school and beyond, core content is an important component of the curriculum, but elective courses are often available, allowing different children to acquire knowledge and skills in more specialized areas of interest. By the end of high school, many students may have enrolled in numerous elective courses, ranging from different foreign languages to sciences, arts, humanities, and technology, and they may have completed additional advanced courses in core curriculum areas (such as in math). Although there is no inherent reason why one could not refer to knowledge of the core curriculum as a form of *expertise*, normally it is the elective courses that are associated with domains of differential expertise.

In addition to transmitting knowledge, which in essence reflects development of crystallized intellectual abilities, the educational system can play an important role in aptitude development. Experts differ on the degree to which aptitudes are malleable within the standard educational model, but cumulatively, the empirical evidence supports the notion that numerous educational programs are beneficial, not just for the direct knowledge imparted, but also for aptitude development across various domains (for a review, see Snow, 1996). To the degree that aptitudes represent the fundamental building blocks for future knowledge and skill acquisition, the effects of school can be considered to be both knowledge, and the aptitude to gain additional knowledge. Ultimately, education up through the secondary school system, can provide the basis for students to gain core knowledge, set them on their way to developing expertise in one or more specialized areas, and to develop both tacit knowledge and the skills to acquire expert levels of knowledge throughout their lives as adults.

Students enter the school system with myriad individual differences, along the lines discussed earlier (i.e., cognitive, affective, conative). Some of these differences are robust, for example, within the normal range of performance, rank order in general intellectual abilities tends to be stable from around first grade through high school (e.g., see Deary, Whalley, Lemmon, Crawford, & Starr, 2000). The other sources of individual differences are may be more malleable, but are not as tractable, given the fact that it is difficult to reliability measure these traits (e.g., interests, self-concept) until adolescence. Development of expertise in various topical domains is dependent to a greater or lesser degree on these traits, but also depends on the availability of instructional support for domains, especially in secondary school and beyond.

Identifying Expertise Potential

Much has been written on assessments for the purpose of identifying students who will benefit from gifted and talented educational programs (e.g., Pfeiffer, 2012; Renzulli & Reis, 2004). Part of the variety of research arises because gifted and talented educational programs in the US vary greatly in the purpose and intended outcomes of their programs. Relatively few K-12 school-based programs truly have the goal of helping students develop expertise, where expertise is defined as highly developed procedural and tacit skills in a narrow area of concentration (sometimes limited to the top 1% of ability or even rarer). Generally, even college-level programs do not have this goal, leaving such specialization for graduate school or the workplace, although in some cases students can attend earlier specialized programs.

Selecting an assessment approach requires understanding exactly what outcome is of interest. Some questions that can be answered include the following: (1) Who will need differentiated instruction? (2) Who will show high achievement later? and (3) Who will pursue exceptional levels of skill and become an expert? Most school programs are interested in the first question, which identifies students with current achievement levels that are well above their peers or the potential to learn at a rate much faster than their peers. These students require modifications to regular classroom instruction. The second question differs from the first in that it does not concern instruction and may look further into the future for outcomes of interest. Question three extends this question into a long-term question of which students will persist in their training well beyond other students. Few schools or programs are concerned with this last question because eminent talent is by definition rare.

Assessing Ability or Intelligence or Both?

It is common to place an emphasis on measures of ability or intelligence in identifying students with advanced academic needs or promise for future expertise. However, what many stakeholders do not realize is that, at least in the short-term, the best predictor of future accomplishment is past accomplishment. In other words, when predicting achievement 2–3 years out, the strongest predictor is often a related achievement measure, with ability measures in a related symbol system as a somewhat weaker predictor. Previous research has confirmed this relationship for K-12 achievement using ability scores (Lakin, 2012) as well as freshman grade point average (GPA) using SAT scores (Camara & Echternacht, 2000). One reason that current achievement is not ideal for identifying potential is that it depends greatly on the amount and quality of opportunities a student has had to develop those skills. In contexts where that opportunity varies significantly, that opportunity will be a greater influence on accomplishment than ability or other influences. This substantially reduces the validity of interpretations of high achievement as evidence of high potential and also impacts ability scores to a lesser degree. As a result, a few testing programs have begun to introduce scoring systems and test norms that control for opportunity to learn (OTL)

including the subgroup norms offered by the WISC-IV (Weiss, Saklofske, Prifitera, & Holdnack, 2006; see also Lohman, 2005).

The assessments most commonly used in K-12 schools to identify potential for high achievement are often referred to as "ability" tests, but may be interpreted similarly to intelligence test scores. The primary difference is that ability tests focus on tasks that primarily require abstract problem-solving. This is just one construct (albeit a central one) within the hierarchy defining general intelligence (Carroll, 1993). Intelligence tests, particularly individually administered tests, are more likely to include additional types of cognitive skills such as working memory and perceptual speed. These broader measures are better representations of the full hierarchy of skills. However, the tasks in these other non-reasoning domains are less closely tied to high levels of academic performance and are much more useful for identifying learning difficulties.

Among ability tests used commonly in schools, there is a distinction between multidimensional and unidimensional measures. Commonly used unidimensional assessments, such as Raven's Progressive Matrices (Raven, Court, & Raven, 1977), have just one item format and symbol system (abstract figural representations). Multidimensional ability tests most often incorporate Verbal, Quantitative, and Figural symbol systems (e.g., Beauducel & Kersting, 2002). These three symbol systems capture the vast majority of what is learned in typical K-12 schools and aligns well with Carroll's three reasoning factors: (a) *sequential or deductive reasoning*—verbal, logical, or deductive reasoning; (b) *quantitative reasoning*—inductive or deductive reasoning with quantitative concepts; and (c) *inductive reasoning*—typically measured with figural tasks.

These three reasoning domains (especially verbal and quantitative) align fairly closely with the symbol systems used in K-12 education. One area of reasoning that has not been studied sufficiently is reasoning about 3D or spatial relationships. A common misconception is that figural reasoning maps directly onto spatial tasks. However, figural tasks in common ability tests are almost exclusively two-dimensional figures and emphasize decontextualized reasoning about shapes, colors, and patterns and do not tap into the key spatial skills of visualization, transformation, or, particularly, mental rotation.

It should be noted that the interest in spatial reasoning is primarily driven by the current focus on science, technology, engineering, and mathematics (STEM) fields in the USA and globally. Other areas of expertise are less frequently discussed, but are similarly important to society. These other reasoning skills that might warrant similar concern include the ability to form complex written arguments, like those used in legal professions, and the evidence-based decision making required in medicine and many other fields. Neither of these complex skills is reflected in any omnibus intelligence test, because they represent complex, multidimensional skills that are difficult to directly measure.

Multidimensional ability tests offer more flexibility in terms of predicting achievement. The most effective measures of general reasoning skills derive their scores by averaging across symbol systems and content areas (i.e., multidimensional ability batteries), which also allows reporting of total and battery-level scores. Research has consistently shown that alignment of the predictors to the outcomes maximizes our efficiency in identifying which students will show the strongest performance at a later time. If a program wants to identify the students who will have the strongest language skills, it is more beneficial to measure verbal reasoning skills than general reasoning skills. A useful way of thinking of this alignment is described by Wittmann and Süß (1999) in terms of Brunswik Symmetry. Brunswik symmetry (as depicted in Fig. 5.2) serves as a reminder that as scores are averaged across domains (e.g., general achievement is an average of all achievement domains tested) broader constructs are assessed, which need to be predicted by broadly measured inputs or criteria that sample content at a similar broad level. If one is interested in identifying students who might be successful in any field, these general reasoning skills from multidimensional or

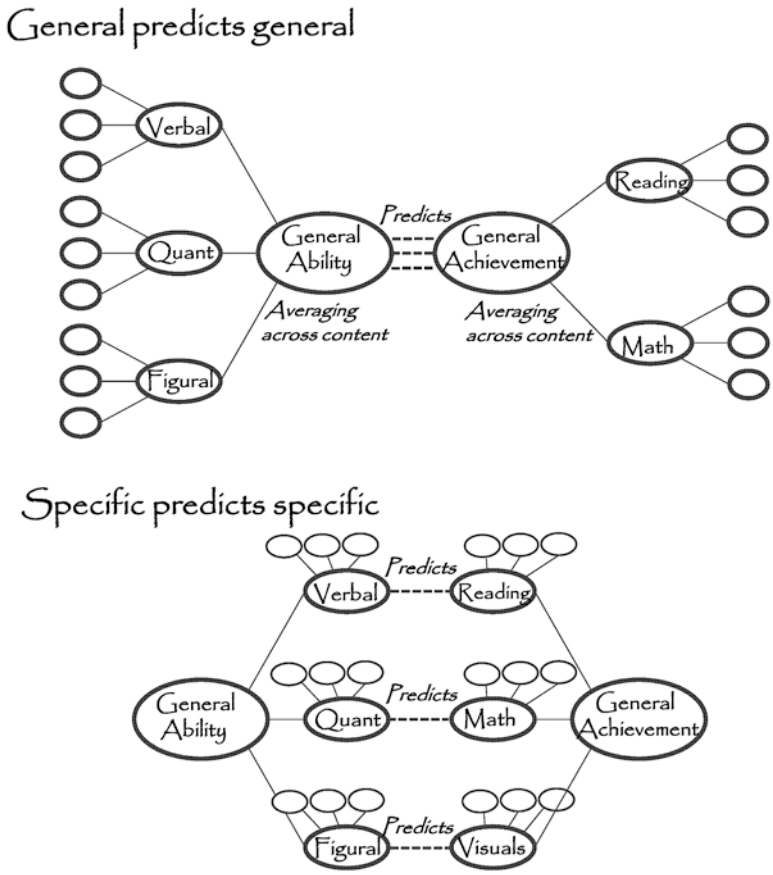

Fig. 5.2 Brunswik symmetry determines optimal predictive validity based on level of specificity for predictor and criterion space

unidimensional tests will be sufficient. But whenever a program or researcher is interested in predicting which students will show the most success in a specific field (English Language, Arts, Mathematics, etc.), research has consistently shown that alignment of the predictors to the outcomes maximizes efficiency in identifying which students will show the strongest performance at a later time.

Non-cognitive Components of Potential

Galton (1869/2000) proposed that eminence was a function of three influences: ability, zeal (passion for a subject), and capacity for hard work. Although each of these concepts has been developed into sophisticated areas of study, this original conceptualization is useful for thinking about how we might predict the development of expertise. These three components also have sound empirical support (e.g., Ackerman & Beier, 2003). Importantly, research has shown that ability is an important determinant, but not the *only* determinant of high levels of accomplishment.

Effort

From studying eminent scientists, artists, and other experts, research has yielded evidence that the ability to focus on a task for extended periods is key for transforming ability and interest into expert performance (Simonton, 2014). It is unclear whether or how this orientation or capability for work can be assessed. Lubinski, Benbow, and Kell (2014) studied differences in

survey questions about the number of hours worked and preference for work in their longitudinal study of gifted youth, and found group differences in willingness to work long hours, but they did not compare their findings to non-selected adults and these questions are unlikely be useful as predictors of eminence.

von Stumm, Hell, and Chamorro-Premuzic (2011) focused on measures of intellectual curiosity in predicting academic achievement. They found in their meta-analysis that conscientiousness (which they equate roughly with goal-focused effort) and typical intellectual engagement were moderately ($b = 0.2$) predictive of academic achievement, in models controlling for general intelligence. This is an important result confirming the role of effort in achievement above and beyond intelligence, which Galton noted. Note that von Stumm et al. did not restrict their study to eminence, but rather common variability in academic performance.

Interest

Typical effort and general intelligence may be predictors of accomplishment in general, but predicting the *area* of accomplishment is more difficult. Level of interest, related to Galton's concept of "zeal," may help predict the area of expertise that is developed. Measuring vocational interests is one avenue for predicting accomplishment, although these measures are not necessarily ideal for identification/placement purposes in schools because they are vulnerable to coaching effects.

Research has supported the role of interest in predicting areas of accomplishment. Research has shown that holding theoretical vs. aesthetic interests predicted college major 10 years later (Achter, Lubinski, Benbow, & Eftekhari-Sanjani, 1999) and career field 20 years later (Wai, Lubinski, & Benbow, 2005) above and beyond ability measures (Lubinski, 2016). It is more likely that interest inventories will be more effective at predicting the direction of expertise development rather than predicting the choice to pursue expertise or not.

Predicting Medium- and Long-Term Outcomes

Much of the prior review has focused on predicting short- and medium-term educational outcomes among students with a typical range of ability. The third focus of assessment—predicting students who will reach eminence—also has interest for many in the field. The greatest source of information about the prediction of potential for high level expertise comes from longitudinal studies of exceptional youth. Terman's original study (Terman, 1926) required extensive individual testing procedures with the Stanford-Binet and similar assessments. Stanley created the modern talent search when he introduced the use of out-level testing to gifted identification by administering the SAT (a college admissions test) to seventh and eighth grade students (Lubinski, 2016). The practice of using SAT and ACT batteries with students no older than eighth grade is now standard across the USA in several different talent search programs (Olszewski-Kubilius, 2015).

The use of out-of-level group testing greatly improved the efficiency of screening students for potential talent. This is key because identifying exceptional talent requires beginning with a large number of students (because of the low base rate of exceptional talent) and having an assessment that can show variability among high-performing students who would cluster around the 99th percentile using an on-level assessment (Warne, 2014). However, because of this standard, the evidence for predicting future potential is mostly limited to the predictive strength of verbal and quantitative reasoning. Only the Project TALENT longitudinal study (Flanagan, 1964) also included a measure of spatial and mechanical reasoning skills.

An important issue in predicting expertise outcomes is the need to define appropriate criteria for identifying later expertise, which is a nontrivial challenge for researchers (Lubinski et al., 2014). In typical K-12 classrooms, achievement tests are often used to identify students who have gained the intended knowledge and skills for a particular grade level. However, many schools

focus almost exclusively on reading and mathematics achievement, which is a much narrower focus than most educators and researchers are interested in when they consider the development of students toward expertise in their future career. Efforts to develop measures of adult expertise have been limited in scope because of the difficulty developing assessments for each of the many areas of expertise developed by adults.

For longitudinal studies of eminence, researchers needed to define the criterion as something unusual enough to represent truly expert performance (and not simply engagement in a particular career field). These criteria have included patents, academic positions, and publications (Lubinski, 2016). In limiting expertise to rare accomplishments, however, the challenges to assessment for predicting expertise is greatly increased. For instance, it increases the challenge to researchers due to the need to start with large numbers of students arises when unlikely and distal outcomes are used as criteria.

Conclusions

Expertise can take many forms—declarative knowledge, procedural skills, and/or a repertoire of tacit knowledge and skills. Typically, expertise is acquired through extensive exposure to a body of factual information, practice in increasingly complex and demanding tasks, or an extended engagement in cognitively demanding activities that involve reasoning and problem-solving, respectively. Individuals differ in their aptitudes for developing expertise in particular domains (such as for tasks that demand math, verbal, spatial, perceptual, and other abilities) and they also differ in their orientation toward or away from engagement in particular domains (e.g., interests, motivation). External forces (e.g., availability of school or other training/instructional programs) also influence the opportunities for individuals to maximize the combination of their aptitudes and interests.

Early school experiences traditionally focus on building core knowledge and skills (including tacit knowledge) that most students are expected to develop. Once students reach secondary school, they are often offered the opportunity to explore more specific courses of study that, in turn, lead to the beginnings of expertise in particular fields (e.g., languages, social and physical sciences, humanities). Identifying the optimal matching of student aptitudes and motivation/personality/interests to particular courses of study is an ongoing challenge for psychologists and measurement specialists. The challenge is partly due to the need to identify the constellations of individual traits that match both satisfaction and success in particular courses of study. The challenge is also partly due to the fact that adolescents may not have a fully formed sense of their own interests, because of a lack of prior exposure to various domains, or they may have multiple interests that they find it difficult to choose among them.

Research and applications from the development of expertise in sports may provide a useful approach for identifying potential for expertise development in academic domains. Just as Terman found it essentially impossible to identify Nobel Laureates from intelligence tests administered to children, it is not possible to identify Olympic gold medalists from physical ability measures administered to very young athletes. However, some sports programs have found it effective to use a successive-hurdles approach to identifying which sport an individual should ultimately attempt to develop to levels of expert performance (for a discussion, see Ackerman, 2014). That is, young children are exposed to several different kinds of sports, with a goal of determining for which sport a child is most adept at developing rudimentary skills, and which sport holds the highest level of interest for the child (e.g., tennis, gymnastics, ballet, and running). After this stage, the number of sports the individual continues to pursue is reduced further to concentrate on those that match the individual's aptitude/interests (e.g., gymnastics and ballet). Based on the individual's success at a second level of exposure/training, the domain is refined further, until ultimately the individual concentrates on a single sport, or a family of related sports. To translate this approach into domains of

academic expertise, the initial screening would consist of broad aptitudes and interests leading to increased exposure to broad topics (e.g., physical sciences, social sciences, and humanities). Based on levels of success after the early exposure to these topics, measures of both aptitudes/interests *and* achievement may then be used for further refinement of more advanced topics to pursue in later education. This overarching strategy leverages the increasing accuracy of prediction that occurs with combining ability and achievement measures, and with the increased reliability and validity of measures of motivation and interests.

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Creativity

6

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Abstract

Creativity has been identified by many as an important indicator of giftedness. In this chapter, we provide an introduction to the field of creativity. The chapter begins with a definition of creativity, followed by classic theories that reflect the history of creativity research. We then review and critique creativity assessments, an area of the field that has seen much recent activity. This critique is structured around the traditional framework of the 4P model, namely, person, product, process, and press (or context). The next section discusses pedagogical techniques and implications for fostering creativity. Finally, reflections are made to offer perspectives on future directions, with a few thoughts on globalization, collaboration, replication, and equity.

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Introduction

With the world becoming increasingly complicated and complex, the fostering of creativity is more important than ever before. Creativity is often conceptualized as an engine of economic development as well as the impetus behind technological advances, workplace leadership, and life success (see Amabile & Pillemer, 2012; Davila, Epstein, & Shelton, 2006; George, 2008). Florida (2005, 2017) makes a strong case that the American economy is powered not by information or knowledge, but by human creativity.

Of course, creativity's virtues extend beyond economic benefits. For example, creativity has been associated with maintaining positive mental health (Le, Cropley, & Gleaves, 2015), sense of meaningfulness (Averill, 2009), coping with trauma (Frisina, Borod, & Lepore, 2004), and sense of humor (Chang, Chen, Hsu, Chan, & Chang, 2015). With such a diverse array of effects, more and more attention and resources have focused on researching creativity. A good example of this is the application of creativity research in education: creativity has been included in the Partnership for 21st Century Skills (P21) Framework for 21st Century Learning as a key Learning and Innovation Skill (Guo & Woulfin, 2016; P21, 2015; Plucker, Kaufman, & Beghetto, 2015), and creativity has also been included in similar frameworks in several other countries, such as New Zealand, the UK, and China.

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What Is Creativity?

Williams (1999) noted that the usefulness of higher-order cognitive constructs is connected to the clarity with which they are defined and measured. Definitions of creativity have not always accomplished this and have sometimes been presented in a nonchalant manner. In fact, most creativity research does not include an explicit definition; this partially accounts for the often conflicting research on the topic. As such, those in the field become estranged from each other by semantic issues and those outside the field become distanced because it appears no one in the field can even define creativity. Plucker, Beghetto, and Dow (2004) proposed a synthesized definition of creativity based on several recurring elements from the literature. In this chapter, we adopt their definition: "Creativity is the interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context" (p. 90).

Theoretical Models of Creativity

There have been numerous conceptions of creativity and methods of measuring creative output. Although space does not permit a comprehensive overview of theoretical models, this section highlights a few of the more influential theories in the field.

The Divergent–Convergent Distinction

J. P. Guilford, who is often credited with catalyzing scientific research on creativity, proposed the famous divergent–convergent distinction in his Structure of the Intellect (SOI) Model (1967). According to Guilford, intelligence was not comprehensively measured in traditional intelligence tests; he conceived intelligence as a cube with three dimensions—operations, content, and products. Divergent and convergent productions are two of the five operations in the SOI model. Guilford (1968) framed convergent thinking as cognition used to identify one correct or conventional answer, while divergent thinking occurs when ideas move in varied directions. Guilford has also been credited with founding the psychometric measurement of creativity with the paper and pencil *Unusual Uses Test* (Sternberg & O'Hara, 1999).

Building on Guilford's work, Torrance (1974) created the Torrance Tests of Creative Thinking (TTCT), testing fluency (total number of responses), flexibility (number of different kinds of responses), originality (the uniqueness and rarity of responses), and elaboration (the detail of responses). Both Guilford's and Torrance's tests became the bedrock of the psychometric assessment of creativity, which essentially became the working definitions of divergent thinking theory (or even creativity theory). Their universal appeal and application is evident throughout the field (Kaufman, Plucker, & Baer, 2008).

Systems Theories

Although many researchers continue to study creative cognition and psychometrics of individual creativity, other scholars have shifted their attention to systems views of creativity. Csikszentmihalyi (1988, 1999), for example, has taken a systems view of creativity that emphasizes the interaction between an individual, the domain, and the field in which creativity occurs. The systems perspective focuses on the confluence of events that occur when creativity happens rather than considering creativity to be a trait of an individual. According to Csikzentmihalyi, creativity is not just a mental process, but also a cultural and social event. In a systems approach, a field is the social organization that makes decisions in a particular area. For example, most people do not understand Einstein's Theory of Relativity, but accept it as true because the gatekeepers in the field accept it. A domain is the cultural or symbolic portion relevant to creativity. Creativity "happens" when an individual changes a domain.

Componential Model of Creativity

Amabile (1983, 1996), whose work is among the most influential in the field, proposed a componential framework of creativity that took cognitive, personality, motivational, and social factors into account. The theory states that the creative process follows a fixed sequence of steps. The steps are problem presentation, preparation, response generation, response validation, and outcome. The three primary influences of the creative process are domain-relevant skills, creativity relevant-skills, and task motivation (Amabile, 1983). Domain-relevant skills vary depending on the person and the task at hand. However, task motivation is a prominent factor in the creative process and acts as a gatekeeper that determines whether the creative process is begun—or, once begun, continues. The theory was updated and modified (Amabile, 1996) to account for the potential nonlinearity of the creative process (i.e., the creative process does not always follow the steps in that sequence).

Investment Theory of Creativity

Unlike Guilford, who saw creativity as an aspect of his Structure of Intellect model, Sternberg asserts that creativity does not fully explain intelligence, and that intelligence does not fully explain creativity. In other words, creativity "comprises intelligence plus other things" (Sternberg & O'Hara, 1999, p. 254). Sternberg and Lubart (1995) elaborate on those "other things" in the Investment Theory of Creativity. According to the investment theory of creativity, creativity is the result of an interaction between an individual, an environment, and a particular task. Creative individuals are like financial investors who turn a profit by buying low and selling high. Translated to creativity, the creative individual formulates ideas that are not popular or well-developed and persuades others of their worth and value. However, once these ideas become accepted, the creative individual sells them and moves on to the next set of unpopular ideas. Sternberg and Lubart proposed six elements that work in concert to generate creativity in individuals: intelligence, knowledge, thinking styles, personality, motivation, and the environment. Creativity results when these elements are present in a given individual in a particular situation.

Developmental Theories of Creativity

The notion of "the 4th Grade Slump" in creativity development was first proposed by Torrance (1967, 1968), who noticed a trend when examining children's divergent thinking scores obtained in two elementary schools: there was a significant drop in creative thinking that occurs for approximately half of the children in fourth grade.

The slump is widely cited and attracted much attention because it fits well with general developmental trends (Maker, Jo, & Muammar, 2008; Runco, 2004). However, intraindividual variations in creative production vary substantially, especially when they grow up: Simonton (e.g., 1999) showed that creative production tends to follow an inverse-U development curve over time during adulthood, with the average age of peak creative production varying from domain to domain. For example, creativity in mathematics peaks between age 20 and 30, whereas biologists' creativity peaks on average two decades later. Torrance has also provided psychometric evidence of developmental changes (Torrance, 1968; Torrance & Gupta, 1964). These changes across the lifespan provide convincing evidence that creativity is not a static construct.

Sociocultural Models and Frameworks

One of the earliest models of creativity that remains in widespread use today is Rhodes' (1961) Four-P model. Rhodes noticed that creativity could be conceptualized as four distinct yet overlapping components: *person*, *process*, *product*, and *press*. *Person* takes into account aspects of an individual that makes him or her different from others, such as personality, ability,

thinking style, attitude, and behavior. *Process* focuses on creative thinking, stages and phases of the creative process, and the causes of creative behaviors. *Product* is the end result of the creative process, which includes not only perceptible items such as buildings, paintings, and inventions, but also creative ideas that can be embodied into tangible forms. *Press*, or *Place*, refers to the ecological environment in which creative people find themselves.

The Four-P model's straightforward nature is almost certainly the reason for its enduring popularity. But some questions remain unanswered. For example, how do tools and materials (an element of press/environment in the Four-P model), such as the recent development of information technologies, play a role in shaping creativity? What is the influence of peers and colleagues on creativity achievement at different levels of the Four-Cs? Glăveanu (2013) approached this topic from a sociocultural perspective and proposed the Five-A framework, including *Actor*, *Action*, *Artifact*, *Audience*, and *Affordance*. Although this framework looks very different from the Four-P and Four-C models, three of the components in the Five-A's and Four-P's models have almost identical meanings (e.g., person ≈ actor, process ≈ action, product ≈ artifact). The primary differences come from the last two components—*Audience* and *Affordance*—can be viewed as subcomponents of Press (or environment). Specifically, *Audience* refers to the social aspect of the environment, and *Affordance* refers to the material aspect of the environment. In educational settings, the former can be teachers and peers' reviews and comments, and the latter can be resources such as books, computers, and online resources.

Important Conceptual Issues and Debates in the Study of Creativity

Biological Bases: Disinhibited or Controlled?

There has been significant interest in finding the biological—and, more specifically, neurological—basis for creativity for some time. Numerous researchers have developed a series of hypotheses to be tested to better answer questions regarding the relationship between creativity and brain functions (Dietrich & Kanso, 2010; Heilman, 2005; Martindale, 1999), among which Martindale's (1999) theory of cognitive disinhibition was once the most well accepted neurological model for creativity. According to Martindale, the frontal lobe, which is part of all of executive functions, is responsible for the inhibition of creative behavior. Meaning our natural state is a wildly creative one, but our brains intervene and tone our creativity down so that we may function in day to day life. In other words, inhibition theory holds that creativity is not a function of self-control or will, but a product of spontaneous brain activities.

However, a more recent theory—*controlled-attention theory*—has challenged the notion that creative cognition is spontaneous rather than controlled (Beaty, Silvia, Nusbaum, Jauk, & Benedek, 2014). According to this framework, creative production is the result of controlled processes that provide goal-directed, top-down oversight. Those controlled processes may include fluid intelligence (Benedek, Franz, Heene, & Neubauer, 2012) and working memory capacity (De Dreu, Nijstad, Baas, Wolsink, & Roskes, 2012).

New developments in the neuroscience of creative cognition have enabled researchers to have a more comprehensive picture of underlying processes. With more and more evidence collected from studies that used resting-state and task-based fMRI, a new model that combines both cognitive disinhibition and cognitive control has been proposed, and that is called the *Default-Control Network Coupling Model* (Beaty, Benedek, Silvia, & Schacter, 2016). This model taps two of the mostly widely studied brain networks that underlie core cognitive and attentional processes—default network (which is associated with spontaneous and self-generated thought) and control network (which is associated with cognitive processes that require externally directed attention, including working memory, relational integration, and task-set switching). Although these two brain networks exhibit an antagonistic relation during various brain

activities, they have also shown cooperation and interaction during creative thinking activities. For example, default network may be responsible for the generation of candidate ideas, while the controlled network often contributes to the evaluation and modification of those ideas to meet task-specific constraints.

Investigation of Creativity: Big C vs. Little c Perspective

One of the most common ways creativity is distinguished in research is whether it concerns Big C or little c creativity. Under this conception, Big C creativity is eminent creativity such as the creativity of Freud or Picasso (Gardner, 1993). On the other hand, little c is everyday creativity: creativity that people can perform on a regular basis. Big C creativity has received extensive research attention (e.g., Gardner, 1993; Simonton, 1994), but overemphasizing Big C creativity may foster the belief that creativity is rare and available only to the lucky few (Plucker et al., 2004). Indeed, some researchers have found that teachers hold such a belief (e.g., Fryer & Collings, 1991). Lamentably, the vast majority of research on adult creativity focuses on eminent creativity and not everyday creativity. Possible explanations for this research imbalance include conceiving creativity to be limited to particular domains, thinking of creativity as an all-or-none, static construct, and believing creativity to be predominantly content-specific and context-bound.

Beghetto and Kaufman (2007) proposed adding an additional level, *mini-c*. Whereas Big C and little c creativity rely on interactions with others, mini-c is an intrapersonal assessment that extends the creative process to more than just external interactions. Runco (2005) proposed a similar conception of creativity called personal creativity. In personal creativity, any form of cognitive adaptation by an individual yields a creative product. Kaufman and Beghetto (2009) also proposed the *Pro-C* category, reflecting professional levels of creativity that rise beyond the personal but do not meet the standards of eminent accomplishment. When working with gifted students, mini-c and little c are of primary interest, although helping talented students perform as the Pro-C level is certainly attainable in some contexts. For example, young adolescents who score extremely highly on academic tests (top 1 in 10,000) grow up to achieve domain-specific Pro-C level creativity at rates far higher than (a) the typical adulthood base rates and (b) even those that score at the top 1% in academic performance (Kell, Lubinski, & Benbow, 2013; Makel, Kell, Lubinski, Putallaz, & Benbow, 2016).

In their "propulsion theory" of creativity, Sternberg and colleagues (Sternberg, 1999; Sternberg, Kaufman, & Pretz, 2001) have disaggregated creativity even further—into eight qualitatively distinct kinds of creativity. The concept of propulsion stems from the idea that a creative idea propels a field forward. These eight kinds of creativity are grouped into three categories: those that accept current paradigms, those that reject current paradigms, and those that synthesize current paradigms. The creative contributions that accept current paradigms are replication, redefinition, forward incrementation, and advance forward incrementation. The types of creative contributions that reject current paradigms are redirection, reconstruction/redirection, and reinitiation. Finally, integration is the label given for creative contributions that synthesize current paradigms. The distinctions are not meant to illustrate differences in quality or amount of creativity; rather, they simply differentiate types of creativity.

Is Creativity Domain-General or Domain-Specific?

One of the biggest debates involves whether creativity is predominantly domain-general or domain-specific. Researchers tend to disagree about whether a creative person tends to be creative in a particular domain or whether that person would be creative in numerous domains. The dominant position held today is that creativity is domain-specific. This position is supported by research on situated cognition and other areas within cognitive science (e.g., Barab & Plucker, 2002). Additionally, domain-specific creative tasks tend to have low correlations with each

other (Baer, 1998), and emphasis on task-specific training typically yields task-specific creative performance (Csikszentmihalyi, 1999; Gardner, 1993). Nonetheless, other researchers (e.g., Cramond, 1994; Plucker, 1998) argue that a domain-specific conception fails to account for theoretical and methodological issues. For example, a systems approach to creativity (e.g., Csikszentmihalyi, 1988, 1999) takes the view that creativity cannot be determined entirely within a domain. The interactions between person, context, and the domain must also be considered. Implicit theories of creativity also support a domain-general perspective (Lim & Plucker, 2001; Runco & Bahleda, 1986).

A more fruitful question may focus on which aspects of creativity are content-general and which are content-specific. Plucker and Beghetto (2004) suggest that these aspects may vary as a person develops and matures. Such distinctions are noteworthy because content general creativity implies that there are general skills that can be taught to enhance creativity. On the other hand, if creativity were content specific, general creativity training would not be effective.

Creativity and Mental Illness

There has been some evidence linking creativity with vulnerability to psychopathology (e.g., Kyaga et al., 2011). For example, Nettle (2006) found that artistically creative groups share the unusual experiences and cognitive disorganisation which typify both mild and severe psychopathology. Simonton (2014) demonstrated that creativity and psychopathology have different functions for different occupations: For writers and artists, the functions are positive linear; whereas for scientists, composers, and thinkers, the functions look reverted-U shapes. However, not all creative people or occupations have risks associated with mental disorder (e.g., Silvia & Kimbrel, 2010), and studies that provide evidence for the link between creativity and mental illness may be biased or have methodological issues (Glazer, 2009). Plucker et al. (2004) recommend that educators and psychologists view the relationship between creativity and mental illness as rare and largely unsupported by research evidence.

The belief in the relationship between creativity and mental illness is also manifested in less dramatic fashion in educational settings. For example, teachers may perceive creative students to be potential troublemakers and nonconformists (Chan & Chan, 1999; Scott, 1999). Having these beliefs may inhibit creativity and creativity enhancement in students and can even exist when teachers view creativity to be important (Dawson, 1997).

Creativity, Intelligence, Giftedness, and Other Psychological Constructs

For much of the twentieth century, it was believed that creativity and intelligence were closely related. In a retrospective analysis of the childhoods of some of the most eminent creators in history, Cox (1926) calculated the correlation between posited intelligence and the eminence (a proxy for creativity) of the individual to be 0.16. However, upon reanalysis, no such correlation was found (Simonton, 1976). More recent research on the relationship between creativity and intelligence has produced varying results (Fuchs-Beauchamp, Karnes, & Johnson, 1993; Getzels & Jackson, 1962; Kell et al., 2013; Robertson, Smeets, Lubinski, & Benbow, 2010; Runco & Albert, 1985, 1986). The "no threshold effect" findings seem to rely on measures of creative *accomplishment* while the "threshold effect" findings seem to rely on creative *potential* (DT tests). Additionally, intelligence and creativity theories have become increasingly more complex in recent decades (e.g., Ceci, 1990; Sternberg, 1988). Thus, comparisons of intelligence and creativity must also evolve with the increased complexity of theory.

Plucker and Renzulli (1999) concluded it was a matter of uncovering not whether, but *how* the two are related. Sternberg and O'Hara (1999) suggested five potential ways in which creativity and intelligence could be related, "(1) Creativity is a subset of intelligence; (2) intelligence is a

subset of creativity; (3) creativity and intelligence are overlapping sets; (4) creativity and intelligence are essentially the same things (coincident sets); and (5) creativity and intelligence bear no relation at all to each other (disjoint sets)" (p. 251). In a review of the research of the creativity–intelligence relationship, Sternberg, Kaufman, and Pretz (2002) concluded that the relationship depends largely on how each is defined and measured.

However, Sternberg et al. also concluded that creative people typically have above-average intelligence, but that the relationship between creativity and intelligence diminishes above an IQ of 120. This finding (often described as the Threshold Effect) may be the result of extremely high intelligence inhibiting creativity (Simonton, 1994; Sternberg, 1996).

The relationship between creativity and giftedness has also received substantial attention. Renzulli's three-ring definition of giftedness (1977, 1986, 2005) consists of the interaction of above-average ability, task commitment, and creativity (the three rings) within the interaction of personality and environment. Here, creativity composes a portion of gifted behavior. Renzulli and colleagues have developed a sophisticated method of schoolwide implementation emphasizing the three-ring conception thus simultaneously also implementing a schoolwide fostering of creativity (for a review, see Renzulli, 2005). Runco (2005) has defined creative giftedness as "(a) an exceptional level of interpretive capacity; (b) the discretion to use that capacity to construct meaningful and original ideas, options, and solution; and (c) the motivation to apply, maintain, and develop the interpretive capacity and discretion" (p. 303). In other words, both Runco and Renzulli appear to believe that creativity is a necessary but not sufficient component of giftedness.

Creativity and Gender, Ethnic, and Cultural Issues

In general, existing gender comparisons of creativity do not provide evidence of differences in overall creativity (Baer, 2012), but numerous studies have reported gender differences on specific *kinds* of creative behavior. For example, analysis of TTCT results showed no overall gender differences in creativity, but girls reported more sexual responses while boys reported more aggressive responses (Dudek & Verreault, 1989). Strough and Diriwaechter (2000) also found that boys were more likely to report aggressive ideas and were also less likely to report prosocial responses. But the research base on gender and creativity is rather thin and would benefit from considerable, additional research.

Interestingly, researchers tend to find more nuances in the relationship between creativity and race/ethnicity, with some studies reporting no significant differences between Caucasian and African Americans (Ivcevic & Kaufman, 2013; Torrance, 1971, 1973) but significant differences between Caucasian and Hispanic students (e.g., Garcia, 2003) in creative production, creative thinking, or self-estimates of creativity. Kaufman (2010) went so far as to suggest creativity should be included as a component of standardized tests, such as college admission tests, in order to reduce ethnic biases. Given the paucity of research in this area, and the fact that most of the recent research involves use of self-reports of creativity, a great deal of study is needed before interventions can be designed and implemented.

Perhaps a more important question for educators deals with how ethnic diversity contributes to group creativity, since most occupations require teamwork. McLeod, Lobel, and Cox (1996) provide evidence that the ideas produced by ethnically diverse groups were of higher quality than ideas produced by homogeneous groups, and subsequent research has reached similar conclusions (e.g., Li, Lin, Tien, & Chen, 2015; Stahl, Maznevski, Voigt, & Jonsen, 2009).

Creativity Assessment

Historically, there have been four routes to assessing creativity. Frequently referred to as the four P's, here we instead call them Person, Product, Process, and Press (which means Environment). The following section discusses

what each path to assessing creativity entails and how each is used to assess creativity (for a more detailed review of creativity measures, see Kaufman, Plucker, & Baer, 2008).

Personality Assessments

Three types of personality assessments of creativity are valuable for educators and psychologists working with gifted students: personality instruments, biographical inventories (both self- and other-report), and attitudinal measures.

Personality instruments. The most frequently used personality measures rely on either self-report or external ratings. Personality instruments are typically created by studying creative people and finding similarities in their personalities. Thus, personality instruments rely on the assumption that those whose personalities are similar to creative individuals are more likely to be creative individuals themselves.

Davis (1992) found several personality traits associated with creative people across numerous personality instruments. These traits include awareness of being creative, originality, independence, propensity to take risks, personal energy, curiosity, humor, attraction to complexity and novelty, artistic sense, open-mindedness, need for privacy, and heightened perception. Another common personality trait found in creative people is a tolerance for ambiguity (Dacey, 1989; Sternberg, 1988).

Biographical inventories. Some might be surprised that biographical inventories are considered personality assessment, not product assessment. We place this section here because biographical inventories do not directly assess an actual product. Some researchers (e.g., Hocevar & Bachelor, 1989; Wallach, 1976) prefer biographical instruments to other methods of measuring creativity. These measures follow the assumption that prior creativity is the best predictor of future creativity (Colangelo, Kerr, Hallowell, Huesman, & Gaeth, 1992). Thus, self-reports of prior (and sometimes current) behaviors are used to estimate creative potential.

In some cases, such as with small children or with groups, self-report assessments are not useful. To address these situations, numerous instruments that allow others (e.g., parents, teachers, or peers) to complete them have been developed (Runco, 1989; Torrance, 1962). Research on the validity of external ratings has been inconclusive; some support validity claims (e.g., Runco, 1984), while others do not (e.g., Hocevar & Bachelor, 1989; Holland, 1959).

Attitude measures. Regarding the importance of attitudes in the business world, Basadur and Hausdorf (1996) stress that knowing the attitudes of managers can help dictate the appropriate course of action to facilitate future performance. Further, ideational thinking and attitudes have been connected (Basadur & Finkbeiner, 1985) with the Runco Ideation Behavior Scale essentially assessing both aspects of the creative person (Plucker, Runco, & Lim, 2006; Runco, Plucker, & Lim, 2001). Such ideas have only recently been transferred to the school setting, making this an area in which major contributions can be made.

Product Assessments

Measures of creative products have been examined many times for reliability, but validity remains an issue, in part because there is no universally accepted criterion of creativity (see also Plucker, Holden, & Neustadter, 2008). The most common method used to estimate the creativity of a product is Amabile's (1983) Consensual Assessment Technique (CAT). The CAT measures creative production in a unique way by eliminating a perceived weakness of prior work: providing raters of creativity with definitions or criteria. Because the CAT uses an implicit definition of creativity, "a product or response is creative to the extent that appropriate observers independently agree it is creative" (Amabile, 1982, p. 1001), individual differences in interpretation of "creativity" are muted. Despite allowing judges to use their implicit definitions, creativity is reliably assessed (Amabile, 1982). The CAT has been applied to an array of creative products (e.g., Kaufman, Baer, Cole, & Sexton, 2008).

Selection criteria for who is considered an expert can vary substantially across numerous factors including the skill of the subjects, the skill of the judges, the target domain, and purpose of the assessments (Amabile, 1996; Plucker, Kaufman, Temple, & Qian, 2009; Runco & Chand, 1994). However, judges should have some familiarity with the domain. For example, Dollinger and Shafran (2005) allowed judges to preview products similar to those they would be rating, which increased the correlation between expert and novice judges from 0.74 to 0.90.

Process/Cognitive Assessments

Tests that measure divergent production have been the dominant method of creativity measurement for over 40 years, particularly in schools. DT is not the sole component of the creativity process, but it is often used as a proxy for the creative process. Research has been conducted to examine how well divergent thinking predicts creative achievement, with mixed evidence and conflicting opinions found in those studies. On the one hand, DT tests show evidence of reliability and concurrent validity (e.g., Plucker, 1999; Torrance, 1968, 2008). On the other hand, many scholars have questioned DT tests' predictive validity (Gardner, 1993; Weisberg, 1993). This has led many researchers and educators to avoid using DT tests and criticism of the psychometric study of creativity (Plucker & Makel, 2010).

However, many of these criticisms are overstated, and the psychometric quality of DT tests has significantly improved. Some studies have suggested the use of alternatives to increase reliability and external validity, including summative scores (adding up all four component scores), highly uncommon scores (top 5% in originality), weighted fluency scores, and percentage scores (dividing originality scores by fluency scores) (see Benedek, Mühlmann, Jauk, & Neubauer, 2013; Plucker, Qian, & Schmalensee, 2014; Plucker, Qian, & Wang, 2011).

Environmental Assessments

Amabile's (1983, 1996) work on the social influences of creativity was the forerunner of numerous other approaches emphasizing environmental influences on creativity. Sternberg and Lubart's (1991) investment theory and Csikszentmihalyi's (1988, 1999) systems approach are examples of creativity conceptions in which environmental contexts are emphasized.

The dearth of psychometric investigations of environmental assessments of creativity, especially for classrooms, is a notable weakness in the field (Abdulla & Cramond, 2016). Specific environmental variables that facilitate (and inhibit) creativity need to be determined. Amabile and colleagues (e.g., Amabile, Conti, Coon, Lazenby, & Herron, 1996) have been working on developing such measures for the work place, but research on applications for the classroom (e.g., Hill, 1991) has not advanced beyond exploratory studies.

Fostering Creativity

How can educators help students realize their creative potential? In this section, we summarize recent work on research-based strategies to foster creativity. These strategies and techniques require careful preparation and planning so that they can be integrated into the established curriculum. Two or more of these techniques can be combined to heighten the chance of success with students (Plucker, Runco, & Hegarty, 2011).

Fostering Creative Attitudes

Not all creativity is deliberate. However, the likelihood of fulfilling creative potentials greatly increases if they are intentionally targeted and enhanced (Runco, 2014). In fact, most creative achievements are the result of hard work and considerable time rather than a brief flash of insight (e.g., the "Aha!" moment). Unfortunately, many students and teachers tend to hold some mystical views about creativity, contending that their

unconscious, or Muse, is the source of inspiration while ignoring the role of intentionality and choice behind creative acts.

Similar myths have been identified by Plucker et al. (2004), who argued that creativity has long been subject to a number of inaccurate beliefs. First, the myth that people are born creative or uncreative yields an inaccurate conclusion that creativity is an innate ability that cannot be taught. Second, the myth that creativity is intertwined with negative aspects of psychology and society evokes the image of a mad genius with neurotic tendencies. Third, the myth that creativity is a fuzzy, soft construct, leading people to believe that creative behavior resides in the world of pop psychology and is not worthy of scientific scrutiny or empirically supported interventions. Fourth, the myth that creativity is always enhanced within a group, which leads to the belief that if more people work together, more ideas will be produced, and creativity will be enhanced.

These myths are detrimental to both personal (e.g., the development on one's unique talents; Silvia et al., 2014) and external (e.g., the enhancement of creativity in schools) creative processes. We can tackle these myths in educational settings by providing students with the correct creativity "schema" as supported by scientific research (Plucker & Dow, 2017). Of course, teachers' attitudes toward creativity need to be changed as well, which in turn may influence students' attitudes and creative thinking (Grohman & Szmidt, 2013). In addition, other more general beliefs, such as beliefs about the nature of knowledge, may also impact teachers' creativity instruction. For example, teachers who perceive their instruction as enhancing student learning rather than merely presenting factual knowledge are more likely to infuse creativity into their teaching practice (Hong, Hartzell, & Greene, 2009).

Developing Creative Ideation

Divergent thinking training has proven to be effective (Pyryt, 1999). For example, Baer (1996) used divergent thinking training in poetry, and creativity on a subsequent poetry writing task was significantly improved. As a result, he suggested that ideational training should focus on skills related to the task domain in order to improve creative performance. If a teacher wants to improve creative performance on different types of tasks, then the training should use a wide range of content in a variety of ideational exercises. Along the same line, Pang (2015) proposed several ideational tasks for different subjects that could promote creativity in classrooms. Students can be encouraged to interpret texts in different ways and to construct their own storylines in reading and writing class; math teachers could show students how to solve a problem using nontraditional methods so that risk-taking and creative thinking are encouraged; in science class, instructors could demonstrate the nature of constructing science knowledge by asking students to form and test their own hypotheses in an experiment; in art and music classes, students could design, compose, and create their own works with the help of a variety of tools (e.g., music and picture editing software).

Another way to encourage creative ideation, as proposed by Beghetto (2013), focuses on the role of teacher responses to students' comments. Beghetto argues that teachers should recognize and respond to the opportunities provided by the unexpected and surprising ideas emerging in everyday practices and preplanned activities. These opportunities are called Micro-Moments (MM). Unlike the DT training method, the MM approach does not require that teachers make a detailed plan of how to encourage students to come up as many "wild" ideas as possible. Rather, it asks teacher to expect the unexpected during planned lessons. Despite the fact that this would bring uncertainty to the established curricular, unexpected ideas can be task appropriate and perhaps more meaningful than, for instance, assigned brainstorming tasks.

Play-Based and Game-Based Intervention

Play-oriented or game-based approaches may support creativity development for people of different ages. This technique has received strong

support because games are a common everyday activity which can be incorporated into almost any instructional practice. Russ (2014), for example, makes a compelling case for pretend play and has suggested methods to conduct an intervention, suggesting that pretend play may provide important practice solving real-world problems and processing emotions, both of which foster creativity (Russ & Wallace, 2013). Other researchers have implemented interventions either based solely on pretend play (Garaigordobil, 2006) or incorporate pretend play as part of a broader creativity intervention (Alfonso-Benlliure, Meléndez, & García-Ballesteros, 2013). Although imaginative play and pretend play have been shown to be particularly effective, other forms of play also boost creativity. Cumming (2007) observed that, when endorsed and encouraged by teachers, students will interact eagerly with poetry and display their creativity through word play (see also Cremin, Burnard, & Craft, 2006; Kangas, 2010).

Gamification is not without its challenges. Teachers may find it difficult to adopt and switch between a variety of roles (e.g., facilitator, instructor, learner), and use of digital or video games may prove distracting (Davies et al., 2013; Groff, Howells, & Cranmer, 2012; Kangas, 2010). Educators need to consider several factors, including game selection, how games align with their teaching goals, monitoring gaming to minimize distraction, and cost-effectiveness compared to other pedagogies.

Creative Modeling

Many human behaviors, including creativity, are learned by observing an appropriate model. Evidence supporting the effects of creative modeling comes from a variety of sources, including classroom-based instruction (Yi, Plucker, & Guo, 2015). By demonstrating creativity, teachers establish a creative environment that can inspire students and encourage them to come up with novel ideas, to take risks, and to show meaningful self-expression (Beghetto & Kaufman, 2014). Teachers need not be the only models. Simply presenting examples of creative work produced by others (e.g., peers, former students, adults in the community) can inspire students. A convincing body of research supports the use of models to enhance the creativity of both children and adults (Amabile, 1983; Hooker, Nakamura, & Csikszentmihalyi, 2003).

Facilitating Peer Collaboration

Peers can serve as sources of creative inspiration and thus supplement many of the roles traditionally thought to belong to teachers alone (Hooker et al., 2003; Tse, Fung, Nakamura, & Csikszentmihalyi, 2016). Nonetheless, research on group creativity has produced mixed results. On one hand, peers may hinder the creative process while at the same time give the illusion of productivity (Paulus, 2000). Take brainstorming as an example, with research finding that people may be more productive in solitary ideation rather than group brainstorming due to a variety of issues, such as lack of accountability, social pressure, awareness of evaluation from group members, and competition for speaking time (Paulus & Brown, 2003). On the other hand, some groups, especially individualistic groups (Curşeu & Brink, 2016), can achieve extraordinary levels of creativity by building on each team member's idea, which is also referred to as creative synthesis (Harvey, 2014).

Successful collaboration requires far more than a group discussion or division of labor. In order for group members to learn and solve problems together collaboration should emphasize continuous mutual effort from group members including idea exchange; collective goal setting; and achieving, negotiation, and consideration of other social dynamics. Costantino (2015) argued that timely feedback delivered by friends and classmates is a powerful tool for teachers to facilitate a creative environment where students are more likely to focus on creative tasks and thus achieve creative goals. An effective feedback process is characterized by clear goal setting, effective communication, actionable suggestions, and active monitoring.

Not all students may participate effectively in collaboration, especially in groups where there is a large difference in abilities, goals, and social skills. One way to balance these differences is to provide a "script" for students to play specific roles (such as consultant and presenter) so that they can learn more from cooperation and collaboration (O'Donnell, 1999). Overall, the teacher's guidance—including setting up guidelines, motivating students, preventing disrupting behaviors, modeling appropriate conversations, and keeping students focused—is necessary and beneficial to the facilitation of group creativity.

External Resources

Our current, educational accountability systems still put a strong emphasis on achievement tests, which often marginalizes creativity instruction (Beghetto & Plucker, 2016). Furthermore, even though many teachers value and teach creativity in the classroom, this may be a time-consuming, uncomfortable, and stressful task (Cremin, 2006; Plucker & Beghetto, 2003). One way to deal with this issue is to provide students and teachers with external resources.

For example, technology offers students and teachers additional opportunities to engage with information. There have been numerous studies that clearly show that technology holds great potential to enhance and assist creativity in the classroom (Guo & Woulfin, 2016). One such benefit of technology is its ability to provide immediate external representation of complex information, such as the visualization of creative processes. This representation can help enable creative actors to review and modify, improve, or enhance their creative action (Andersen, 2014; Yee, 2015). Another benefit of using technology in the classroom is the enhancement of communication and collaboration in creative activities (Dilley, Fishlock, & Plucker, 2015; Plucker, Kennedy, & Dilley, 2015).

What Don't We Know About Creativity: And What Do We Really Need to Know?

As described in this chapter, researchers know a great deal about the nature of creativity and how to foster it with children. But there are a number of areas within creativity research and education that need attention if the field is to thrive in the future.

Collaboration with Other Fields

Creativity is applied within disciplines, yet much of our creativity scholarship is not applied to specific domains. This disconnect is especially glaring in fields that can be considered creative industries (e.g., fashion design, advertising, and engineering). Creativity researchers and educators rarely interact with their peers in these other fields, and the result is a tremendous lost opportunity to expand the field's knowledge and impact. We also believe creativity has not looked carefully at other areas *within* related fields like psychology, education, and other social sciences. For example, creativity as a field has not widely incorporated sociocultural perspectives (see Glăveanu, 2013, 2014, for the exception that proves the rule). In a field that often notes the importance of context (e.g., Plucker et al., 2004; Plucker & Beghetto, 2004), being over 20 years late to embracing sociocultural perspectives has been a tremendous lost opportunity.

Moving Beyond Western Conceptions

The field's knowledge base comes almost entirely from a Euro-American perspective, yet significant creativity initiatives—both in research and education—have occurred and are occurring all over the globe. This is regrettable given that (a) the majority of the world's population lives outside of the West and (b) these cultures have rich

philosophical traditions with creativity that go back thousands of years. With the strong emphasis on creativity and innovation in countries such as China (Pang & Plucker, 2013), there are plentiful opportunities to reach across cultures and learn from each other. Fields such as intelligence are starting to incorporate non-Western perspectives (e.g., Pang, Esping, & Plucker, 2017), but creativity has seen this work occur quite rarely.

Improved Interventions and Assessments

Why do the misconceptions about our interventions and assessments, described in the opening anecdote in this chapter, continue to exist? We believe two possible causes are a lack of experimental studies and few attempts to scale our interventions to large populations of students. Both deficits are understandable: Experimental studies are resource-intensive and often difficult, and studying the effects of small-group brainstorming with one classroom of students is a lot easier than studying the use of small-group brainstorming in 100 schools across ten states.

But the advantages to the field of doing these types of large-scale projects are almost immeasurable, as the growth in our ability to impact students' lives will be matched by a considerable deepening of our understanding of the nature of creativity. Quite frankly, we find it difficult to conceptualize a successful field of creativity studies in a couple of decades without widespread efforts to use experimental methods, replicate those studies, and scale up our assessments and interventions so that they can be used at state and national levels. Other fields such as psychology are improving their methods by increasing their focus on transparency, replication, moving toward explicitly confirmatory practices (Makel & Plucker, 2017). If creativity wants to maintain, much less improve, its relevance and credibility as a research field, its methods will have to keep up in terms of trust, accuracy, and transparency (Makel, 2014; Makel & Plucker, 2014).

Acknowledgement of Creativity Excellence Gaps

The importance of addressing excellence gaps—differences in advanced achievement between subgroups of students—has been emphasized in K-12 education as of late (Plucker & Peters, 2016). This work has developed to the point that states are beginning to develop policies that help close these gaps. Extending this framework to addressing creativity excellence gaps has been less successful, probably due to two reasons. First, the lack of a large-scale assessment capability mentioned above certainly limits the available data that is needed to establish the ubiquity (or not) of these gaps. Second, there remains a belief within the field that scores on creativity assessments generally do not show evidence of racial or socioeconomic differences.

As tempting as it is to believe this second point—which would mean that creativity is the key for addressing inequality, one of society's most vexing problems—we believe the data in support of this point is rather weak, supported largely by small-sample, unreplicated studies. We need to study the issue of demographic differences in assessments, and the presence of creativity excellence gaps in general, in order to help creativity achieve its potential to help improve the lives of *all* students.

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7 Emotional Intelligence (EI) and the Gifted

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Abstract

This chapter examines the nexus of relations between the highly visible and popular, yet controversial, concept of emotional intelligence (EI) and gifted students. We begin by a brief discussion of the elusive EI construct and its practical utility. We then broadly outline the relationship between EI and both high ability and classroom achievement. We then zoom in on more direct research focusing on EI in gifted vs. non-identified students. We conclude by discussing training of EI for gifted students and present a number of tentative guidelines and considerations for program development in the emotional domain.

A glance at the giftedness literature over the recent years reveals a surge of interest in emotional attributes of gifted and talented children (see Shani-Zinovich & Zeidner, 2013 for a review). This has been motivated, in part, by the purported role of affective characteristics as forces impacting both talent development and well-being of the gifted. Yet research on the emotional abilities of gifted and talented students has generally been given short-shrift, when compared to the massive amount of research on cognitive facets of the gifted. In fact, the gifted education movement and accompanying literature has traditionally been associated with definitions and conceptions of giftedness that mainly focus on extraordinary cognitive abilities and talents in specific domains (Feldhusen, 1998).

As pointed out by Pfeiffer (2001), the focus on cognition in high ability and giftedness research, to a large extent, grew out of the pioneering work of Lewis Terman and Leta Hollingworth, two noted psychologists devoted to the adaptive development of gifted children and youth (Pfeiffer, 2001). Following the tradition set by these psychological pioneers, most theorists have followed suit, defining giftedness as involving an especially high intellectual or technical aptitude in one area or another (e.g., Renzulli, 2005). Because giftedness has traditionally been defined by the child's cognitive functioning and abilities, with an added dose of creativity and motivation, this has left open questions of how being gifted might impact emotional abilities.

Although the socio-emotional status and profile of gifted students is currently being debated, systematically addressing emotional issues in gifted education should help gifted children in a number of ways, such as developing adaptive emotional competencies (expressing emotions effectively, showing empathy, regulating emotions), fostering strong social relations and

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networks, boosting self-image, relieving social stress and anxiety about being gifted, and helping the gifted create more meaningful lives (Van Tassel-Baska, 2006). Emotional skills training may be especially valuable to those gifted students who are vulnerable to social-emotional deficits. For those gifted students who are characterized by troubling social, emotional, or interpersonal behaviors, the EI construct offers a useful conceptual framework to assist the counselor or school psychologist in designing helpful therapeutic interventions.

Goals and structure. In this chapter we review current thinking and research on EI in gifted students. We begin by presenting a brief overview of the popular, yet contentious, construct of emotional intelligence. We then move on to discuss what we currently know about the relationship between emotional intelligence and both cognitive ability and school achievement. We then zoom in on the sparse research directly related to EI in gifted vs. unidentified students. We then discuss how best to train and cultivate EI competencies in the gifted.

Emotional Intelligence: A Brief Overview

Emotional abilities have been recently touted as an important subset of twenty-first Century Skills, essential for social, academic, and occupational success and thriving in modern society (Kyllonen, 2012). The gifted education literature over the recent decades attests to a growing interest among educators of the gifted and psychological researchers interested in these twenty-first century skills, by attempting to fathom the emotional characteristics of gifted and talented students and in cultivating their emotional competencies. This surge of interest is largely motivated by the claimed role of affective and social characteristics of individuals as forces impacting both the talent development and well-being of the gifted.

In the passages to follow we provide a brief overview of the popular construct of EI. Because it is important to begin with a working definition of EI, we will, for now, take this term to refer to a generic competence in perceiving, understanding, and management of emotions (both in one's self and in others). Thus conceived, EI appears important because many people fail to differentiate, understand, or express their emotions effectively in social contexts, or regulate their emotions successfully.

Since its popularization in the early 1990s, emotional intelligence (EI) has been a high profile, yet contentious, construct in modern-day psychology, catching the imagination of the academic and educational community, the commercial world, and the general public, alike. EI is one of those concepts we find it easier to recognize than to define. The quality is apparent in teachers who inspire even the most challenging and recalcitrant student, in those in the caring professions who work to assuage mental suffering, and in leaders who inspire others and articulate their followers' vision.

EI represents the convergence of two historical and social trends, briefly described below. The first trend relates to changing views about the functional importance and adaptive utility of emotions. The traditional view of emotion in relation to cognition has been that "passion" and "reason" are antithetical and antagonistic. Reason has traditionally been viewed as rational, mature, and systematic, facilitating rational thought and sound decision making; emotions have traditionally been viewed as being chaotic, immature, and haphazard, as well as disruptive to rational thought and decision making. By contrast the current EI view of emotion in relation to cognition views emotions as adaptive and functional. Emotions support attention, motivation, and memory, helping us to learn, make wise decisions, and maintain positive social relationships (Lazarus, 1991).

A second historical and social trend is a broadening view of what it means to be intelligent and competent in modern society. In contrast to the conventional view that equates intelligence with analytic ability (IQ), current conceptions view intelligence as encompassing a wider and more

diverse set of mental abilities than traditional IQ, including emotional and social competencies. The Harvard psychologist Howard Gardner included "personal intelligences" in his 7-facet model of intelligence. He differentiated *intrapersonal intelligence* (awareness and discrimination of one's feelings, goals, and intentions) from *interpersonal intelligence* (understanding the feelings, motivations, and intentions of others). These personal intelligences largely overlap with the domain of discourse of modern conceptions of EI. In addition, Robert Sternberg's tripartite model of intelligence further broadened the universe of intelligence discourse by included creativity and practical intelligence in social contexts, along with the more traditional form of analytical ability (Henry, Sternberg, & Grigorenko, 2005).

The modern concept of EI was popularized in psychological circles by two psychologists, Jack Mayer and Peter Salovey (e.g., 1993). They proposed an ability-based model of EI, conceptualizing EI as a form of intelligence, in which an individual processes emotional information. That is, EI essentially refers to being intelligent about one's emotions: intelligently identifying, expressing, understanding, and regulating emotions in self and others. These scholars conducted some of the most seminal research in this area and developed state-of-the-art ability assessments of EI.

Two Competing Models of EI: Ability and Trait

The EI construct is wide-ranging and it still remains unclear what it represents conceptually and what human qualities are central to it (Zeidner, Matthews, & Roberts, 2001). A basic difficulty has been that different psychologists have disparate visions of what a science of EI should look like. Indeed, it may be that different research teams are investigating entirely different personal qualities. We now briefly discuss the major fissure in approaches to EI, between ability-based and personality trait models and accompanying assessments.

1. *Ability models*. As noted, Salovey and Mayer (Mayer, Salovey, & Caruso, 2000) defined EI as an ability, resembling other standard intelligences. That is, high EI persons are objectively superior to those of lower EI in performing certain activities associated with emotions. Indeed, in their four-branch model, Mayer et al. differentiate four essential components of EI: identifying and expressing emotions, assimilating emotions into thought, understanding emotions, and regulating or managing the emotions of one's self and others.

   According to this ability model, EI is best measured through objective tests akin to IQ tests. Mayer and colleagues have published two widely used tests for EI, the *Multi-factor Emotional Intelligence Scale* (MEIS), and its successor, the *Mayer–Salovey–Caruso Emotional Intelligence Test* (MSCEIT). These tasks present the respondent with problems that can be scored on the basis of consensus or expert opinion. One problem with these measures is that it is hard to write test items relating to emotional functioning that can be objectively scored. The correct way to handle an aggressive coworker or comfort an upset family member may depend on cultural norms, social circumstances, and the particular individuals concerned.
2. *Trait model*. Trait EI, according to its key proponents, represents an over-arching personality factor that represents the person's emotional self-confidence and well-being (Petrides, Furnham, & Mavroveli, 2007). Like conventional personality traits, trait EI represents a qualitative style of behavior and experience that is adaptive in some contexts but not in others. As with other aspects of personality, EI may then be assessed via questionnaire, assuming that people have sufficient insight into their own emotions and real-life functioning for self-reports to be valid (e.g., Schutte et al., 1998).

Affective and Cognitive Correlates

Some rather extravagant claims concerning the real life applications and practical utility of EI have created considerable excitement about the potential of applications of EI in education, industry, health, and social behavior; we focus on education herein. Thus, EI has been touted as a major predictor of educational outcomes and even a stronger predictor than existing measures of ability or personality (e.g., Goleman, 1995). Furthermore, amid the growing public efforts to promote the development and emotional learning in school aged youth, EI has been claimed to be an important protective factor in the process of resilience and adaptation (Brackett et al., 2009). We now look at the evidence for affective and cognitive outcomes of EI.

Affective outcomes. The empirical literature provides evidence showing that emotional abilities predict a wide array of adaptive outcomes. Meta-analytic data show small to moderate effect sizes (*r*s) for the association between EI and mental health: A mean correlation of 0.23 was reported in the Schutte, Malouff, Thorsteinsson, Bhullar, and Rooke (2007) study versus a mean correlation of 0.36 reported in the Martins, Ramalho, and Morin (2010) meta-analysis. Both investigations also found that when measured as a trait, EI was more strongly associated with mental health then when measured as ability. Some of the relevant studies have shown that EI remains predictive of mental health with standard personality factors controlled (e.g., Austin, Saklofske, & Egan, 2005; Petrides, Furnham, & Mavroveli, 2007), although the incremental validity of EI over personality is modest.

Furthermore, Zeidner, Matthews, and Roberts (2006) summarized much of the research linking EI and coping, noting that correlations among these constructs range between 0.20 and 0.60. Trait EI shows a consistent positive relationship to problem-focused coping, and a consistent negative association with emotion-focused coping. Moreover, trait EI has some incremental validity in predicting coping, with the Big Five controlled (Petrides, Pérez-González, & Furnham, 2007).

Cognitive outcomes. Studies have confirmed that ability EI predicts students' grades, with studies showing this occurs both for broad assessments such as the *MSCEIT* (Rivers, Brackett, Salovey, & Mayer, 2007) and narrower measures, such as the *Situational Judgment Test of Emotion Management* (MacCann, Wang, Matthews, & Roberts, 2010). This latter study is especially noteworthy as it suggests that the EI measure remains predictive of grades after controlling for both socioeconomic status and general cognitive ability.

With respect to trait measures of EI, meta-analysis of 74 effect sizes (total N = 10,292) found a small but significant average r of 0.20 (Perera & DiGiacomo, 2013). The effect size was larger in younger children. In addition, EI remains predictive of scholastic performance with general intelligence controlled (Siegling, Vesely, Saklofske, Frederickson, & Petrides, 2015).

EI and Sociocultural Diversity

A growing body of research has highlighted the effects of cultural and social background on psychological traits, states, and processes. It is now readily apparent that research based on measures developed and standardized in the West, mainly for mainstream students, as is the case for the most prevalent EI measures, should not be automatically used and generalized across sociocultural groups or different cultures (Triandis, 1999).

The lion's share of EI research has been conducted in Western societies and modern cultural settings. These cultures have been recently dubbed WEIRD cultures (White, Educated, Industrial, Rich, and Democratic). It is not implausible that EI is a culture-bound construct that reflects Western cultural values and attitudes. In fact, some research suggests that cultural differences (e.g., individualist vs. collectivist) exist across a wide range of emotion-related abilities that essentially comprise the construct of EI. For example, compared to individuals from collectivistic cultures, people from individualistic cultures are better at recognizing and understanding emo-

tions (Matsumoto, 1992), are more likely to express their emotions (Fernandez, Carrera, Sanchez, Paez, & Candia, 2000), and are better able to regulate their emotions (Gross & John, 2003). Thus the processes underlying EI competencies and their manifestations may differ across cultures as a consequence of the role culture plays in the development, display, and interpretation of emotions (Palmer, Gignac, Manocha, & Stough, 2005).

Regardless of how EI has been measured, the possibility for cultural relevancy has been largely ignored in past research. The most common measures of EI include items that are likely to be problematic outside the USA. Take, for example, the following item: "I can readily relate my emotions to others." The implication that emotions can (and should) be related or conveyed to others may not be transferable to all cultures. Given that cultures have been found to vary on a variety of fundamental values, attitudes, and assumptions, it is probable that emotional intelligence is likely to vary and even take on different meanings across cultures. Another case in point: As a possible way of handling an emotionally laden situation with one's colleague at work, "Inviting my colleague to a bar for a drink" may work quite well in the UK or in Australia, but could cause police harassment and arrest in a more traditional Moslem culture (e.g., Saudi Arabia), ruled by Sharia law (strictly forbidding alcoholic consumption). Consequently, the universal applicability of certain established theories and practices in the field of EI must be reviewed and verified empirically, especially if they are overly reliant on data from individualistic cultures. Similar constraints may apply to assessing gifted minority groups coming from diverse cultural backgrounds.

Furthermore, the role of culture may result in some competencies being more predictive of school, work, or social performance, with competencies taking slightly different form given the specific culture under study. For example, the specific behaviors associated with leadership or social influence may differ slightly between different cultures and socioemotional groups, although it is hard to imagine a leadership role in any culture in which a leader's ability to influence others is not related to their performance.

Finally, although much has been written about how to develop emotional intelligence competencies in the school, workplace, and health settings and clinics, few positive evaluation studies of EI-related programs in different cultures have been published within peer-reviewed academic journals. While the results of this research are generally positive, the populations under study all represent "Western cultures" (i.e., the UK, the USA, Australia, and Israel). What has yet to emerge in the literature are rigorous program evaluations from outside the West. A key question which remains for the field is the issue of how culture might interact with the development of EI. Specifically, can we generalize specific methods and techniques to diverse cultures or will some methods need to be adapted to take culture into account.

Regrettably, to date, there is little culturally informed research on EI among gifted students. Such research is sorely needed.

EI and the Gifted

Rather little research has directly addressed the relationship between intellectual giftedness and EI. Research on emotional intelligence (EI) may inform understanding of the characteristics of emotional functioning in gifted children (Pfeiffer, 2001). This construct remains controversial in educational psychology, but it may prove useful for exploring interrelationships between cognitive and social-emotional competencies (Matthews, Zeidner, & Robert, 2002). Indeed, the pioneers of systematic testing for EI (Mayer, Perkins, Caruso, & Salovey, 2001) proposed that children high in EI should be able to represent information about emotional encounters in greater accuracy, depth, and richness, supporting social adaptation.

In the sections to follow we review two indirect sources of evidence relating EI to high ability. Specifically, we first present empirical support for the relationship between EI and intellectual ability and then examine the relationship between EI and academic outcomes

such as grade point average (GPA). We then present the scant direct evidence on EI in gifted children.

EI and Cognitive Ability

The standard psychometric theory of general intelligence (Spearman, 1927) predicts that social-emotional abilities, subsumed under the broader rubric of EI, should be positively related to cognitive ability. In fact, according to the "positive manifold" construct of psychometric theory (i.e., consistent positive correlations among measures of ability), any measure designed to assess an intelligence, including measures of EI, should show convergent validity by being significantly and meaningfully correlated with general ability.

Furthermore, as noted by Kong (2014), EI entails two different types of ability: (a) *crystallized ability* components (largely verbal) that require acquired emotion knowledge (e.g., accurately identifying and labeling a specific emotion) accumulated over time, and (b) *fluid ability* components (largely nonverbal) that require reasoning (effectively implementing a self-regulation strategy in a novel emotionally laden situation). It follows that ability-based EI should be significantly and meaningfully correlated with both verbal (crystallized) and nonverbal (fluid) forms of ability, as well as general ability (IQ).

A number of correlational studies point to meaningful relations between *ability EI a*nd cognitive ability. A recent meta-analysis by Kong (2014) reported that ability-based EI, assessed by the *Mayer–Salovey–Caruso Emotional Intelligence Test* (MSCEIT) or the *Multifactor Emotional Intelligence Scale* (MEIS), was positively correlated with three indices of intellectual ability: overall intelligence (mean $r = 0.30$), verbal intelligence (mean $r = 0.26$), and nonverbal intelligence (mean $r = 0.23$). Gender was shown to moderate the relationship between overall MSCEIT/MEIS and verbal intelligence alone, suggesting that the convergence of overall ability EI and verbal intelligence may be stronger among men than among women. Also, the relationship between EI and ability was observed to increase with age. Overall, high intelligence appears to be positively associated with higher EI (when assessed as ability).

By contrast, studies of *trait EI* and intelligence provide a more clouded picture. Across studies, no consistent association has been found between trait EI and high cognitive ability and contradictory findings on facets of trait EI have been reported (for a review, see Matthews, Lin, Zeidner, & Roberts, 2017). Albeit, trait EI is linked modestly to grades, suggesting that those gifted children who happen to be low in trait EI may underachieve.

EI and Scholastic Achievement

To the extent that gifted students are more emotionally intelligent, they may derive an additional benefit and should obtain better grades at school. In the following passages we review research investigating both ability and trait EI in relation to scholastic performance.

Ability EI and school achievement. Generally, studies have confirmed that ability EI predicts students' grades; this occurs both for broad assessments such as the MSCEIT (Rivers et al., 2007; Zeidner, Matthews, & Roberts, 2009) and narrower measures, such as the *Situational Judgment Test of Emotion Management* (MacCann et al., 2010). This latter study is especially noteworthy as it suggests that the EI measure remains predictive of grades after controlling for both socioeconomic status and general cognitive ability. We will showcase two recent studies that shed still further light on the role of ability EI in academic achievement.

MacCann, Fogarty, Zeidner, and Roberts (2011) developed a contextualized approach to student achievement by assessing coping with school situations (as opposed to general coping style). In their first study, the MSCEIT was administered to 159 US community college students. In their second study, a situational judgment test measuring the emotion management component of ability EI was completed by 383

eighth-grade students at five sites across the USA. In both studies, ability EI predicted GPA, and the effect was mediated by increased usage of problem-focused coping in those high in EI.

The second study by Qualter, Gardner, Pope, Hutchinson, and Whiteley (2012) involved a 5-year longitudinal study in British schools (N = 413). Measures of ability EI, personality, and cognitive ability taken at the beginning of school year 7 (as defined in the British school system) were used to predict academic performance at the end of year 11. Significant correlations between the MSCEIT youth version branch scores and grades on various examinations ranging from 0.13 to 0.28 were found. Not surprisingly, however, cognitive ability predicted grades more strongly than did MSCEIT scores (rs up to 0.55). Structural equation modeling suggested that cognitive ability and EI influenced academic performance independently, although the effect of cognitive ability was much stronger.

Trait EI and school achievement. Numerous studies have examined associations between trait EI and academic outcomes. A meta-analysis of 74 effect sizes (total N = 10,292) found a small but significant average r of 0.20 between trait EI and academic achievement (Perera & DiGiacomo, 2013). The effect size was larger in younger children. Siegling et al. (2015) reported that EI remains predictive of performance with general intelligence statistically controlled. However, confounding of trait EI with personality is a concerning issue.

Direct Research on EI: Academically Gifted vs. Non-identified Students

Proponents of EI have had rather little to say about relations between EI and academic giftedness. Mayer et al. (2001) describe case studies that indicate how emotional giftedness may be distinct from intellectual giftedness, but they leave open the issue of how the two forms of giftedness may be related. However, there is relevant previous research on the emotional and social adjustment of gifted students, dating back to Terman's (1925) pioneering longitudinal study of "genius." In addition to possessing high levels of academic intelligence, Terman's sample proved to be generally well-adjusted with respect to moral development, emotional maturity, and social relationships.

Subsequent studies have generally confirmed this positive view of the social-emotional concomitants of academic ability (see Shani-Zinovich & Zeidner, 2013 for a review). These findings mesh with other results suggesting that superior intelligence is modestly related to positive attributes such as self-efficacy and ego resiliency, as well as reduced vulnerability to delinquency and some forms of mental illness (Austin et al., 2002; Zeidner & Matthews, 2000). Perhaps these social-emotional strengths of the gifted child might be attributed to elevated levels of emotional intelligence.

Next, we look at the scant empirical evidence directly related to EI in the gifted. We begin by addressing several studies employing inadequate research designs, followed by a survey of studies employing an adequate methodology.

Inadequate design. Two studies by Chan (2004, 2007) assessed EI in gifted Chinese adolescents, without including a control group of non-identified students. EI was reported to be inversely related to stress in gifted adolescents, with the effects of EI on stress outcomes mediated by social coping (Chan, 2004). Furthermore, gifted Chinese students perceived greater self-strengths in social skills and utilization of emotions than management of emotions and empathy (Chan, 2007). It is unclear that these findings are unique to gifted individuals.

Lee and Olszewski-Kubilius (2006) examined the self-report (trait) EI of 234 gifted students in grades 10–12, attending summer programs for gifted adolescents. Data were collected on a number of personal variables, including moral judgment, and leadership. The study had no control group, but relative to national age norms, female—but not male gifted students—showed lower trait EI (d = −0.42). Further analyses showed that in both genders gifted students scored higher on adaptability (e.g., confidence in problem-solving) but lower on stress management and impulse control. Moreover, when compared

to the gifted males, the gifted females had higher interpersonal abilities that included being aware of understanding, and caring of others' feelings and emotions. Curiously, correlations computed among measures of academic ability (SAT-Verbal, SAT-Math, and SAT-Combined) and emotional intelligence showed small and statistically insignificant correlations among gifted students. Possibly, correlations were attenuated due to restricted range of ability.

Adequate design. To date, only two studies allow valid comparison between gifted and non-identified students on EI. The first study, conducted by Zeidner, Shani-Zinovich, Matthews, and Roberts (2005), compared academically gifted (N = 83) and non-identified (N = 125) students on both ability-based and self-report measures of EI. The gifted children had been placed in classes for the gifted following the two-stage selection procedure used in the Israeli school system, based on use of aptitude tests beginning in second and third grades. The control group was 125 students from the same school but not assigned to the gifted program. All students completed the MSCEIT (adapted slightly for the Israeli school context), the Schutte Self-Report Inventory (SSRI: Schutte et al., 1998), which is a popular trait EI scale, and a vocabulary test.

The study demonstrated that differences in EI between gifted and control groups turned out to be highly dependent on the measure used. Both measures resulted in meaningful group differences, though in entirely opposite directions. Thus, the gifted group was significantly higher in ability EI, measured by the MSCEIT (d = 0.39), but obtained lower SSRI scores on average (d = −0.57). The effect on the MSCEIT was significant only for the Emotion Understanding and Management branches ("strategic" EI: Mayer, Salovey, Caruso, & Sitarenios, 2003). It was also fully explained by group differences in vocabulary, pointing towards the importance of lexical processing in emotional intelligence.

Curiously, this study reported that when measured using a self-report assessment (i.e., SSRI); EI was actually *lower* for gifted students in comparison with the non-gifted. Based on the social frame of reference model (Marsh & Parker, 1984), the authors suggest that social comparison processes might influence the self-perceptions of gifted students. Perhaps these children do indeed see themselves as set apart from normal social interaction by virtue of being gifted. The transition from being a "big fish in a small pond" to a lesser fish in the pool of gifted children may have adverse effects on self-concept. Second, it is known that the SSRI correlates with personality factors that may differ between gifted and non-gifted groups, such as extraversion and neuroticism (Saklofske, Austin, & Minski, 2003). Also, the negative correlation between SSRI and giftedness may be mediated by insight. Perhaps a high SSRI score in part reflects a rather naive overassessment of one's personal qualities and social skills. If so, gifted children may have better insight into their own personal limitations, leading to lower SSRI scores.

The second study, conducted by Schwean, Saklofske, Widdifield-Konkin, Parker, and Kloosterman (2006), looked at the association between EI and giftedness in 169 gifted Canadian school children in grade 4–8, who were administered the EQ-iYV (Bar-On & Parker, 2000), a self-report measure of EI for youth. In addition, ratings of students' EI by both parent and teacher were obtained. When scores for the total gifted groups were compared with a matched sample (by age and gender) of non-identified children, the non-identified group scored higher on average on their interpersonal abilities, while the gifted student scored higher on the intrapersonal and adaptability scale of the EI-i*:YV.* Furthermore, parents of gifted children tended to rate their children higher on total EI, adaptability and stress management. Self and parent ratings of the advantages of giftedness agreed only for adaptability, perhaps reflecting its dependence on cognitive problem-solving. Schwean et al. (2006) suggested that their findings countered the myth that intellectually gifted children are psychologically vulnerable.

Cultivating and Training EI

Interventions designed to foster EI in the classroom fall under the general rubric of social and emotional learning programs (SEL; Zins, Weissberg, Wang, & Walberg, 2004). These interventions focus on the various processes through which children enhance their ability to integrate thought, emotions, and behaviors to achieve life tasks. Recent research supports the many positive impacts of soundly implemented SEL interventions in the schools on learning and emotional outcomes (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011).

In keeping with the modern "zeitgeist" underscoring the importance of emotion competencies, educators, policy makers, and researchers in the field are now giving serious attention and consideration to the emotional abilities and affective development of non-identified as well as high ability and talented students (Brackett et al., 2009). Furthermore, given the meaningful empirical link between student EI and academic success and well-being it is not surprising that educators have shown an interest in programs and activities targeting the development and training of various EI abilities in child and youth in both elementary and secondary schools. In fact, the implementation of programs that target emotional abilities has become a priority in many schools, with training programs for individuals to become more emotionally intelligent mushrooming in recent years (Zeidner, 2017).

However, a glance at the many EI programs described in the literature suggests that few, if any, have been specifically developed and targeted for gifted children and youth. Yet EI training programs may benefit high ability or talented children irrespective of whether they exhibit emotional or behavioral problems; the emotional development of gifted children should not be neglected. A failure to explicitly target the affective and social components characteristic of gifted and talented students may compromise the actualization of their cognitive potential, social adaptation, and well-being. When emotional problems do arise, it is often due to a misfit between the gifted child's social and emotional needs and the affordances of the child's familial, social, and educational environment, coupled with a lack of nurture and care for the child.

Table 7.1 Tentative guidelines for the development of EI training programs for gifted students

I. Preplanning stage	• Assessing environmental resources and potential support for an EI program for the gifted • Conducting systematic need assessment among target population, including differing sociocultural groups
II. Planning and development stage	• Developing intervention activities based on a coherent conceptualization of EI • Specifying program goals, objectives, and behavioral outcomes • Translating program goals and objectives into specific program activities for various gifted groups
III. Program implementation stage	• Assuring professional development of teachers and program personnel to cater to gifted students of various sociocultural backgrounds • Fully blending and integrating the EI program into the routine classroom curriculum • Providing provisions for practice, feedback, and for generalizing the domain of emotional skills across different classes of behavioral
IV. Program monitoring and impact evaluation stage	• Assuring process evaluation and monitoring of faithful program implementation • Accompanying interventions by systematic impact evaluation

In view of the paucity of EI programs directed at gifted students, Zeidner proposed ten broad and tentative guidelines that may prove useful for developing, implementing, and evaluating EI training programs for gifted students (Zeidner, 2017; Zeidner & Matthews, 2017). These guidelines stem largely from generic program planning and evaluation principles as applied to the development of emotional abilities in gifted students, as well as ideas culled from both the EI and giftedness literature. The tentative program is based on an ability-based model of EI, rather than "mixed" or "personality trait" conception of

EI. Table 7.1 briefly presents the guidelines related to four different phases of the EI training program planning and evaluation process.

It is noted that uncertainties remain regarding designing and implementing EI training programs for gifted and talented students (Zeidner, 2017). These include:

- How we should go about designing training programs tailored to gifted children to be most effective?
- What kind of results we can expect from these training programs?
- To what extent these programs are likely to be more or less effective than alternative types of social and emotional training?
- Which of the components of EI should be emphasized and which are most malleable and responsive to training?
- What type of gifted students may benefit most from training?

One reasonable guiding principle in the designing of EI programs is that intervention programs need to consider and address the specific psychosocial characteristics and distinctive emotional needs of the gifted, to assure appropriate talents are developed. Specifically, EI training programs need to address both the potential risk of gifted students (e.g., specific psychological stressors, low social self-concept, feelings of being different, alienation, competitiveness, socially proscribed perfectionism, heightened sensitivity to others, poor peer relations, and conditional acceptance) as well as key protective factors and mechanisms (e.g., high cognitive abilities, exceptional problem-solving strategies, high academic self-concept, strivings for excellence, grit).

Second, because it is less than clear what kind of results we can expect from these training programs and to what extent these programs are likely to be more or less effective than alternative types of social and emotional training, a comprehensive multi-method assessment should be in place following the intervention, with a variety of impacts assessed, including students' keener awareness and understanding of emotions in self and others, perceived effective emotion regulation, and teacher or student satisfaction with the EI program. The assessment should be particularly sensitive to possible differential effects for ethnic minority and gender subgroups in the population. Furthermore, a major goal of future evaluation research is to compare the effectiveness of specialized EI programs with alternative SEL programs and to test for possible interactive effects between different programs and different subgroups in society (ethnic, SES, gender).

Third, since it remains uncertain which of the components of EI should be emphasized, at this stage, we can only speculate: Whereas certain "source" personal dispositions may be difficult to change (emotional stability, coping styles, etc.), it may be more possible to target "surface" emotional abilities and behaviors (e.g., learning to manage emotions in stressful encounters, understanding antecedent and consequences of emotions).

Finally, with respect to what type of gifted students may benefit most from training, we suggest EI training may be especially valuable to those high ability students who are vulnerable to emotional deficits. Accordingly, for those gifted students who evidence troubling social, emotional, or interpersonal behaviors, the EI construct offers a potentially useful conceptual framework to assist in designing helpful therapeutic interventions. Future training programs might target selected vulnerabilities attributed to gifted students, such as feeling alienated from typical children, maladaptive coping with stress, and threats to academic self-concept associated with big-fish-little-pond (BFLP) effect (Zeidner & Schleyer, 1999). The BFLP effect suggests that the academic self-concept of gifted children is depressed when they are enrolled in homogeneous classes for the gifted compared to heterogeneous classes. Only experience with EI program implementation and evaluation would serve to answer these questions.

In addition, the program planner needs to keep in mind that gifted children are heterogeneous in emotional functioning. Some gifted children will be resilient, prosocial and well-adapted to the

classroom whereas others will not. Indeed, while there are various sources of underachievement in gifted students, one important source of poor classroom achievement is maladaptive self-regulation and motivation (McCoach & Siegle, 2003). Furthermore, giftedness may be associated with subtle forms of emotional maladaptation, or with emotional challenges in specific domains, such as isolation from peers in high school (Vialle, Heaven, & Ciarrochi, 2007).

In view of the above, we currently need better studies of the efficacy of interventions designed to enhance the specific competencies involved in EI. This does not mean stories about the effectiveness of a particular programs process evaluation or documentation that such programs are enjoyed by program participants. What is required is the kind of controlled experiment with random assignment to a well specified EI intervention or to a comparison group that presents a credible alternative (e.g., drug prevention program) with follow-up over a period of at least several months and criterion measures that include both soft and hard outcome variables. This is the kind of evaluation that that may convince skeptics, especially if it includes hard-headed, cost-effectiveness modeling.

Challenges, Fissures, and Caveats

A number of challenges and fissures involved in the training of emotional skills and abilities in gifted students have implications for the design and implementation of EI training programs. First, given the relative stability of personal traits such as EI and deeply entrenched coping styles, we should not expect EI training to yield rapid changes in gifted student participants. Developing emotional skills takes considerable time, and energy, requiring deliberate effort, repeated practice, and systematic feedback in varying contexts in order to change deeply engrained traits. As noted above, whereas certain "source" personal dispositions may be difficult to change it may possible to change "surface" emotional skills, abilities, and behaviors. Also, EI training can do much to raise awareness about the importance of emotional skills and motivate gifted student to learn from their everyday emotional experiences. Schools may also reap short-term benefits if training programs instill in gifted and talented participants a sense of personal growth and motivation contributing to a positive classroom atmosphere.

Second, it is crucial to take individual differences, diversity, and situational factors into consideration when planning EI programs for the gifted. There are numerous ways people can manage their emotions and handle interpersonal challenges. What works for some gifted people may not work for gifted coming from diverse ethnic and SES subgroups. Likewise, what works in some situations (classroom) may not work in other circumstances (on the basketball court or on a date). This suggests that in training emotional skills, we should respect individual and sociocultural group differences, be sensitive to the social or environmental context, avoid simplistic recommendations, and strive to broaden people's coping resources rather than drill a narrow set of skills.

Third, although many of the currently employed EI programs are promising, few have been systematically modeled upon EI or designed in a way that is likely to lead to long-term change. One-day seminars or workshops can be valuable in educating people about emotions and raising emotional awareness, but they may not by themselves lead to the kind of reprogramming that is required for significant improvement. Thus, it is critical for psycho-educational researchers to continue to establish evidence-based strategies that educators can effectively implement for the gifted.

Conclusions

Contrary to popular myth, gifted children are not, in general, emotionally dysfunctional. However, some gifted children, and particularly the profoundly gifted and the gifted with coexisting disabilities, may face social-emotional challenges. Research on EI may help to elucidate emotional functioning in gifted individuals, and

suggest avenues for remedial interventions where appropriate.

There is a solid conceptual basis to predict that cognitive intelligence and emotional intelligence, conceptualized and assessed as an ability, are moderately correlated. Our review of the empirical literature broadly supported these predictions. Also, our review showed that trait EI is reliably related to scholastic achievement, whereas the empirical data point to very low and inconsistent associations between trait EI and cognitive ability. Furthermore, studies comparing EI in gifted and non-identified students are rather ambiguous and in need of replication and further research on larger samples.

The gifted field is increasingly recognizing the importance of understanding how to better promote states of excellence among talented youth (Lubinski & Benbow, 2000). Further work is needed to achieve an in-depth understanding of the socioemotional characteristics of gifted students and to find ways of tailoring curricular activities and academic demands of gifted students to match their level of emotional maturity and social competence. Interventions designed to enhance emotional learning are now a major focus for education, but they have tended to neglect the needs of the gifted child. Future training programs might target vulnerabilities such as feeling alienated from typical children, and threats to academic self-concept associated with BFLPE. Interventions may also be tailored to the particular needs of underachieving gifted students.

Although many gifted children may not, in general, have a particular need for EI training, it is reasonable to expect that the judicious application of empirically supported psychoeducational strategies to promote El would help gifted children develop emotional skills and may yield benefits that accrue over time. EI training may help students improve their emotional and social functioning, learn new or improved emotional competencies, and understand and manage their emotions better. Also, EI training may help support the optimal development of talent and student well-being in its various forms and expressions and have important implications for gifted education.

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Gender and Talent Development of Gifted Students

8

Barbara A. Kerr and Jonathan M. Huffman

Abstract

For most of the history of the psychology of talent development, gender was simply construed as a binary construct based on the biological aspects of sex characteristics. Although gradually psychologists began to distinguish between biological sex and gender role, the socially constructed ideas of behaviors appropriate to male and female sex, it is only more recently that gender has been considered as a nonbinary complex. Therefore, this chapter presents gender on a continuum and will provide an overview of gender development in gifted students. Furthermore, the chapter detail issues specific to self-identified girls, self-identified boys, and LGBTQ gifted students. It should be noted that in the gifted education literature, biological sex is used almost exclusively; therefore within the context of this chapter we attempt to clarify that biological sex is not all encompassing. Suggestions for psychologists working with gifted students are presented.

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For most of the history of the psychology of talent development, gender was simply construed as a binary construct based on the biological aspects of sex characteristics. Although gradually psychologists began to distinguish between biological sex and gender role, the socially constructed ideas of behaviors appropriate to male and female sex, it is only more recently that gender has been considered as a nonbinary complex (Steensma, Kreukels, de Vries, & Cohen-Kettenis, 2013). The recognition that sexual orientation as gay, lesbian, or bisexual only describes attraction rather than identity has been highlighted by the upsurge in individuals identifying as transsexual, that is, having a core identity as male or female that differs from biological sex (Galupo, Davis, Grynkiewicz, & Mitchell, 2014). Psychologists serving gifted students should attempt to carefully distinguish among these concepts as they survey the literature, rather than assuming that studies using biological sex as a variable reflect the actual complexity of individual talent developing within gendered contexts (Kerr & Multon, 2015). In addition, the fact that many parenting and educational practices are gendered means that psychologists need to help their clients to understand how their upbringing and education has limited or expanded their choices.

The gifted education and psychology of gifted literature is itself gendered. For example, the failure of gifted women to achieve eminence was simply accepted without question by Terman and

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Oden (1935) in their follow-up studies of gifted children. Sex differences studies have been given prominence in the literature, and abilities found to be higher in males were given disproportionate emphasis. Hyde (2014) described how the "mathematics gap" was investigated intensely—until it disappeared Mathematical precocity was studied thoroughly in longitudinal studies, while verbal precocity, where females have a moderate advantage, has languished in the gifted education literature (Kerr & McKay, 2014). Intense interest followed a few studies of sex differences favoring males in spatial-visual rotation, despite the fact that these abilities may be quite malleable (Uttal et al., 2013). Eminence studies seldom include female-dominated fields, while physics, architecture, and philosophy are considered to be fields that require "genius" (Leslie, Cimpian, Meyer, & Freeland, 2015).

Adding to the complexity of development of talent in the context of gender, all other forms of social status interact with gender to affect gifted students. Race, ethnicity, ability status, language, geographical origin, religion, and age all interact with gender; these interactions lead to lesser or greater distance from privilege (Kerr et al., 2012). Although research in the field of gifted education explores issues affecting Black, Asian, Hispanic, and Native American gifted children, few address intersectionality—that is, the interactions gender, race, socioeconomic status, sexual orientation, and other differences. With inequality growing throughout the USA and the world, and the continuing oppression of racial, sexual, and religious minorities it seems important that the construct of distance from privilege be considered along with intellectual abilities and psychological factors in predictions of achievement and eminence. A more comprehensive review of the literature in *Smart Girls in the Twenty-First Century* is based on a model of female talent development as the interaction of abilities, personality, passion, and privilege (Kerr & McKay, 2014).

In this chapter, giftedness is defined as potential for exceptional achievement or eminence in a domain (Subotnik, Olszewski-Kubilius, & Worrell, 2011). Gender identity is the subjective sense of one's maleness or femaleness (Johnson & Wassersug, 2010). Sexual orientation refers to the direction of one's sexual attraction, generally categorized as gay, lesbian, or bisexual. Gender role is defined as the expectations of a society about the proper behaviors for a male or female (Eagly, 2013). Gender relations are the attitudes and behaviors of gender roles that shape social relations (Ridgeway, 2009). Transsexual refers to having a core identity as male or female that differs from biological sex (Galupo et al., 2014). This term is often used when the individual wishes to transition from male to female or female to male. Transgender also refers to having a gender identity that differs from biological sex at birth. It is a broad term that is appropriate for non-transgender people to use. "Transgender is correctly used as an adjective, not a noun, thus 'transgender people' is appropriate but 'transgenders' is often viewed as disrespectful" (National Center for Transgender Equality, 2014). Each of these has an impact on how giftedness is perceived and developed. Distance from privilege is defined as the distance that an individual must travel to reach the center of power in any domain, in terms of overcoming such barriers of gender, race, class, age, and citizenship.

This chapter respects all gifted students self-identified gender identity and attempts to present gender on a continuum to best represent all persons. We have included a section on LGBTQ gifted students due to the unique social stressors these students experience. However, it is important to note some gifted students who identify with a gender in contrast to their biological sex may refuse to label themselves as transgender. Instead, these gifted students may choose to simply identify with male and female, instead of trans-male and trans-female. The authors validate gifted students' choice to identify as male and/or female, with refusal to identitfy with a transsexual/transgender, and have included an LGBTQ section for reference by psychologists and those who identify with transgender/transsexual identities. It should be noted that in the gifted education literature, biological sex is used almost exclusively; therefore we will

attempt to clarify that biological sex is not all-encompassing.

The Development of Gender Identity, Role, and Orientation in Gifted Students

Gender identity is considered to be a spectrum of beliefs and emotions about one's maleness or femaleness (Eagly, 2013). Gender identity has developmental stages paralleling cognitive development. Toddlers (ages 1–4) have a fluid gender identity without a strong sense of masculinity or femininity. This indifference gives way to gender rigidity in early childhood (about ages 4–7), when both boys and girls strictly enforce gender rules. Young children read only superficial clues to gender, thinking that it is their clothing or toys that make them boy or girl. As a result, they strongly resist any attempts to get them to play or dress in ways that do not match what they perceive to be "boy" or "girl." In later childhood, the mature identity can form as children begin to understand that their biological sex is stable.

Gifted students' gender-related behavior often differ from those of their same-sex peers; a frequently cited study is Terman and Oden's (1935), who identified children by biological sex. They found that gifted girls are more like gifted boys than like average girls in their interests and activities. As a result, gifted girls, even though they self-identify as girls, may be more androgynous. They have an early awareness of sexism and reject the second-class status of the female gender role (Kerr, 1997; Kerr & McKay, 2014). Very young gifted girls (3–4) may proclaim that they are boys during their play activities. Psychologists need to distinguish if little gifted girls claiming to be boys are expressing trans identity or doing so in order to achieve what they consider to be more freedom or higher status. Being Batman is just much more interesting than being Batgirl. The treatment in the media of boys and girls continues to promote stereotypes, as Orenstein (2011) has documented. Sex-segregated clothing, toys, and media are often the only products available to gifted children. Pink, sparkly clothing and pink, pretty toys that emphasize nurturing dominate "girls" aisles of stores, while monsters, weapons, and machines dominate "boys" aisles. Gifted school age children usually take their cues from similarly aged peers (Shepard, Nicpon, Haley, Lind, & Liu, 2011). Peers caught up in sex-segregated clothing and playthings may put pressure on gifted children to conform. If, however, they have alternative toys, books, and media, they may be likely to create their own unique approach to being a boy or girl.

Later on, as adolescents, gifted self-identified girls' extensive reading leads them to rebel against female identity in more complex ways as they learn more about females' second-class status in many cultures (Kerr & McKay, 2014). While gifted self-identified girls are more like gifted self-identified boys in their interests and aspirations, they experience the same socialization as average girls, leading often to role conflict in adolescence as they attempt to fulfill both the social directive to be achieving as well as the social directive to behave in feminine ways.

Gifted self-identified boys also struggle with gender identity issues when they prefer creative activities to activities prescribed for males such as sports and interest in video games. They may fear that loving art, music, and drama may mean that they are not masculine enough (Kerr & Cohn, 2001). There is some evidence that the millennial generation of adolescents and young adults regard gender identity and sexual orientation as much more fluid and changeable than previous generations (Galinsky, Aumann, & Bond, 2013). This may mean less pressure on creative boys to prove their masculinity by the avoidance of creative activities. One of the most striking differences in millennials is their tolerance for and acceptance of a wide variety of gender identity/sexual orientation combinations (Twenge, Sherman, & Wells, 2016). Parents who are homophobic or anxious about gender identity may discourage androgynous or opposite sex interests; however, most of the American public is moving in the direction of greater tolerance for

diverse sexual orientations and gender identity (Hans, Kersey, & Kimberly, 2012).

When considering the most common definition of gifted students within the USA (i.e., those students who are enrolled in gifted programs) and lesbian, gay, bisexual, transexual/transgender (LGBT) populations (i.e., those who self-identify their sexual orientation and/or gender identity as LGBT), it is estimated there are 260,000 gifted LGBT students in the USA (Fredericks, 2009). Yet the above projection may be limited because it only encompasses gifted students who have identified their sexual orientation and gender identity and fails to account for students whohave not yet publically presented their LGBT identity. Furthermore, this estimate fails to account for the plethora of students who choose not to conform to a sexual orientation and/or gender identity label on the sexual orientation and gender identity continuums, suggesting that this number may be larger than presented.

Issues for Self-Identified Gifted Girls

In the studies contained below the authors utilized participants' self-report to assign sex. The participants in these studies were only given binary choices of sex and failed to address gender identity separately. It is important therefore, to understand that these studies may contain gender nonconforming participants and participants may have identified as a gender nonconforming student if given the opportunity. The authors' designation of "girls" and "boys" will be used.

According to many studies, girls outperform boys in the acquisition and use of verbal information, and this begins even in the early years as girls pick up the meaning of words and try to use them appropriately (Hyde & Linn, 1988). Gifted girls are also often advanced in their ability to learn languages; however, girls who speak less privileged languages in the home, especially Latinas, may not have their bilingualism noticed as a talent. Given gifted girls' superior development of verbal fluency compared to boys (Hyde, 2014), learning a second language in early childhood may be particularly important for girls.

Gifted girls are more likely to read early (between 3 and 5) rather than at the average age (between 5 and 7), and intellectually gifted girls are even more likely to read precociously (Lovas, 2011). Precocious reading does often indicate giftedness. Stainthorp and Hughes (2004) note that it is wrong to assume that any child who is reading at age 3 or 4 is just memorizing or decoding words without comprehension. Unfortunately, myths about reading precocity have often led school administrators to ignore early reading as a sign of giftedness in girls (Kerr & McKay, 2014).

Much has been written about development of talent in mathematics (Richardson & Benbow, 1990; Rotigel & Fello, 2004). Unfortunately for gifted girls, math ability may be less noticed by parents and teachers because of common stereotypes and myths about sex differences favoring boys (Jacobs & Bleeker, 2004). For boys, it is too often assumed that early ability in mathematics constitutes interest in mathematics, and even at a very early age, boys may be steered in the directison of science and math even when their own interests and preferences lie in other areas. Early admittance to kindergarten may be the best option for challenging gifted girls, who are usually advanced in emotional and social development (Colangelo, Assouline, & Gross, 2004; Gagné & Gagnier, 2004).

As has been found throughout generations, from Terman (1981) to Kerr and McKay (2014), the interests, aspirations, and play activities of gifted girls are more like those of gifted boys than they are like those of average girls. Gifted children of both sexes tend to be androgynous in their interests and activities. Highly gifted and creative girls sometimes face rejection from other children because of their unusual interests—and this may lead to a gifted girls preferring solitude. It appears from the few studies of very young gifted girls, however, that most of them manage to combine their adventurous, problem-solving, exploratory activities with more traditionally feminine play interests as well (Kerr & McKay, 2014).

The gifted girl needs opportunities to transcend the rigid gender categories when she is ready, and non sex-typed toys need to be available. In school, gifted girls may draw less attention to themselves (Kerr & Cohn, 2001) becoming invisible in the classroom.

Because gifted girls are socialized to value popularity, friendship, and gregariousness more than gifted boys, they often are pressured to play with others when they prefer to be alone (Kerr & McKay, 2014). Solitude for gifted girls provides time for imaginative play, engagement with nature, and the friendship of books. Scholarship and creativity require a high tolerance for being alone, and it is in childhood that girls are most likely to learn the skills of solitude.

Finally, for many gifted girls, books are considered their best friends. Voracious reading in early childhood is a characteristic of most eminent women (Kerr & McKay, 2014). Access to reading material in books through early membership in a library and material on the Internet provide girls with ways to explore the world in a self-directed way during alone time.

Adolescent girls have now caught up and surpassed boys in achievement in many academic domains, and score similarly in self-esteem (Hyde & Mertz, 2009). Gifted girls, however, still lack confidence in their intellectual abilities compared to gifted boys. David Yun Dai (2002) reviewed the literature on gifted girls' motivation for achievement and concluded that despite the advances in gifted girls' achievement, significant work needs to be done if they are to fulfill their potential. For gifted girls, who are advanced both intellectually and socially, middle school may represent a stressful period of boredom and frustration. Although girls in general like collaborative learning, the favored method of teaching in middle school, gifted girls may dislike the way they often end up doing most of the work (Ramsay & Richards, 1997). Gifted girls are less likely to take advantage of programs for middle schoolers such as the Talent Search if they are not confident in their abilities and may be more reluctant than gifted boys to take academic risks (Brody & Mills, 2005).

Skipping high school entirely may be a viable option for gifted girls, according to the authors of a study of the long-term impact of early college entrance and special guidance on girls (Solow & Rhodes, 2012). Many parents and even the girls themselves had trepidations about skipping high school and going straight to college. This radical acceleration, according to the authors, turned out to be effective in providing highly gifted young women development of their intellect and a feeling of a proper fit in the world; the specialized guidance and strong community supported their development.

Currently, it is the specialized secondary schools, "exam schools," and residential high schools for gifted students that provide maximum opportunities for the development of talents. When opportunities are available, most academically talented gifted girls will maintain high academic achievement as well as hold leadership positions in school activities (Mendez, 2000).

Where once adolescent gifted girls fell behind gifted boys in their career aspirations, they now continue throughout high school to have high aspirations, planning for college and beyond while in high school. Given proper guidance, they know that they can strive for medical school, law school, and graduate school. Retrospective studies of gifted women who made early decisions about college found they had fulfilling career goals, significant relationships, as well as greater life satisfaction; they also reported being happy, proud, and satisfied with their relationships as well as with their financial success (Perrone, Perrone, Ksiazak, Wright, & Jackson, 2007).

In poor communities and underfunded schools, gifted girls are exposed to low expectations held for their peer group. Studies of talented at-risk girls, as well as studies of high-achieving minorities, showed that the adolescent gifted girls who had strong support of their families, who were provided with homes and safe out-of-school environments, and who were engaged in church and community activities were likely to survive and even thrive (Kerr & Robinson-Kurpius, 2004). In African-American communities, the churches provided safe places

to interact with both teens and adults and often offered musical and leadership activities that were missing at school. In many low income communities, strong athletic involvement provides not only a safe place but also a chance to stay healthy and strong. Athletic activities are a protective factor in reducing teen pregnancy, substance abuse, and exposure to violence (Johnson, Roberts, & Worrell, 1999). For Hispanic girls, the extended family is a safety-net factor; for Native American communities, tribal involvement provides a strong sense of identity and pride that protects gifted girls against threats to their self-esteem.

Too often, the only gifted education programs available to bright students in high school are Advanced Placement (AP) and International Baccalaureate (IB) courses and Honor Societies. These programs amount to a "narrow escape" from boredom and social competition in high school culture (Hertberg-Davis & Callahan, 2008).

Fewer girls than boys enroll in AP courses for Calculus, Physics, Computer Science, and other physical sciences that might be offered. Many theories have been proposed, and much research has been done, but it appears that by junior year, girls often feel like that they do not have a place in those classes. In many ways, computer science and coding for software are the new "math filter" that filter young women out of opportunities for highly paid and highly desirable occupations.

Popular culture and advertising teaches young girls and boys many false illusions about sex and sexuality. Puberty comes earlier for post-millennial girls than previous generations (Shriver, 2009) and early onset of sexual intimacy may make eminence in one's field less likely (Csikszentmihalyi, 2009). Most gifted girls will eventually be in long-term relationships, and many will have dual-career marriages. Relationships in high school should prepare gifted girls for dual-career lives, egalitarian relationships, and shared domestic tasks; relationship education should help gifted girls to resist unrealistic expectations for romance and sexuality.

Friendships can be just as difficult as romantic relationships for smart girls. They may have few friends who are as bright as they are or lack a peer group that is achievement oriented. Johnson et al. (1999) suggested that girls are often engaged in a struggle with other girls about what femininity is. If a gifted girl's idea of femininity deviates too much from that of her peer group, she may be bullied. As a result of negative reactions, talented girls often develop "thorns and shells" in their personalities as boundaries to protect themselves from social scrutiny (Kerr & McKay, 2014). Thorns can manifest themselves by way of sarcasm, intolerance, self-righteousness, brusqueness, or simply having a sharp tongue. On the other hand, a gifted girl can form a shell by wrapping herself in shyness, timidity, and modesty (Kerr, 1997).

For smart self-identified girls who have a questioning, bisexual, or lesbian orientation, the process of identity development is fraught with difficulty. Because many gifted girls are androgynous, that is, having as many traditional "masculine" behaviors as "feminine" behaviors, they may receive confusing cues from others or direct questions about whether they are heterosexual, bisexual, or lesbian. Lesbian gifted girls generally begin to wonder about their orientation around eighth grade, but according to one study, they are fairly sure of their orientation by 11th grade (Peterson & Rischar, 2000). While in high school, many have passed through the stages of wondering, denial, or defensive masquerading to the eventual acceptance of their orientation. Gifted lesbians must negotiate how, when, and even whether to come out to their parents and peers, which happens more often in high school than it used to. Even in schools that have a culture promoting equality and tolerance, bullying and verbal cruelty are real dangers.

Millennial adolescent girls suffer from greater stress and higher levels of anxiety than boys, and gifted adolescent girls are at risk of being overwhelmed (Shriver, 2009). Intelligent girls are often multipotential—that is, they have the capacity to excel in a wide variety of domains and activities—and may suffer from too many options. Girls with less privilege have part-time

jobs and family responsibilities, in addition. Eating disorders seem to affect gifted girls disproportionately, particularly those gifted girls in dance, performing arts, and individual athletic training.

The capacity to make a connection with a master teacher is critical for gifted girls, particularly those with specific, advanced abilities. Eminent individuals have had at least one teacher who challenged them to achieve their full potential, held extremely high expectations, developed the student's technical skills and knowledge base, and provided access to the student's future profession (Bloom & Sosniak, 1985). The strengths necessary for a continuing bond with the master teacher are a "thick skin," a desire to prove oneself worthy, and willingness to show consistent and sustained effort (Kerr, 1997). Kaufmann and Matthews (2012) found that having a mentor was associated with higher salary and status for female Presidential Scholars throughout their careers.

Issues for Self-Identified Gifted Boys

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Gifted boys from privileged families (i.e., with access to resources and other forms of power) are assumed by numerous educators to have the ability to succeed on their own. While this remains true for numerous accomplished men (Lubinski & Benbow, 2006), some men are lost in transition (Kerr & Cohn, 2001). In fact, numerous intelligent boys are restricted from achieving their potential by gendered practices in education and society (Hartley & Sutton, 2013).

For gifted self-identified boys, misguided delay of early education is a frequent issue. Kindergarten redshirting continues to be on the rise (Frey, 2005) though there is little evidence of its benefits. Parents and educators are often misguided by holding self-identified boys back a year at the start of their academic career. In fact, parents often believe that they are helping the student by allowing the boy the opportunity to physically and socially develop. However, holding gifted boys back an additional year puts them 2 years behind their initial placement. This decision can lead smart boys to be out of step and bored throughout their academic career (Kerr & Cohn, 2001). In an attempt to avoid this, learning disabilities and clear social and emotional disorders are the only rationales that should be considered when contemplating kindergarten redshirting smart boys (Colangelo et al., 2004). Psychologists should attempt to educate parents, teachers, and administrators of the potential negative consequences associated with holding bright young boys back a year. In contrast, intelligent young boys who demonstrate signs of giftedness should be allowed to enter kindergarten. Smart boys who demonstrate early reading, early mathematical skills, or score highly (first or second grade level) on the out of level standardized achievement test are good candidates for early placement.

From a young age gifted boys are forced into societal expectations of gender appropriate toys. They are often restricted to "boy" toys such as cars and tools. However, young gifted boys may express themselves through more androgynous toys and creative outlets. Yet, society continues to push back with aisles of toys for "girls" and "boys" and a limited selection of non-gender based options. Psychologists should support young gifted boys' interest in all toys and creative outlets regardless of gender role expectations.

These societal expectations continue throughout development for bright boys and may influence their interests and gifted expression. In fact, high school boys who identify with masculine role models may refrain from joining in activities that are girl-led or girl-dominated such as yearbook, theater, and show choir (Kerr & Cohn, 2001). Due to the strength of gender roles gifted boys are socialized to these societal expectations and often underachieve as a way of proving their masculinity to friends (Kerr & Cohn, 2001) while fitting the "acceptable" mold of masculinity. Psychologists should question gifted boys who drop out or decline involvement in school activities to determine if the student is limited by economic need or the negative stereotypes and social repercussion regarding male engagement in "girl activities." Though gifted boys may appear disengaged in school, they are likely passionate and engaged in an area which matches their creative interest such as rock band, robotics, animation, or creating apps (Kerr & McKay, 2013). Therefore, parents and psychologists need to discuss with gifted boys their involvement in nontraditional academic activities. Numerous gifted boys fail to recognize their creative accomplishments and should be encouraged to list their hidden projects in their portfolio or resume.

Boredom may also present itself as underachievement or disengagement in gifted boys. For example, failure to turn in homework or participate in class may signal boys' boredom and disengagement within the academic environment. In fact, boys have consistently demonstrated across research studies their increased tendency (at a factor of 2–3; Matthews & McBee, 2007) to underachieve when they are bored in comparison to girls. In addition, boys may appear to be underachieving with female teachers who favor girls' ways of interacting in the classroom. Boys, especially white boys, who act more like girls in their compliance with assignments, participation, and interaction tend to receive an increase in grades from their teachers (Cornwell, Mustard, & Van Parys, 2013). However, gifted boys who act out their boredom through disengagement and underachievement are at risk for misdiagnosis with a variety of mental health disorders (ADHD, bipolar, conduct disorders; Webb, 2009). Psychologists should advocate for gifted boys by working with parents and medical providers to avoid misdiagnosis. Furthermore, before a diagnosis of ADHD is applied psychologists should advocate for acceleration options such as in-class differentiation, grade-skipping, and out-of-school opportunities for advanced work (Colangelo et al., 2004).

In contrast to boredom, gifted boys may have the desire to be high achieving, while outwardly appearing to be underachieving, due to incongruence with educational instruction, preferred learning styles, and gifted areas. A unique problem for gifted boys who are gifted in spatial reasoning occurs when their unique abilities in spatial reasoning get them placed in gifted education programs and classes which emphasize verbal and mathematical curriculum and skills (Kell & Lubinski, 2013). Underachievement and disengagement could be a reflection of education that fails to tap gifted boys unique spatial abilities.

Hébert (1995, 1996, 2001) has used qualitative studies to explore the needs of adolescent boys in high school academics, in athletics, and peer groups. A theme throughout his observations has been the importance of image management to gifted boys. He documents the tendency for creative boys who self-identify as heterosexual males to avoid expressing creative interests and to deny creative achievements in order not to appear feminine. In addition, Hébert's studies show the increasing pressure on high school boys to conform to masculine ideals of athleticism, dominance, and avoidance of feminine activities.

College preparation for gifted boys is essential due to the variety of careers for which bright boys will aspire and the planning associated with these careers for success. The need for college preparation in gifted boys is apparent due to the tendency for parents to spend more time with girls discussing college career paths, planning, and the lack of discussion related to college preparation amongst their peers (Wells, Seifert, Padgett, Park, & Umbach, 2011). In fact, minority and low SES boys were less likely than girls to seek or receive social capital that leads to college

attendance irrespective of their ability. Gifted boys who fail to discuss college preparation may miss out on application deadlines, qualifying exams, and scholarships.

Hébert's studies of boys of color, including Latino (1996), African-American (1998), and Asian gifted boys (2001), describe how gifted young men of color struggle with identity development in both the case of low societal expectations for Latino and African-American achievement and high societal expectations for Asian-American boys. In both cases, boys who do not conform to society's biases must learn ways of expressing their own unique needs, interests, and values. To assist gifted boys in high school, Hébert suggests bibliotherapy in which books featuring models to which boys can aspire as well as the strong involvement of male mentors.

Gendered education and gender roles are so strong that in comparison with girls, gifted boys are limited in their opportunities to discuss relationships with peers and adult confidantes (Kerr & Cohn, 2001). In fact, gifted boys may confuse relationships with achievement causing them to view and choose their relationships based on what is socially considered an "A" girlfriend. Gender roles also encourage boys to focus on careers instead of relationships. Yet, most gifted boys will eventually become members of dual career couples (Xie & Shauman, 2003). Gifted boys need career counseling which will provide insight on what their future might hold for them in a relationship and career. Specifically, educating gifted boys on relationships in which both partners are employed or the female is the breadwinner will be more consistent with predictions of marriage and careers in the next decades (Wang, Parker, & Taylor, 2013).

Young gifted questioning, bisexual, and gay self-identified boys may have additional difficulty in their identity development. Due to the tendency for gifted boys to be androgynous, that is, having as many traditional "feminine" behaviors as "masculine" behaviors, they may be confronted with direct questions and confusing cues about their heterosexual, bisexual, or gay status regardless of their sexual orientation. During high school gifted boys may pass through the stages of wondering, denial, or defensive masquerading before arriving at the acceptance of the orientation. In addition to trying to understand their sexual orientation themselves, gifted boys must also decide how, when, and even whether to come out to their parents and peers.

Issues for LGBTQ Gifted Students

Gifted students often feel socially different than their peers and report feeling stereotyped and stigmatized. Lesbian, gay, bisexual, transsexual/transgender, and questioning (LGBTQ) gifted students may further feel stereotyped, stigmatized, and even unsafe due to the societal expectations around sexual orientations and gender identities. The Gay, Lesbian, and Straight Education Network (GLSEN) National School Climate Survey (2015), which contained 10,528 LGBTQ youth from ages 13 to 21 in all 50 states, stated 57.6% of LGBTQ youth reported feeling unsafe due to their sexual orientation, 43.3% reported feeling unsafe due to their gender expression, and 22.3% reported feeling unsafe due to their academic ability or how well they performed in school. Due to their sexual orientation and/or gender identity 85.2% of LGBTQ youth reported a previous history of verbal harassment, 48.6% reported previous cyber bullying, 34.7% reported previous physical harassment (e.g., pushed or shoved), 13% reported previous physical assault (e.g., punched, kicked, and/or injured with a weapon) at school based on sexual orientation, and 9.4% reported previous physical assault at school based on how they expressed their gender (GLSEN, 2015). Compounding the situation, 57.6% of LGBTQ students stated they never reported their experiences of victimization to school staff, were afraid of being "outed" to their family by school personnel (41.3%), and reported that they believed staff members would not respond to the reported circumstances effectively (64.3%; GLSEN, 2015). This is a concern for gifted students in particular because giftedness has been associated with androgyny and other

nonsterotypical gender based behaviors. This may cause gifted students who identity as heterosexual to experience similar bullying, harassment, and discrimination as their LGBTQ gifted counterparts. Therefore, psychologists should discuss gender identity, gender role, and gender relations with all gifted students regardless of LGBTQ minority status.

Students who are both gifted and a member of the LGBTQ community (*twice different*) may experience unique stressors that can lead to depression and isolation (Levy & Plucker, 2003). For example, as gifted students they must deal with the intellectual deviance from the mainstream culture and their social networks while also managing the stigmatization of their sexual orientation and/or gender identity. Cross (1997) noted gifted students might mediate or attempt to control the information available to their peers related to their giftedness through both visible and invisible methods. For example, gifted students may hide their abilities by failing to answer questions and presenting themselves as unprepared (invisible). In contrast, gifted students may attempt to stand out and display their giftedness by presenting themselves as distinctly different from their typical peers through a variety of mediums (visible).

Similarly, LGBTQ gifted youth may mediate or attempt to control the information available to their peers related to their sexual orientation and/or gender identity through both visible and invisible methods. For example, LGBTQ gifted youth may hide their sexual orientation and/or gender identity by conforming to societal norms, dating partners which do not match their attractive interest (Kerr & Cohn, 2001), and/or a denial of their true LGBTQ self in fear of public retaliation or social losses (invisible). In contrast, some LGBTQ gifted youth may challenge societal norms and display their sexual orientation and gender identity through healthy and creative modes of expression along with social involvement in organizations such as Gay-Straight Alliances (visible). However, some students abilities related to their giftedness make them acutely aware of societal norms and expectations. Therefore, some gifted students may over exaggerate their gender nonconformity or flamboyance to match their perception of how LGBTQ people are "supposed" to act (Peterson & Rischar, 2000). Emphasis on either side of the continuum of giftedness, sexual orientation, and gender identity (invisible vs. visible) during development may limit students from developing their own authentic view and self in each of these categories. For the student who is both gifted and a member of the LGBTQ community, they must constantly manage all of these identities (e.g., gifted identity, sexual orientation, and gender identity) and determine, on an individual basis, the safety of revealing them to their social network of friends. The ability to hide these traits is a unique aspect of both gifted and LGBTQ students in comparison with other minorities, which do not have the option to conceal their status as a minority member.

While tolerance for a more diverse society related to sexual orientation and gender identity continues to grow in the USA (Hans et al., 2012), there is continued need for research that strives for equality and understanding, within LGBTQ gifted populations. Specifically, minimal research has been conducted on LGBTQ gifted students and research should work to further distinguish similarities and differential effects between sexual orientation and gender identity for gifted students, specifically. Many of the stereotypes and socially held beliefs around lesbian, gay, and bisexual individuals are based in gender expression and associated behaviors, not in sexual orientation itself. Furthermore, gender presentation is often the platform for which harassers judge individuals due to its outward visibility, while sexual orientation is not something which is outwardly discernable (Wilkinson & Pearson, 2009). Perpetuating the confusion between orientation and identity, sexual orientation and gender identity are typically grouped together within a singular study. While this is often warranted due to sample size and limited participants, researchers, teachers, and psychologists working with gifted students should be careful not to assume these individuals have similar experiences. In fact, the complexity of the interaction between sexual

orientation and gender identity should be respected for each gifted child individually (e.g., A high school gifted student who is biologically born male, gender identified as female, and attracted to males [straight]). Detailed research drawing attention to sexual orientation and gender identity for gifted students will assist psychologists in understanding the diverse needs of this population.

LGBTQ gifted students have noted alarming rates of harassment (GLSEN, 2015) and have reported feeling isolated and stigmatized during their middle and high school experiences (Hutcheson & Tieso, 2014). Furthermore, a disturbing number of LGBTQ gifted students have reported feeling unsafe within the learning environment (GLSEN, 2015). Yet the state and local legislation pertaining to the protection of LGBTQ students varies greatly (Friedrichs, 2014), often leaving LGBTQ gifted students and their advocates with few legal protections. For example, some legislation protects LGBTQ students, and the educational staff that support them, while other legislation condemns the mention and acceptance of LGBTQ identities in schools. An awareness of state local legislation regarding LGBTQ gifted students along with knowledge of local resources that advocate for underserved LGBTQ adolescents is essential. Furthermore, advocating in the direction of equality for all underserved groups, including LGBTQ gifted students, at local, state, and federal levels of government is encouraged. Sharing information regarding local, state, and federal levels of government pertaining to LGBTQ rights with LGBTQ gifted students, and their families when applicable, may be a positive way to increase engagement in social advocacy and introduce LGBTQ gifted students to similar persons.

It is imperative for psychologists to actively address heterosexual and cisgender privilege in their work. LGBTQ gifted students have described their school environment and extracurricular activities as heteronormative due to their tendency to unconsciously reinforce heterosexuality and failure to acknowledge the existence of other sexual and/or gender identities (Schilt & Westbrook, 2009). In fact, straight privilege has been documented to make LGBTQ gifted persons feel different and isolated from their peers (Hutcheson & Tieso, 2014). Psychologists must be active in their efforts to make LGBTQ gifted adolescents feel accepted and included. In other words, a "regular" or "normal" environment that does not take specific action to overcome heterosexual and cisgender biases is not representative of a safe and inclusive environment for LGBTQ persons. Psychologists must actively be aware of heterosexual and cisgender privilege along with their personal conscious and subconscious biases. Psychologists may actively address orientation and identity biases by providing preferred pronouns upon introduction, including gender nonconforming options on all forms, asking open-ended questions which refuse to conform to societal expectations, and by containing an open willingness to discuss minority sexual orientation and gender identities.

While the USA as a whole is becoming more accepting of diverse sexual orientation and gender identities (Hans et al., 2012), it is important to remember all citizens may not be supportive of this movement. Though it is generally considered "healthy" development to "come out" as a member of the sexual and/or gender minority community, in contrast to "being in the closet" (Savin-Williams, 1998), it may not be safe for gifted students to reveal their LGBTQ identity in certain contexts. For example, revealing ones sexual and or gender minority status may lead to devastating consequences (e.g., physical violence; Wright & Perry, 2006). It would be detrimental to recommend a LGBTQ gifted student "come out" to someone in a context which may cause physical or emotional abuse due to their identified sexual orientation and/or gender identity. Psychologists and teachers should accept gifted students LGBTQ identity while working to help the gifted student discover safe and value aligned ways to reveal their sexual orientation and/or gender identity to those they choose.

In regard to LGBTQ gifted adolescents, one advantage is their ability to read at high levels and to utilize books and online resources detailing information about what it means to be a sexual

and/or gender minority. Psychologists may have success-utilizing bibliotherapy to help LGBTQ gifted students feel less isolated and increase awareness of their sexual orientation and gender identity. In addition, outside resources such as gay–straight alliance may assist both the gifted and LGBTQ identities of an individual by introducing students with similar interests and creating awareness of LGBTQ identities to newly identified sexual and gender minority gifted youth. Community experiences that engage LGBTQ gifted students' area of interest and talent (e.g., community theater) while exposing them to community mentors (e.g., studying with a community artist) should be encouraged.

For LGBTQ youth career counseling must consider their orientation and gender identity. Concerns of physical and emotional safety have a significant impact on career decision-making of LGBTQ gifted students (Peterson & Rischar, 2000). In fact, LGBTQ adolescents may refuse to enroll in high school or college courses despite their interest in topic due to physical and emotional safety concerns. The career that is "safe" and provides a welcoming environment is more likely to be chosen over pursuing the career that aligns with their interest and gifted abilities. Psychologists should be aware of this tendency and work to thoroughly examine the extent of the LGBTQ gifted students safety concerns and how it impacts their career choice.

Finally, LGBTQ gifted youth are often creative in the ways in which they deal with their feelings of differentness and isolation. Research has noted LGBTQ gifted students may find supportive groups, hide or downplay their LGBTQ identity, participate in extracurricular activities, confide in supportive teachers, conduct research to understand/develop their identity, and focus on the development of their artistic and leadership talents to express their feelings of differentness and isolation (Hutcheson & Tieso, 2014). Psychologists should not be afraid to be creative in the development of healthy coping strategies for LGBTQ gifted students. Consulting with the LGBTQ gifted student on potential healthy coping strategies may build the therapeutic alliance and provide insight on the student's natural and creative ways of coping. LGBTQ gifted persons have also reported that their giftedness interacts with their LGBTQ identities (Hutcheson & Tieso, 2014). Psychologists should be aware of this potential interaction and ask the student how their giftedness and LGBTQ identities interact with each other to better determine individualized and creative coping mechanisms for the LGBTQ gifted student.

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9 The Role of the Family in Talent Development

Paula Olszewski-Kubilius

Abstract

The family is the first and often the most important influence on the developing child. Family characteristics and functioning can positively and negatively influence the development of talent and interact with personal characteristics of the child. In addition, family dynamics can differentially support the development of high achievement and high creativity. Optimal families are ones that balance family closeness with support for autonomous pursuit of unique talent development paths. Family dynamics contribute to the development of key characteristics of adult creative producers including the ability to spend significant time in self-imposed, talent developing practice and study; a preference for unconventionality and independent thinking; coping skills for stress, anxiety, and intellectual complexity; and a tendency to express and resolve emotional issues through creative work in a chosen domain.

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Introduction

The family has very profound effects on the developing child, influencing beliefs, values, and opportunities. The family plays a critical role in determining who a child becomes and what he or she accomplishes. For a child with talent, the influence of the family can be the determining factor as to whether exceptional ability is developed to a high level or not. We all know individuals who are very accomplished and successful despite less than advantageous family circumstances or even truly awful ones and similarly, individuals with seemingly loving and supportive families who do not live up to their potential. In this chapter, we explore some of the reasons why these different outcomes occur with a focus on psychological aspects of family functioning as they affect talent development.

Families as Systems

The family is a complex system with many facets and members who are interacting within multiple contexts and embedded in various social networks. Families have both generational and cultural histories that impact their present-day circumstances, values, and priorities. While families are the first socializing context experienced by the developing child, families are embedded in broader social milieus such as neighborhoods

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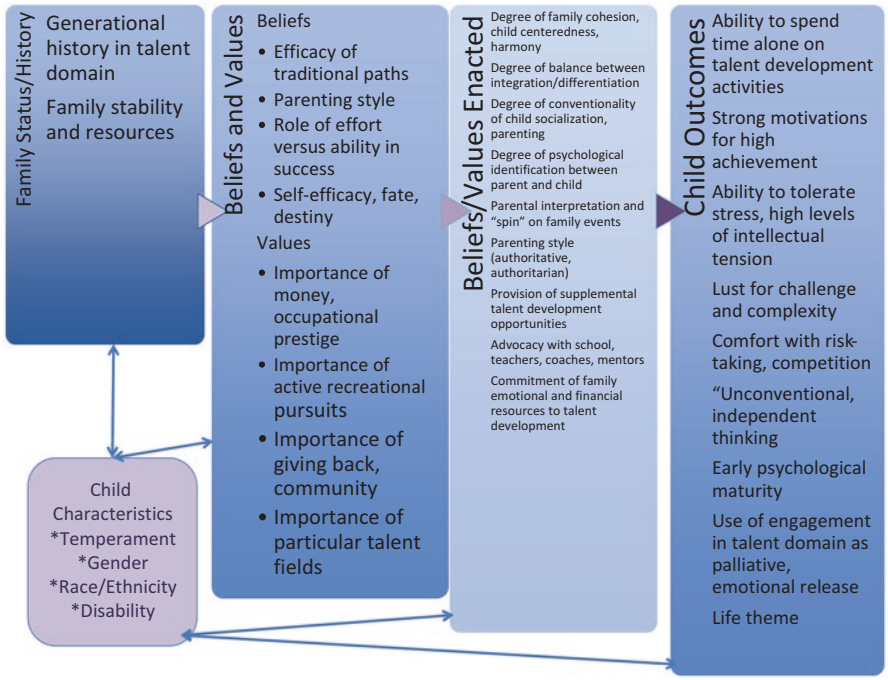

Fig. 9.1 Model of the family influence on the development of talent. Originally published in Olszewski-Kubilius, P., Worrell, F. C., & Subotnik, R. F. (2017). The role of the family in talent development, In S. F. Pfeiffer and M. Foley-Nicpon (Eds.), *APA Handbook on Giftedness and Talent*. Washington, DC: American Psychological Association

and communities that include socializing institutions such as schools and community organizations, and socializing agents, such as teachers, which also affect the acquisition of norms, values, and ideologies. Families often remain a primary influence on the developing child but as a child grows, the potential for influences beyond the family increases.

Most of the research on families explores only limited aspects of family functioning, generally in isolation of the family system itself as well as broader systems and contexts, and commonly, only at one point in time. Figure 9.1 presents a model of family influence on the developing, talented child with a holistic approach. It depicts how family values and parenting interact with and respond to child characteristics and result in actions that affect the acquisition of beliefs, values, and motivations that contribute to achievement and success, moving the child along a path from potential to competence, expertise, and, ultimately, for some, to adult creative productivity and eminence (Subotnik, Olszewski-Kubilius, & Worrell, 2011).

Characteristics of the Child and Family that Affect Talent Development

Family History and Generational Influences

All families have histories represented by the past accomplishments of previous generations as well as values and messages that are passed down from one generation to the next. A family's generational history and stability affect the way and the degree to which a family can assist in the development of the talents of children and family influences can come from the distant past and preceding generations in two ways (Albert, 1994). One is through a history of involvement in a particular domain such as music or politics. There may be a great deal of press for successive

generations to enter these traditional and highly valued domains or professions and the family may be particularly well positioned through social capital to foster achievement in those areas (e.g., politics in the Kennedy family, music in the Jackson family). History of involvement in a particular field also reflects collective family values that are passed on to younger generations (e.g., a shared value of service to one's country) by older family members.

The second way in which family history affects opportunities for talent development is through the stability of generations and the accumulation of educational (e.g., knowledge about and experience with higher education), social (e.g., social standing, social connections), and financial resources or assets (Albert, 1994; Bourdieu, 1992). As the number of stable generations increases, so does the ability of the family to garner sufficient degrees of knowledge, skills, experience, and financial resources. Albert, in fact, suggests that three stable generations are needed before the family can move from an exclusive focus on survival and day-to-day needs to a greater focus on the future, including developing the special talents of children. Successive stable generations will often have greater amounts of disposable resources (i.e., time and money) that can be put towards talent development such as extracurricular activities, special programs, and lessons and materials for informal learning at home (Albert, 1994; Olszewski-Kubilius & Corwith, 2018).

The educational advantages of multiple successive, stable generations is supported within the empirical research on the relationship between socioeconomic status and parenting practices. For example, Roksa and Potter (2011) found that families that have been stable as middle class for two generations engaged in more concerted cultivation of cognitive skills with their children, defined as involving them in outside-of-school activities, being engaged with their schools and teachers, and talking to their children about their interests, goals, and future, compared families that have been stable as working class for two generations; families that are transitioning from working to middle class status resembled stable middle class families in terms of the emphasis on and cultivation of educational achievement (Roksa & Potter, 2011).

Research also shown that gaps in informal learning opportunities about the natural world, contribute to early and persistent disparities in science achievement between low and higher income children (Morgan, Farkas, Hillemeier, & Maczua, 2016). Research also documents a growing income activity gap between higher and lower SES children regarding participating in extracurricular activities. Involvement in extracurricular activities is associated with higher test scores and educational attainment as well as increased social capital via access and connections to mentors, coaches, teachers and academically oriented peers (Snellman, Silva, Frederick, & Putnam, 2015). Additionally, parents with higher levels of education can share tacit knowledge about such things as educational and career paths (Giancola & Kahlenberg, 2016).

Other aspects of families can affect their ability to support a talented child. One of these is marginality or the degree to which the family is dissimilar or isolated from the social context in which it lives or resides, or the extent to which the family perceives itself outside the mainstream cultural group (Albert, 1994). Families may be marginal because of their race, ethnicity, religion, or SES. Marginality can have negative effects on a child because society restricts upward social mobility and opportunities for some groups (Olszewski-Kubilius & Corwith, 2018). Alternatively, it can also have the effect of freeing the family from feeling that they must adhere to societal conventions, particularly regarding traditional paths towards achievement that include long years of training and education. These families may believe that the traditional routes to success will not result in the same occupational and financial rewards as for more mainstream and advantaged individuals, and instead push their children along nontraditional paths such as early entry into sports or entertainment fields or entrepreneurial endeavors (Albert, 1994; Liu & Clay, 2002; Liu, Soleck, Hopps, Dunston, & Pickett, 2004). Minority families may also eschew traditional education as a way of

protecting or participating in a subculture with which they identify and from which they receive social support and affirmation of racial identity (Ogbu, 1992). Similarly, immigrant families may promote their gifted children's entry into lucrative professions such as medicine, engineering, law, and dentistry rather than scholarly research fields or the arts to secure financial stability. In summary, deeper and influential processes underlie family status variables such as generational history, income, or race and can have a profound influence on a family's ability to support a child's talent development.

Individual Child Characteristics

Seemingly superficial characteristics of the talented child, such as birth order and gender, have powerful psychological effects on the talent development process as well because they can influence parental expectations for achievement, particularly regarding domain and level of achievement (Olszewski-Kubilius, 2008; Olszewski-Kubilius, Worrell, & Subotnik, 2017). There is ample documentation from both the child and adult research literature that intellectually gifted (high IQ) individuals are disproportionately first-born children (Olszewski-Kubilius, 2008). Albert (1994, 1980) views birth order as an important psychological organizer for a family, and he differentiates between "favored" children who are usually the oldest or youngest children in the family and "special" children who are exceptional because of circumstances, such as the child born after the loss of an older child. According to Albert, favored or special children may be the object of great parental pressures to achieve and are often steered towards the family profession. A child's gender can also affect parental expectations for levels and domains of achievement and the provision of opportunities and resources for talent development (Arnold, Noble, & Subotnik, 1996). Historically, males have been the focus of socialization pressures for high achievement within families but females can also occupy a special or favored position within the family (Albert, 1980).

Disabilities of a child set up family psychological processes that can either hinder or facilitate talent development. A physical or learning disability combined with intellectual giftedness may cause a family to be overly protective of a child which can result in reduced opportunities for talent development or an exclusive focus on the disability and lack of recognition of the gift (Olszewski-Kubilius et al., 2017). Alternatively, it may also galvanize families to commit to even higher levels of support to ensure development of the talent (Speirs Neumeister, Yssel, & Burney, 2013). Rejection or low expectations as a result of a disability may be motivating to a child, engendering a desire to prove low expectations false ("I'll show them"), or to gain attention, admiration, and acceptance from others (Goertzel, Goertzel, Goertzel, & Hansen, 2004), Ochse, 1993).

In summary, child characteristics affect the development of talent because they can serve as a psychological organizer, influencing expectations and family interaction and socialization patterns as well as the allocation of family resources.

Family Characteristics

The literature on the families of intellectually gifted children is consistent in finding that parents use an authoritative parenting style (Olszewski-Kubilius, 2016), and homes tend to be quite child-centered (Bloom, 1985; Olszewski-Kubilius, 2008; Olszewski-Kubilius et al., 2017). This has been found in multiple studies and in a variety of culturally diverse samples of intellectually gifted children (Borland, Schnur, & Wright, 2000; Chan, 2005; Dwairy, 2004; Hébert, 2000; Pilarinos & Solomon, 2017; Sampson, 2002). Similarly, research on parenting styles among non-gifted, heterogeneous groups of children find that authoritative parenting is associated generally with higher academic achievement. A large meta-analysis involving 308 empirical studies examined the relationship between parenting styles and academic achievement operationalized as grades and test performance, and found that parental warmth, autonomy granting, and authoritative parenting style were associated with higher academic achievement both concur-

rently and long term (Pinquart, 2016). Authoritative parenting is deemed optimal compared to other parenting styles as it combines nurturing of children with the use of reasoning and open communication, high expectations for achievement, and consistent and fair discipline. In research on gifted children, authoritative parenting has been found to be correlated with higher IQ scores (Rudasill, Adelson, Callahan, Houlihan, & Keizer, 2013), associated with higher levels of social competency (Olszewski-Kubilius, 2016; Olszewski-Kubilius, Lee, & Thomson, 2014), and correlated with healthier form of perfectionism (Speirs Neumeister, 2004),

Other commonly found characteristic of families of high achievers include cohesion, which consists of close and harmonious relationships among family members, strong identification between parents and children, and adaptability or the ability to adjust to unexpected or stressful circumstances (Olszewski-Kubilius, 2008, 2016; Olszewski-Kubilius et al., 2014). Higher family cohesion and adaptability are associated with better social and emotional adjustment and higher levels of social skills in intellectually gifted children (Olszewski-Kubilius et al., 2014), which become increasingly important at advanced stages of talent development and is manifest in the use of more productive strategies for coping with giftedness such as seeking social support from others and applying problem solving strategies to social situations (Callahan et al., 2004).

Some unique features found in studies of families of intellectually gifted children are assessed levels of cohesion that are considered to be maladaptive along with higher levels of structure, organization, and family rules (Olszewski-Kubilius et al., 2014; Taylor, 1998). However, these levels were not found to be problematic as rules were coupled with flexibility and adaptability as needed. Olszewski-Kubilius et al. (2014) speculate that a higher degree of cohesion may reflect longer and increased dependence of children on adults to assist with transportation to lessons, coaching sessions, and outside of school programs. For example, Kierwa found that the parents of elite performers in voice, baton twirling, swimming and softball were involved as coaches and created opportunities for their child to participate in their sport within their local schools and communities (Kierwa, 2016, unpublished). Similarly, parents may establish more rules and impose greater organization as a way of managing and supporting family members' involvement in multiple extracurricular and supplemental activities.

The ways in which parents interact with their young gifted children may actively foster the early development of intrinsic motivation (Olszewski-Kubilius, 2016). For example, parents of young high IQ children used curiosity, inquisitiveness and task engagement, considered task intrinsic motivation strategies, in their interactions with their children rather than external rewards and punishments, which have been found to result in higher levels of achievement motivation (Gottfried & Gottfried, 2004). Similarly, parents of older intellectually gifted children eschewed controlling strategies such as rewards and punishments for autonomy promoting motivational practices such as supporting and capitalizing on their children's interests to engage them productively at home (Garn, Matthews, & Jolly, 2010). Parents of older children served as emotional coaches and support for their children, helping them reframe losses or disappointing performances as opportunities to grow and improve, thereby enabling their talented youngster to maintain engagement and motivation (Kierwa & Witte, 2013, 2015; Witte, Kierwa, Kason, & Perry, 2015).

A theme that emerges from research findings on the families of gifted children is the importance of balance between forces that bring family members together and those that push them towards their separate and unique paths. Csikszentmihalyi, Rathunde, and Whalen (1993, p. 156) found that families of teens talented in domains such as music and mathematics were "complex," which they defined as having a balance of integration or close bonds and connections between family members (i.e., cohesion) and differentiation, defined as the expectation that each family member will be supported and expected to develop his or her unique talents and seek out challenging talent development

opportunities. Family members were emotionally close and connected, but supported each other's expressions of and desire for individuality. According to the authors, complex families promote the development of an autotelic personality, one that is characterized by persistence, curiosity, a preference for challenge, and intrinsic motivation to learn, and serves talent development well.

Not surprisingly, the families of underachieving, intellectually gifted children are frequently characterized as chaotic and dysfunctional (Hébert, 2001; Peterson, 2001; Siegle, 2013) with parenting that can be either neglectful (Peterson, 2001), overly strict or lenient, or inconsistent (Hébert, 2001; Rimm, 2008; Siegle, 2013). These findings mirror those of large body of research on general parenting practices that indicates that overly controlling or permissive parenting is detrimental to academic achievement (Pinquart, 2016). Taken together, the research on families of achieving, underachieving, and creative individuals suggests that the influence of parenting style is complex and interacts with other variables to affect child outcomes.

Family Values: Espoused and Enacted

Parents send many messages to children through their words and actions. Messages may include the value of hard work, persistence, and achievement; the importance of pursuing traditional educational paths; beliefs about destiny and control over events; beliefs about the importance of money, status, and social standing in defining success and happiness; the importance of being involved in one's community, staying connected and sharing talents through community contributions; and the importance of active recreational pursuits and a well-balanced life (Barni, Ranieri, Scabini, & Rosnati, 2011; Cheung & Pomerants, 2015; Fuligini, 1997).

Parents implicitly convey their beliefs and values to children through actions such as providing educational materials in the home, lessons or coaching; advocating for differentiated instruction or accelerated placements within school; arranging family schedules to enable participation in talent development activities, study and practice; providing direct teaching; and centering family life and financial resources around children's activities (Kierwa & Witte, 2013, 2015; Witte et al., 2015). Consonance between verbally expressed values and parental actions is optimal for high achievement (Speirs Neumeister et al., 2013), while inconsistency is implicated for underachievement among low-income minority, high potential students (Sampson, 2002) and children of well-educated parents (Rimm, 2008; Siegle, 2013).

How Values Are Communicated to Children

Albert (1994) identified two different ways in which values from parents and preceding family generations are transmitted to children, intergenerational and transgenerational transfer processes. Intergenerational transfer processes occur via normal day-to-day family interactions and are largely influenced by the family's present social and economic circumstances. Intergenerational transfers help to maintain family relationships and their effects are direct, immediate, and current. However, depending upon characteristics of the child (e.g., gender and birth order) and the parent–child relationship (e.g., degree of affection, identification, and interdependence) not every child in the family experiences the same family context nor receives the same value-laden messages (Albert, 1994). In contrast, transgenerational transfers operate from a family's distant past into the family's future and while the origins of these messages may be vague, they still can be powerful and communicate expectations for achievement, family traditions including preferred fields of achievement, aspirations, and family norms (Albert, 1994).

Messages about values within families are a mixture of intergenerational and transgenerational transfers but eminent, creative producers almost always come from families where there are significant transgenerational messages. Albert (1994) hypothesizes that "transgenerational transfers give the talented individual historical continuity and a feeling of connectedness and

responsibility to and from one generation to the next, which may have a significant role in creating and sustaining the powerful motivation and persistence needed to reach high levels of achievement in various domains. In contrast, families that are primarily intergenerational in orientation tend to socialize children more conventionally and towards traditional routes of achievement … perspectives" (Albert, 1994, p. 349). As a result, they are more likely to foster creativity in children than intergenerationally oriented families.

Another way in which families communicate values and beliefs to children is through the role they play as translator, interpreter, or filter for outside events and circumstances (Olszewski-Kubilius et al., 2017). Csikszentmihalyi and Beatti (1979) assert that families have systems of cognitive coding or patterns of explanations for events that they share with their children. Negative situations or circumstances such as poverty, loss, and marginality are interpreted for children by adult family members, and these interpretations profoundly affect children's world view (e.g., whether they view the world as full of opportunity for them and inviting versus lacking in opportunities), beliefs about themselves, and the degree to which they can affect their own success and achievement. These messages influence children's present-day values and future choices.

There is some evidence that different patterns of family communication and interaction may differentially support the development of creativity versus high academic achievement (Albert, 1980; MacKinnon, 1965; Roe, 1953). High academic achievement has been found to be associated with harmonious family relationships, cohesive, and child-centered families, and parents who socialize their children to conform to societal rules and expectations and encourage them to pursue traditional educational and career paths. In contrast, creative producers had family relationships characterized as tense, yet secure, with sometimes distant or competitive relationships between parent(s) and child, and a more permissive parenting style (Albert, 1980; Miller, Lambert, & Speirs Neumeister, 2012). These families were less demanding of conformity to parental values and to societal conventions and allowed their children greater freedom to pursue unique paths and express independent ideas. Researchers hypothesize that the underlying psychological mechanism by which family dynamics that include looser parent–child bonds, weaker parent–child identification, and less conventional socialization promote creativity include the early fostering of psychological maturity and independence on the part of the child (see Olszewski-Kubilius, 2008 for a fuller discussion).

The empirical evidence regarding verbally espoused and enacted values for gifted children is relatively limited but includes the following: parents of young but renowned musicians, artists, scientists, and athletes stressed winning, success, doing one's best, persistence, excellence, and being productive (Bloom, 1985); parents of creative architects emphasized cultural and intellectual pursuits, success, ambition, diligence, and development of one's talent (MacKinnon, 1965); parents of high IQ children stress that achievement comes first even though high levels of achievement have costs (Herskovits, 2000); and parents of artistically talented Singaporean students stressed the importance of respect, hard work, and discipline (Garces-Bacsal, 2013). Parents do back up their verbally espoused values and beliefs with actions and these positively affect achievement. They provide students with materials and support at home for study, encourage independent work in the talent area, assist with homework, limit television viewing, advocate for their twice exceptional children at school, and actively seek talent developing opportunities outside of school (Albert, 1978, 1980; Bloom, 1985; Corbin & Denicolo, 1998; Freeman, 1979; Garces-Bacsal, 2013; Garn et al., 2010; Getzels & Jackson, 1962; Gottfried, Gottfried, Bathurst, & Guerin, 1994; MacKinnon, 1965; VanTassel-Baska, 1989; Wu, 2008). In fields in which talent is developed largely outside of school, such as chess and baton twirling, parents go to great lengths to find teachers and coaches who can help their child reach higher levels of talent development and spend considerable amount of time and financial resources to provide lessons and enable

children to participate in competitions (Kierwa & Witte, 2013; Witte et al., 2015). Of course, parental actions vary by the needs of the child and the capabilities of the parent and there is a fine line between parental support and over–involvement; some research suggests that too close monitoring of homework including rules about homework and grades is negatively associated with academic achievement amongst high achievers (Konstantopoulos, Modi, & Hedges, 2001), as well as among children in general (Pomerantz, Moorman, & Litwack, 2007).

Research done with non-gifted, heterogeneous groups of children regarding the effects of parental home support for academic achievement (e.g., providing a quiet place to study, assisting or monitoring homework, talking to children about their school performance) shows a very small to negligible effects on academic achievement (Fan & Chen, 2001; Pomerantz et al., 2007). In contrast, empirical research supports greater impact for parental actions centered on school involvement such as volunteering at school, attending parent–teacher conferences, and interacting with teachers regarding their child's performance. However, this relationship is complex with greater effects of parental school involvement for lower achieving children than for average or above average achieving children (Pomerantz et al., 2007). In a comprehensive review of the literature, Pomerantz et al. note that while research supports that the quantity of parental involvement in school is beneficial to achievement, the nature of it—particularly involvement that is based on positive affect towards the child, autonomy supportive, and accompanied by positive beliefs about the child's potential for learning is perhaps more important, yet generally understudied. The authors speculate that school involvement coupled with these attributes fosters higher achievement by positively affecting motivation for school and self-efficacy. Fan and Chen (2001), through moderator analysis within a comprehensive meta-analysis, found that high expectations for achievement on the part of parents were the school involvement variable that had the strongest relationship to actual achievement.

How Family Characteristics and Dynamics Engender Characteristics that Support Their Children's Talent Development

Identifying characteristics of families of children who are academically or creatively gifted is useful, but the more important question is how these attributes affect the individual to result in the development of talent. What are the processes that occur within families that result in children who are motivated to achieve, goal-directed, confident, persistent, resilient, open to experiences, and are willing to spend the countless hours studying and practicing skills needed for success in their talent field?

It is important to emphasize that there is great variability within any group of individuals, including gifted ones, in terms of personality characteristics, values, and dispositions. McAdams and Pals (2006) define personality broadly as an individual's unique variation on the general evolutionary design for human nature, expressed as a developing pattern of dispositional traits (extraversion, friendliness, dominance, etc.), characteristic adaptions (e.g., goals, strategies, strivings, motives, values, and schemas), and self-defining life narratives (individual life stories that unify and create meaning), complexly and differentially situation in culture and social context (p. 212). Many prominent researchers in the field of talent development agree that attributes of the individual, specifically personality and motivation, are the most important components of creative achievement and differentiate achievers and producers from others, particularly at higher stages of talent development (Csikszentmihalyi, 1985; Ochse, 1993; Simonton, 1984, 1992). Csikszentmihalyi (1985) writes. "The unifying similarity among geniuses and innovators is not cognitive or affective but motivational. What is common among them is the unwillingness or inability to strive for goals everyone else accepts—their refusal to live by a presented life theme" (p. 114). Winner (1996) writes, "After a certain point, levels of ability play a less important role than personality and motivational factors" (p. 283). Ochse (1993) says, "It is consistently recognized that the

creators most salient characteristics is persistent motivation" (p. 133).

How do circumstances within the family interact with individual temperaments and personalities to produce the motivational patterns and dispositions necessary for high levels of achievement and creativity? The research literature provides some clues as to the family dynamics that may contribute to the development of four important characteristics of successful, creatively productive adults: an ability to spend significant time in self-imposed, talent developing practice and study; a preference for unconventionality and independent thinking; coping skills for stress, anxiety, and intellectual complexity; and a tendency to express and resolve emotional issues through creative work in a chosen domain.

Ability to Spend Time Alone in Self-Imposed Talent Development Practice and Study

Successful, high achieving adults have spent inordinate amounts of time acquiring the skills and knowledge needed to reach levels of expertise in their talent field. Some speculate that this involves approximately 10,000 h of study or practice (Ericsson, Nandagopal, & Roring, 2005), with the number of hours required inversely related to ability level in the domain (Hambrick, Oswald, Altmann, Meinz, Gobet, & Campitelli, 2014). Their physical and psychic energy has necessarily been focused on development within the talent area and this starts relatively early, typically facilitated by parents who provide early exposure to the talent area as a part of typical family recreation and serve as the first teachers (Bloom, 1985). As the child develops, parents step back and assume managerial and engineering roles by accessing appropriate teachers, educational and training opportunities; supervising practice and interacting with teachers and coaches, arranging family schedules, so that the child can remain focused on learning and make progress in developing in the talent area (Kierwa & Witte, 2013, 2015). With development in the talent area, individuals take on more responsibility for guiding their learning including setting goals, using motivational strategies to persist in deliberate practice, and developing strategies to stimulate creative thinking (Olszewski-Kubilius et al., 2017).

Being very focused on the talent field necessarily means having less time for other typical childhood activities. While in many cases, this is driven by the child's desire to master and passion for the talent field (Winner, 1996), retrospective studies also suggest that many creative producers found themselves somewhat isolated as children due to poverty, handicaps or family circumstances and turned to talent development activities to fill up the time alone (Olszewski-Kubilius, 2000, 2008).

The ability to spend time alone in reading, study or practice is a critical component of the talent development and essential to reaching high levels of expertise (Ericsson et al., 2005; Simonton, 1992; Winner, 1996). Research suggests that voracious and wide-ranging reading in childhood is a hallmark of many creative producers and necessary to build the rich background of knowledge that may be the base for interesting cross-disciplinary connections and novel links between disciplines (Simonton, 1994).

A vivid imagination may be another characteristic of creative producers fueled by time alone in fantasy or pretend play. Childhood play has been linked theoretically and empirically to creativity (Russ, 2003). A rich internal fantasy life often served as a coping strategy for a young child with few playmates or opportunities to play with others (McCurdy, 1983), but it can facilitate the development of visualization strategies for solving complex problems. Internal fantasy is also useful as a means to deal with stressful circumstances, traumatic events, and psychological pain and can be a lifelong coping strategy. Many children use fantasy, internalized in the form of daydreams and externalized through play, to deal with circumstances beyond their control, rewriting real events into scripts that are more palatable such as inventing a caring alternate family, changing the outcomes of a situation, or being the super-hero (Ochse, 1993).

Csikszentmihalyi et al. (1993) identified the inability to spend time alone as a major obstacle to talent development for gifted adolescents. In

their research, talented teens who could cope with the anxiety and loneliness of time alone were able to persist during adolescence with practice and other talent developing activities. Ochse (1993) proposed that having to spend time alone as children and learning to cope with solitude enables individuals to not only tolerate it but to embrace it and develop a preference for time alone, "Aloneness is not merely the effect of circumstances in the lives of creators. It is often part of their personality for the creator is often apart and withdrawn even in the presence of others and often makes a deliberate attempt to seek solitude" (Ochse, p. 169). Similarly, Csikszentmihalyi et al. found that talented teens learned to enjoy solitary activities and keep connected while alone by talking on the phone and writing letters to friends, something today's teens can do with email, text- and instant-messaging. Eminent women were characterized by a "habit of solitude" (Kerr & McKay, 2014, p. 98)

Spending too much time alone is not healthy for developing children and friendships, social relationships and support from others is critical to psychological health (Lee, Olszewski-Kubilius, & Thomson, 2012). While there may be positive outcomes of a lonely childhood such as investment in talent developing activities, not all children who experience such circumstances may be able to use the time alone productively. It is unknown what enables one child to turn to learning and reading when isolated or lonely versus less productive kinds of activities. Clearly, opportunities to engage in talent activities because books, art materials, or musical instruments are available in the home is one factor. Modeling by parents of productive use of alone time may be another contributing factor. Developing imaginational skills can be facilitated by exposure to imaginative activities and fantasy through books, theater, and other media and cultural activities and the encouragement of play.

Coping Skills for Stress or Tension

Another characteristic of creative producers is an ability to tolerate high levels of a quality that has been variously referred to by researchers as marginality (Gardner, 1994; Simonton, 1994), asynchrony (Gardner, 1994), risk-taking (Gardner, 1994; Simonton, 1992), or discordance (Feldman, 1994). All of these terms refer to an ability to deal with situations that are ambiguous, ill-defined, and anxiety or tension producing. The states of tension may be because the individual is working on the edges of his/her competency (Neihart, 2008), at the margins of a field, on very complex, ill-defined problems, important problems, or in very competitive situations (Bronson & Merryman, 2013; Olszewski-Kubilius, 2008; Olszewski-Kubilius et al., 2017). According to some researchers, creative individuals thrive on tension and seek to challenge themselves to deliberately "up the ante" (Gardner, 1994) and/or take pleasure from increasing and reducing intellectual tension by solving challenging problems (Ochse, 1993).

What family conditions in childhood or what kind of parenting enable children to develop a high tolerance for tension, intellectual or otherwise, and/or a preference for intellectual risk-taking or discordance? Retrospective research suggests that many eminent producers experienced tension filled childhoods as a result of parental loss, family dysfunction or instability (Goertzel, Goertzel, Goertzel, & Hansen, 2004), which may have helped them acquire coping skills at an early age that served them well as they moved to higher stages of talent development. No one would promote tension filled family environments for children as a way to advance talent development but research findings suggest that an ability to cope with challenge may give some individuals an advantage over others in terms of reaching higher levels of achievement that necessarily require risk-taking and resilience. MacNamara, Collins, and Holmes (2016), in their research on music prodigies, found that overly smooth and successful involvement in the talent field may not provide the preparation for the inevitable challenges that will occur along the path to adult accomplishment. These authors suggest exploiting natural life challenges and the creation of artificial developmental challenges (i.e., challenges in the domain of talent) at devel-

opmentally appropriate times to help talented individuals acquire coping skills and resilience (MacNamara et al., 2016).

It is more likely that the type of childhood experiences along with the kinds of supports available within the family and broader environment together determine the nature of the impact of childhood traumas on talent development and specifically the acquisition of resilience and coping skills. Csikszentmihalyi et al. (1993) suggest that an overemphasis on integration over differentiation within the family would likely result in individuals who are well adjusted and competent but not necessarily highly talented or creative. Alternatively, an overemphasis on differentiation over integration would support the development of high levels of talent and creativity, but possibly at the expense of good mental health and adjustment. Emotional and instrumental support from parents coupled with high expectations that challenge children to develop their abilities is likely optimal. Csikszentmihalyi suggests that inborn talent or the desire to overcome personal tragedy and disability might explain the development of the highly creative productive individual with less than supportive families or circumstances and that eminent levels of talent may require a motivation resulting from childhood tragedy and unmet or compelling psychological needs, while other, more typical levels of talent and achievement, result from a more balanced blend of tension and support within families.

Therival echoes (1999a) that family discord or tragedy is not essential to the development of creative productivity. According to Therival, creativity can develop in individuals who experience tension filled, stressful family environments as long as there are also what he calls, great assistances present. Therival distinguishes between creators who were dedicated (i.e., had many assistances, high ability and no major family misfortunes) and those who are challenged (e.g., have high ability, some assistances and some misfortunes). Both types produce creative work but challenged personalities are more overtly driven to prove themselves and receive recognition (Therival, 1999b). Therival also asserts that misfortunes such as parental conflict or loss of a parent create challenges that elicit coping skills on the part of the child, while other misfortunes, such as psychological or physical abuse, cause antagonism and result in rejection of adults and authority figures in general and creativity that often is funneled into lifestyle and mannerisms and not substantive work (Therival, 1999a, 1999b).

Collins, MacNamara, and McCarthy (2015) studied the incidences of trauma in the backgrounds of athletes at three different levels of accomplishment—super champions, champions, and "almosts." They defined trauma broadly to include family dysfunction, injury, or psychological issues. The authors found no differences in the amount or kind of trauma experienced by the three groups of athletes but did find qualitative differences in how such challenges were viewed and dealt with. Super champions and champions viewed such challenges positively and as opportunities to improve and reset goals. Their commitment to the sport was unwavering and they were not deterred by setbacks. The authors suggest that parenting that led to the development of good coping skills and psychological resilience is what enabled high performing athletes to maintain focus during difficult times. They further contend that while the path towards elite performance in any domain is not linear and will have ups and downs (MacNamara et al., 2016), teachers, parents, and coaches can help talented individuals to anticipate them and develop resilience, coping skills, and the mindset to view them as opportunities for growth and improvement.

Thus, being able to cope with the stresses and challenges that are an inevitable component of any talent development path is important. The source, nature and intensity of the challenging circumstances in the lives of talented individuals likely affect the degree to which creativity and a taste for intellectual tensions are fostered at the expense of good mental and psychological health. In addition, parenting or coaching that fosters psychological strength may reduce individuals' vulnerability to being deterred by the inevitable stresses and challenges.

Unconventional and Independent Thinking

A characteristic of creative producers is free and independent thinking, the tendency to be unconventional, to reject societal traditions, to follow a unique path and inner voice, and to risk putting forward radical ideas (Olszewski-Kubilius, 2008; Olszewski-Kubilius et al., 2017).

As stated earlier, families that are well established, with several generations and have ample resources and social capital, can be more tolerant of nontraditional interests and creative careers that may be less lucrative. Any event or circumstance in childhood that affects parents' abilities or desire to teach children about society's codes, rules, and traditions such as parental loss or dysfunction can result in individuals who are less conventional. Therival (1999a) proposed that when parents are unable or unwilling to teach children about the routines, traditions, or taboos of society, what he calls societal "scripts," the individual is free to create their own. "In this optic, creative insights come from the clash of quality individual scripts with the scripts of the majority, from a constructive resolution of both sets of scripts that are "rotated" around a key common point or set of points" (Therival, p. 49).

Albert (1978) proposes that the patterns of differences he observed between families of creative children versus scholastic achievers can foster different kinds of motivations regarding achievement. According to Albert, the less conventional parenting of creative children and tense family relationships foster a desire for power and influence over others, perhaps with one's creative ideas and products. In contrast, the conventional and traditional parenting and socialization practices of the families of scholastic achievers, along with close, cohesive family relationships, result in a motivation to excel in traditional ways. Less conventional socialization on the part of parents can include an emphasis on early self-sufficiency and independent action and thought (Albert, 1978).

Any circumstance that loosens affectionate bonds or disrupts the process of identification that occurs during adolescence between parent and child can contribute to producing individuals who are more independent in their thinking, who reject the accepted answers, who resist negative cultural stereotypes based on race or gender (Kerr & McKay, 2014), and who go their own way. Reduced affiliations between parent and child may result in a "cognitive freeing" that gives the child greater latitude to follow his or her own destiny, create an identity different from the parents, and pursue novel and unconventional paths (Albert, 1994; Winner, 1996).

Some individuals go beyond being unconventional and actually desire to stir up the status quo within a domain. They reject or do not have reverence for the existing structures and traditions of a field. They are rebellious and reject outside influences (Helson, 1996). This may be due to the combination of a desire and lust for tension (working on the margins of a field, pushing the cutting edge) and viewing things very differently as a result of very unconventional parenting and socialization. Ochse (1993) also suggests that desiring to shake up a field can be a rebellious reaction to stern, authoritarian, and controlling parenting in childhood. It appears that multiple childhood circumstances can result in a freedom from conventionality.

A family environment that fosters free and independent thinking and is unconventional may not in itself, result in creative potential or achievement. Simonton (1992) notes that "Disruptions to socialization will not do a child any good unless the freedom gained is maximally exploited—the time and energy that would have been spent on learning societal norms can be diverted to the acquisition of creative potential" (p. 286).

Finding Personal Meaning and Emotional Release in Talent Development Activities

A characteristic of creative individuals is that their intellectual and creative activities often fulfill a significant emotional need, which may account for their tremendous motivation and commitment. Piirto (1992, 1998) asserts that childhood traumas provide the grist of novels, poetry and artistic expressions. VanTassel-Baska (1996) studied several renowned female writers including Charlotte Brontë and Virginia Woolf

and found recurring themes, such as loss of mother or siblings and disappointments in love across their various works. Through a creative outlet, the individual finds expression for intense emotion, reworks traumas with better endings, and finds solace. Engagement in the talent development activities is emotionally soothing to the individual in part because it places them in safe, controllable circumstances, ones that they can manage, which may be different than the ones they are experiencing in their lives (Ochse, 1993). Achievement and the acclaim or rewards that come with it may compensate for childhood loss or rejection or be used to garner attention, respect or power (Ochse, 1993; Simonton, 1994).

Individuals may cope with a loss or disillusionment or some other childhood event by turning it into a life theme. Transformational coping involves reinterpreting a significant event or circumstance into a broader, existential problem that the individual then decides to dedicate himself to through his life's work (Csikszentmihalyi, 1990; Csikszentmihalyi & Beatti, 1979). A positive interpretation or spin is often facilitated by parents and significant others in the individual's life. Over the individual's career, the creative work becomes separated from the original problem and the motivation to produce and create eventually becomes the challenging questions and medium of the talent field itself. Rhodes (1997) proposes something similar when she distinguishes between D-Creativity and B-creativity. D-creativity results from deficiencies in acceptance, love, and respect, while B-creativity results from intrinsic motivation. D-creativity can turn into B-creativity, particularly as emotional needs are met, healing occurs, and "control of both the environment and the symbol systems used for expression" (p. 253) within the talent area are acquired.

Thus, achievement can be an important outlet for emotions and can be bound up with emotional needs of the individual. Whether this is healthy or detrimental to the individual psychologically and in terms of his or her talent development depends on many factors, including the coping skills of the individual and support from others. Suffice it to say that the tremendous motivation and persistence required for the development of abilities to a very high level will undoubtedly have some emotional component to it and this could be a very positive and healthy situation for an individual.

Parenting that Supports Talent Development

Table 9.1 lists parental actions and roles that support the fruition of talent and gifted ability from a developmental perspective. It illustrates that some parental roles are continuous throughout a child's development (e.g., emotional support) and others (e.g., proactively providing talent development activities and resources) that change significantly in nature over time.

Transforming Potential into Competency

In the early stages of talent development, playful exposure and opportunity to dabble are most important. Parents can provide opportunities for children to get exposed to a variety of different domains through home activities, family excursions, and enrichment programs. Parents' roles include that of a keen observer to discern their child's interests and fuel them with additional opportunities, while at the same time allowing young children to try many varied activities. Some children will sustain interest in a particular domain for a long period of time while others will change often. Parents can best support their child's interests by teaching them "on the fly," by answering questions and providing materials (e.g., videos, games, books) on topics of interest, although some children will be ready for direct teaching. Parents can also assist children in formulating and creating projects or products related to their interests. The goal is to foster the development of sustained attention, self-efficacy, and task persistence, which are critical for future stages of talent development. At this stage, parents can inculcate and reinforce important attitudes towards ability and effort by their use of

Table 9.1 The family's role in transforming potential into creative productivity

Transforming potential into competency
• Parents provide initial exposure to varied talent areas such as sports, music, art, mathematics, etc., in playful, enjoyable ways—initially very nonjudgmental—as part of family activities and family life • Parents seek out opportunities through museums, family excursions, community programs to provide enrichment, exposure to various fields, capitalize on demonstrated interests • Parents observe and support sustained interest and motivation • Parents employ task intrinsic (enjoyment, curiosity, engagement) versus task extrinsic motivational (rewards, punishments, incentives) strategies where possible and appropriate • Parents monitor verbal responses to children, emphasizing role of effort to cultivate a growth mindset • Parents seek teachers that initially emphasize enjoyment of talent area
Transforming competency into expertise
• Parents provide teachers than can further develop competencies and technical skills • Parents supervise lessons and practice, connect with teachers and coaches, provide the link between child and adult teachers • Parents coach children through setbacks that might thwart progress in talent field and provide emotional support through difficult times • Parents construct child's social network to support talent development—connect child with other peers with similar interests via play dates, social opportunities, special programs, actively manage and construct peer relationships • Parent's augment their own social network with others involved in talent field so as to get information on best teachers, related opportunities, etc. • Parents seek input of teachers regarding child's progress and development, access further services for child such as additional testing/assessment, acceleration, enrichment • Parents allow children to continue to "dabble" to some extent, sampling different domains and activities, so as to define and coalesce interests and motivation • Parents monitor stress level of child to cultivate coping strategies that retain focus on talent development activities • Parents play a role in arranging the child's schedule, school, practice, other activities so as to allow enough time for talent development, yet provide a blend that promotes mental health • Parents judiciously arrange family life to support talented child and his or her talent development activities • Parents alter school schedule to focus on talent area if necessary and advocate for child • Parents through own work, demonstrate love of learning, how to cope with obstacles and setbacks, persistence and motivation • Parents secure outside of school programs, contests, competitions, etc. that are additional opportunities for talent development • Parents reinforce child's emerging identity with talent field
Transforming expertise into scholarly productivity or artistry
• Parents enjoy child's success • Parents continue to support family member emotionally, especially through difficult times, setback, transitions • Parents support young professionals whose paths require internships or unpaid work to garner and access such opportunities and may assist with financial resources if possible

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appropriate types of praise and feedback. Task intrinsic motivational strategies are more efficacious than rewards, punishments, and incentives. Parents can also teach children and transfer values by modelling, for example, the active use of free time. Schools and communities must take a more active and deliberate role in providing exposure to various talent domains for children who come from disadvantaged circumstances through enrichment programs, summer programs, etc.

Transforming Competency into Expertise

The transition from competency to expertise requires increasing commitment to deliberate learning, study, and practice in the domain of talent. It can be difficult for children to sustain motivation in this stage as acquiring the foundational techniques and knowledge in the field is not always enjoyable. Parents can play an important

role in helping children stay engaged by providing access to appropriately challenging enrichment activities, peers with similar interests and talents, exceptional instructors and coaches, and adult mentors or professional who can provide tacit knowledge about career and educational paths. Parents can also assist with verbal messages that emphasize improvement and learning, thereby cultivating a growth mindset (Dweck, 2006) and by providing emotional support to deal with setbacks and "failures".

Parents continue to play an important role at this stage in garnering appropriate activities or opportunities both within and outside of school, including teachers, coaches and mentors matched to the child's interests, talent domain, and level of developed talent. This is especially important and time-consuming for domains that are primarily nurtured outside of school, such as dance or music. Rather than providing direct teaching, parents become managers, coordinating home and school logistics to enable their child to focus time and psychological energy on lessons and practice.

At this stage, children respond to need a combination of both extrinsic rewards (e.g., grades, awards, accolades for performances) and intrinsic rewards (e.g., self-efficacy and self-confidence due to growing competence), with balance being important so that practice and study are not entirely driven by parental demand or external affirmation (Olszewski-Kubilius, Subotnik & Worrell, 2015). It is increasingly important that students are able to spend time alone studying or practicing, or pursuing activities in their talent domain without parental prodding or constant supervision. The development of a supportive social network of other similarly talented and interested peers and adults can be initially orchestrated by parents via providing opportunities for children to socialize with other children in the talent domains. Parents must also help children assume increasing responsibility for building and maintaining a supportive social network as they progress.

It is critical that students learn to embrace challenge and to confront and resolve fears about competition, equipped with tools that include varied learning and coping strategies. Even gifted students need to learn how study or practice to achieve the maximum benefit from instruction and deal within increasingly difficult material. An essential tool is grit, or a long-term commitment to future goals (e.g., becoming a physician or psychologist) coupled with the day-to-day tenacity to meet immediate, shorter-term goals that build to longer term goals (e.g., completing AP classes) (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth, Quinn, & Tsukayama, 2012). Children may not see the connection between immediate and long-term goals but parents and instructors can help make these linkages explicit. Schools and community organizations must continue to play a stronger role in providing outside of school learning opportunities, including access to talented peers and mentoring by adult professionals, for children from socioeconomically disadvantaged families.

Transforming Expertise into Eminence

At this stage of talent development, parents' role as mediator, provider, or logistical coordinator of talent development activities diminishes. However, parents and family members are a continued source of emotional support and guidance as young adults make decisions about careers, marriage, children, etc. Depending on the talent field, parents may continue to provide financial support as young adults pursue internships or residencies.

Conclusions

Families of all individuals, including gifted and talented ones, are highly varied. Although the research gives us some clues as to the nature of optimal family supports for talent development, there are many individuals who achieve at high levels without them or even in spite of negative family environments. This suggests that there are many different paths that lead to adult achievement and creative productivity. It also indicates

the enormous complexity regarding how values, mindsets, beliefs, and, most importantly, motivations are formed within and by varied family contexts. More research is needed to understand the influence the family on the development of talent but from the perspective of the family as a complex system with multiple individuals and components set within multiple and changing broader societal contexts. We must elucidate the diversity of paths towards high achievement as well as identify the elements that are common across them. Additionally, future research needs a more nuanced framework for outcomes in adulthood, including different levels of achievement, e.g., expertise versus eminence, and different types of outcomes such as mental health and life satisfaction, since existing research suggests that varied family contexts produce or influence varied outcomes.

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10 Looking Back and Looking Forward: Curriculum for Gifted and Talented Students

Elizabeth Shaunessy-Dedrick

Abstract

Curriculum for the gifted is guided by theories of differentiated learning that emphasize advanced content, challenging tasks, and interdisciplinary learning opportunities that differ from opportunities afforded to learners not identified as gifted. Guiding models in the field of curriculum for the gifted, including the Integrated Curriculum Model, the Schoolwide Enrichment Model, and the CLEAR Curriculum Model are discussed with relevant updates to the research incorporating these models. Additionally, advances in research instructional approaches recommended for gifted learners are discussed, including problem-based learning, STEM, online mentoring, and distance learning. The role of content standards is considered, and implications for continued research in curriculum and instruction for the gifted are examined.

For decades scholars in gifted education have discussed—and at times debated—the purpose of curriculum for the gifted. Curricular efforts focused on supporting gifted learners in meeting or exceeding their potential has incorporated various educational philosophies, including three primary considerations: acceleration (Stanley & Benbow, 1983; VanTassel-Baska, 1998), enrichment (Renzulli, 1977), and differentiated instruction (Kaplan, 2005; Maker & Nielson, 1995; Tomlinson, 1999; VanTassel-Baska, 1986). While researchers have theorized about the purpose of education for the gifted and developed corresponding curricular materials to support the achievement of these educational goals, there has been some question, at times, about the value of such efforts and how well these align with the goals of the field. Over the recent years there have been calls for renewed aims of gifted education (Kettler, 2016; Subotnik, Olszewski-Kubilius, & Worrell, 2011), which have implications for curricular decisions. And while such debates are standard fare in the field, forces beyond the field also affect curricular decisions—particularly the standards movement (VanTassel-Baska, 2016), which continues to be a consideration in recent works addressing curriculum modification for gifted learners (Adams, Cotabish, & Ricci, 2014; Hughes, Kettler, Shaunessy-Dedrick, & Van Tassel-Baska, 2014; Johnsen, Ryser, & Assouline, 2014; Shaunessy-Dedrick & Hughes, 2016).

The goal of this chapter is to outline the primary philosophies and research that addresses curriculum for the gifted. Given the broad landscape of this topic, the focus in this edition will be a general overview of historical terms that guide curriculum for the gifted, recent

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developments in these areas, and new directions that have implications for curriculum development. As curriculum for the gifted refers to a vast conceptual area, this chapter focuses primarily on aspects of appropriate curriculum for the gifted as well as associated instructional approaches.

The Underpinnings of Acceleration, Enrichment, and Differentiation

Acceleration

Leda Hollingworth is credited with recognizing the advanced performance of highly gifted youth as early as the 1920s through her use of above-level testing to determine students' performance thresholds and determine appropriate educational experiences based on these assessment results (Stanley, 1990). Her work subsequently informed Julian Stanley in his development of Talent Identification programs, wherein students take above-level standardized tests, and those who score in the top percentage are invited to complete radically accelerated coursework through Talent Identification programs, such as those offered at Johns Hopkins, Duke, Northwestern, and other universities throughout the USA (Stanley & Benbow, 1983). While Talent Searches are not part of the general school curriculum for gifted learners, the theory undergirding the model—that students may know more than their age-level peers and can be accelerated in some way to curricula more aligned with their abilities—has shaped subsequent curricular practices under the larger umbrella term "acceleration," which has become synonymous with grade skipping, subject-area advancement, pacing, or other forms of upward curriculum mobility, including within-class modifications to grade-level standards included. In the curriculum model section below, the influence of acceleration will be revisited.

Enrichment

Just as Hollingworth was a forerunner in acceleration, so too did she set the pace for what an enriched curriculum might include (White, 2014). After having recognized the unique learning capacities of gifted learners based on assessing their abilities, Hollingworth considered what an appropriate education for the gifted should consist of and ultimately identified several aspects, including the broad topic of the history and evolution of culture, which she felt necessary for students to know in order to define for themselves their own place in the world and to chart a place to advance the world. Culture constituted an array of topics in Hollingworth's vision, and included food, clothing, shelter, health and sanitation, trade, timekeeping, illumination, law, government, education, science, philosophy, institutions, warfare, labor, and recreation (White, 2014, p. 15). Furthermore, students would follow a spiraling curriculum, where in successive grades they would learn—through guided and independent study involving projects—deeper knowledge and awareness of these topics throughout their schooling. It should be noted that the curriculum for the students in Hollingworth's classes not only included the above topics, but also the regular grade-level curriculum per the direction of the school superintendent. Since the early 1930s, when Hollingworth's Speyer school began, several other scholars have appreciated the concept of enrichment and embedded this into curriculum for the gifted. Of the researches in gifted education, none has embraced enrichment more than Renzulli in his Enrichment Triad Model (1977) and Schoolwide Enrichment Model (Renzulli & Reis, 1985), which are discussed below in the curriculum model section.

Differentiation

In 1961, Ward lamented that more is known about the nature of gifted individuals—their "capacities, interests, personality traits" (p. 534) than is applied in school practice. Ward articulated a vision for the education of gifted learners that advocated for vast differences in learning experiences with respect to content, process, abstraction, depth, breadth, and pace. With his vision for a guiding theory of curriculum for the gifted, he was a pioneer in his "differential theory,"

which presaged what has become more commonly known today as differentiation. His vision challenged the practices of the 1960s—of "piling on" or assigning more work and more memorization—in favor of enrichment and thematic study coupled with deeper understanding of disciplines that exceeds the typical subjects, such as history, science, and literature, to include study of logic, sociology, astronomy, and philosophy, to name a few. What Ward advanced was a theory that has greatly informed subsequent efforts to shape curriculum and instruction for the gifted so that gifted learners are afforded opportunities to become leaders in society beyond mastering content in preparation for college. His recommendations are those that continue to resonate in today's climate of high stakes testing that prizes education as a pursuit that emphasizes college and career readiness as one of the most important outcomes of education.

Over the years since Ward's statements, the landscape of research on curriculum for the gifted has evolved, with differentiation remaining a central tenet in the conversation through the decades. Despite his calls for increased investigations into the translation of what is known about gifted individuals to the classroom, the balance of the research to date continues to be heavily focused on identification and characteristics of gifted learners than on the curricular and instructional adaptations necessary to meet the unique needs of this diverse population.

About the same time that Ward (1961) advocated for differentiated curriculum for the gifted, Taba (1961) outlined general principles of curriculum development, and included discussion of how such curriculum should be designed for individuals with varying instructional needs through the promotion of individual development within a child-centered classroom that fosters creativity as well as a learner's freedom of expression, individuality, and "unique personality" (p. 28). Since Ward's (1961) calls for differentiated education for the gifted, others have responded with recommendations for the design of differentiated curricula for the gifted. In this section the concept of differentiation is explored more deeply and is illustrated through several models of curriculum for the gifted that incorporate aspects of differentiation. Research about these models and related explorations are also described.

Differentiation has continued to be a common thread in discussions about curriculum and instruction in literature to support Kindergarten through 12th-grade students served in general education classrooms—as is more commonly the case (National Association for Gifted Children [NAGC] & Council of State Directors of Programs for the Gifted [CSDPG], 2015)—or specialized settings (i.e., self-contained classrooms, clustered classrooms). Firmender, Reis, and Sweeney (2013) provide compelling evidence of the variability of learning abilities in general education classes, which speaks to the need for continued curricular modifications via differentiation for learners of all abilities. However, the components of differentiation vary depending on the theoretical model examined; VanTassel-Baska and Little (2011) describe differentiated curricula for the gifted as "adaptive to [students] needs for advancement, depth, complexity, and creative opportunity" (p. 11). Tomlinson's (1999) model of Differentiated Instruction involves modification of content, learning processes, and student products, as well as modification of the learning environment in response to student "readiness, interest, and learning profile, with the goal of maximizing the capacity of each learner" (Tomlinson, 2013, p. 287).

Others have conceptualized broader dimensions of differentiation that address gifted learners' psychological, social, and academic needs (Latz & Adams, 2011). Maker and Nielson (1995), and later Maker and Schiever (2010) recommend differentiating by altering the content, process, product, and learning environments for gifted learners. While there are several commonalities with respect to visions of differentiation, the most concrete examples of this philosophy are found in curriculum models. The following section provides a general overview of the leading models of differentiated instruction for the gifted as well as research related to the model published since the first edition of this text in 2008.

Curriculum Models

The Schoolwide Enrichment Model

One of the most widely used curriculum models is the Schoolwide Enrichment Model (SEM; Renzulli & Reis, 1985), a model that provides three types of enrichment experiences for students, including extensions of on-level content, processes for learning, and the development of student products via investigations into a student's interest area. As noted in the first edition of this book and in recent publications (Callahan, Moon, Oh, Azano, & Hailey, 2015), the SEM has a rich history of research related to student productivity, but there is a paucity of research with randomized control trials to show its efficacy with large samples of students. However, in the last several years there has been an offshoot of the SEM for reading, known as SEM-R, which provides a differentiated learning approach for reading instruction with elementary and middle grade learners. Since the publication of the first edition of this book, several studies of SEM-R have been published that show promise of the model with smaller samples in cluster randomized trials (Reis, McCoach, Little, Muller, & Kaniskan, 2011; Shaunessy-Dedrick, Evans, Ferron, & Lindo, 2015). Notably, the SEM-R offers an approach to differentiated learning with reading in classrooms that serve a range of learners, from on-level to above-level readers who are served in gifted education, and has shown efficacy in supporting advanced achievement of gifted learners while supporting the continued reading development of typical learners.

The Integrated Curriculum Model (ICM)

Vantassel-Baska (1986, 1998, 2003) conceptualized and further refined a model of differentiated curriculum that incorporates the diagnostic assessment–prescriptive instruction model undergirding the Talent Search Model developed by Julian Stanley (Stanley & Benbow, 1983; VanTassel-Baska & Stambaugh, 2008). This model is based on three interrelated dimensions that align with the gifted learner: process/product, advanced content, and issues/themes. VanTassel-Baska and colleagues have translated the ICM into a framework and several curriculum units in language arts, mathematics, science, and social studies; the units span grades Kindergarden through grade 12 (Center for Gifted Education 2008). The model is based on two theoretical sources: (a) Vygotsky's (1978) and (b) Adler (1984). Vygotsky's theory of zone of proximal development serves as the basis for above-level material in order to stimulate challenge in learning, his theory of interactionism wherein the learner engages with others to activate deeper understanding of ideas or concepts, and the theory of constructivism, wherein learners construct knowledge and understanding themselves and are accountable for their role in the learning enterprise within and beyond the classroom (VanTassel-Baska & Little, 2011).

The Clear Curriculum Model

Based on three curriculum models—the differentiated instruction model (Tomlinson, 1999), the Schoolwide Enrichment Model (Renzulli & Reis, 1985), and the depth and complexity model (Kaplan, 2005), the CLEAR Curriculum is a model that can be utilized with any content or disciplinary area to challenge gifted and advanced learners. The model includes continual formative assessment to determine appropriate student challenge based on learning growth, learning goals aligned with the NAGC (2010) field standards, authentic product development, and the incorporation of challenging content and learning experiences beyond basic skill acquisition typical in general education classrooms.

A recent work by Callahan et al. (2015) details the efficacy of the CLEAR model as tested with two language arts units for elementary gifted students in self-contained or pull-out third grade classes. Using a cluster-randomized experimental design, Callahan et al. assessed student learning in treatment and control classrooms in 3 years of

implementation in sites throughout the USA in 2010–2012 before and after the intervention. Findings indicate that there were statistically significant differences between treatment and control groups on both units, indicating there is evidence of the efficacy of the CLEAR model as a valid resource for differentiated instruction for gifted and advanced learners.

Differentiated Instruction: Teachers and Practices

To differentiate instruction, teachers may modify learning so that gifted learners have the opportunity to engage with content via appropriately tailored learning experiences, including problem-based learning, higher-level questioning, and exploration of concepts rather than facts (Vantassel-Baska & Little, 2011). Teachers of the gifted who have received training and support for implementing differentiation and who effectively adjust instruction recognize the need to challenge learners with different abilities, though these teachers constitute a small percentage of educators (Hertberg-Davis & Brighton, 2006; Latz, Speirs Neumeister, Adams, & Pierce, 2009; Tomlinson et al., 2003). While the concept of differentiation has garnered considerable attention in both the research literature and practitioner journals for several decades, evidence about teachers' practices in differentiation suggests minimal use of these approaches despite the growing body of research supporting such practices in the classroom. As the differentiation literature was early in its development, a corresponding study of a national sample of elementary classroom documented through teachers' self-reports that gifted learners rarely experienced differentiated instruction in the regular classroom (Archambault et al., 1993).

More recent research about differentiation indicates that despite increases in research about the effectiveness of differentiated instruction for gifted learners, little has changed since Archambault et al.'s (1993) study. Case in point, Farkas and Duffett (2008) investigated instructional opportunities offered to high-achieving learners by surveying 900 students in grades 3–12. Only 10% felt advanced learners were provided appropriate curriculum and instruction and only 5% of the respondents reported that advanced students received individualized support from teachers. Farkas and Duffett also learned through focus groups that educators found creating and implementing differentiated learning experiences a challenging proposition given the demands of high-stakes testing and challenges to ability grouping in classrooms.

A more recent study echoes these findings. In a yearlong exploration of nine middle school teachers' literacy practices, Roe (2010) found that teachers rarely used student assessments for instructional decisions, teachers often provided on-the-spot differentiation based on immediate needs rather than carefully considered differentiation, teachers developed learning experiences similar to state tests, and teachers focused less on learning progressions and more on student product development. And while teachers did make considerable efforts to provide differentiated learning opportunities for students needing remedial supports, only one of the nine teachers studied considered providing differentiated learning adjustments for students who had above-level reading needs.

Kanevsky (2011) recently investigated gifted and general education students' learning preferences through a survey that embedded Maker and Nielson's differentiation principles (i.e., processes, products, learning environment). In order to better understand what, if any, preferences for learning might exist among gifted students and classmates not identified as gifted, Kanevsky surveyed 646 students enrolled in a school district in Canada ($n = 315$) and the USA ($n = 331$). Based on the analysis of responses to a 110-item measure administered to students in grades 3 through 8, Kanevsky found that both gifted ($n = 416$) and non-identified gifted ($n = 230$) students, when asked to consider their favorite class, preferred a choice in (a) topics studied, (b) pace of learning, and (c) workmates. Slow instructional pacing was appraised negatively by both students identified as gifted and

students not identified as gifted, though the former voiced greater dislike of slow pacing than the latter. Likewise, gifted students expressed much greater valuation for the opportunity to grapple with complicated ideas, understand advanced issues, think like an expert, self-select assessments to demonstrate learning (i.e., products), and recognize the interrelationship of ideas. Kanevsky concluded that all students surveyed indicated relative support for various aspects of differentiated curriculum, though some curricular features appealed more to gifted students than to peers not identified as gifted.

In addition to Maker and Schiever's (2010) conceptualization of differentiation elements and practices, other scholars have described differentiation considerations to guide planning and instruction. VanTassel-Baska (2003) has emphasized the use of student assessment data to determine content mastery attained and appropriate curricular adjustments with respect to performance expectations achieved. Based on a targeted learning objective, teachers may modify a unit to fit the gifted student's needs through acceleration (i.e., pace) complexity, depth, challenge, creativity, and abstractness (Vantassel-Baska, 2003).

Accelerated learning is a common dimension of curriculum differentiation for the gifted, particularly in VanTassel-Baska's work (2003). Drawing on the talent search model developed by Julian Stanley in the 1970s (for an overview, see Assouline & Lupkowski-Shoplik, 2012), acceleration is a means of advancing learners beyond the content mastered to more challenging content. The SEM-R, for example, incorporates acceleration via text selection for above-level readers by encouraging students to select texts for independent reading based on appropriate level of challenge and student interest (Reis et al., 2011; Shaunessy-Dedrick et al., 2015). Likewise, VanTassel-Baska's ICM units call for acceleration via above level tasks, content objectives, or product development associated with content standards. Other recent works have also recommended acceleration in the design of learning experiences for advanced and/or gifted learners, including Hughes et al. (2014), and Shaunessy-Dedrick and Hughes (2016).

Developments in Curriculum for the Gifted

Mathematics Curricula

Several studies incorporate the philosophy of the learner functioning as the professional mathematician as he or she solves problems and explores the complexities of the field. The focus on the student thinking as an expert in the profession originates in the work of Renzulli (1977) and Tomlinson et al. (2009). One such curriculum began as Project M^3 (Mentoring Mathematical Minds), which targeted gifted learners in grades three through five through a combination of enrichment and acceleration (Gavin et al., 2007). The project developers created 12 curriculum units so that each grade level (3–5) would have four units each and would include content accelerated between one and two grade levels. The enrichment is achieved through problem-solving, investigations, and high-interest activities that deepen the learning experience. To promote thinking like a mathematician, students are prompted to write in journals, and to think deeply they are provided regular opportunities to examine critical mathematical concepts.

As with other curricula for the gifted, opportunities for differentiation are also embedded in the design of these units, as students may opt to pursue a given challenge or problem if they have mastered the unit content. Following an initial investigation of M^3, Gavin et al. (2007) reported that, compared to students receiving typical mathematics instruction in grades 3 through 5, those receiving the mathematics intervention showed significant gains in learning mathematics concepts addressed in project M^3. Subsequent research of the model also showed significant gains in student learning for students who engaged with this mathematics curricula, as moderate and large effect sizes were

found for learners in the treatment group compared to those in the control group (Gavin, Casa, Adelson, Carroll, & Sheffield, 2009).

Following the development of curricula for mathematically promising elementary students in grades 3 through 5, Gavin and colleagues developed mathematics curriculum units following a similar philosophy for Kindergarten through grade 2 students of all ability levels in Project M^2 (Gavin, Casa, Firmender, & Carroll, 2013). As with Project M^3, the developers sought to engage students in mathematical thinking that parallels processes that mathematicians engage in during the course of their work. In these units, the authors adhered to five core curricular features: (1) important and advanced mathematics, (2) depth of understanding and complexity, (3) differentiated instruction, (4) mathematical communication, and (5) a nurturing classroom environment (Gavin et al., 2013). The focus of these units was measurement and geometry at all three grade levels. As with the previous project, the researchers found that the M^2 curriculum did have a significant impact on student learning favoring the treatment condition, as learners who received the advanced curricula outperformed a matched sample of learners following the standard math curriculum, with large effect sizes found on an assessment that utilized open-ended response items to the measurement and geometry taught in the units.

Furthermore, even more promising outcomes were found in a study of Kindergarten students, as students receiving the M^2 curriculum outperformed students learning the traditional math curriculum on both an open-assessment and the Iowa Test of Basic Skills in mathematics (Casa, Firmender, Gavin, & Carroll, 2017). Thus, the evidence continues to mount showing the efficacy of curricular units designed to challenge young learners through accelerated content, thinking experiences mirroring those of a professional mathematician, differentiated learning opportunities, and a classroom environment that celebrates inquiry, problem-solving, and interdisciplinary connections.

Integrated Curriculum Model

While the Integrated Curriculum Model (ICM) was developed and discussed by VanTassel-Baska in 1986, others have examined the model in various contexts, including international settings. Kahveci and Atalay (2015) provide one such published report of the model in the context of a fourth grade social studies classroom in Turkey. In this phenomenological study, the authors examined gifted students' perceptions of typical social studies coursework and the unit of study in the ICM curriculum unit, which included enrichment, problem-solving, and critical thinking, which are elements of ICM and social studies in Turkey. Based on participants' responses to several open-ended questions elicited through a written questionnaire, the students indicated that they did not have positive thoughts about social studies coursework, the students' feedback about the ICM unit was markedly different from their overall views of learning social studies. The authors deduced that the majority of participants' attitudes toward social studies changed with the inclusion of the ICM unit, and they particularly liked the process of learning and problem-solving included in the unit design.

Standards as a Curriculum Consideration

Over the recent years national standards in reading, mathematics, and science have been published by leading curricular organizations. The National Governor's Association (NGA) Center for Best Practices and the Council of Chief State School Officers (CCSSO) jointly published The Common Core State Standards (CCSS) in Language Arts (2010a) and Mathematics (2010b), and soon thereafter science standards were published by Next Generation Science Standards (NGSS) Lead States (2013). These documents were developed with the goal of raising student achievement of all learners in the USA following a decades-long decline in student achievement on international assessments. The standards reflect a

notably more rigorous corpus of content and skills than had been provided in content standards prior to these publications. Each grade level of the standards provides learning progressions in learning domains such as reading literature, reading informational texts, and writing for multiple purposes (argumentation, information, narrative, and using technology) for students in grades K through 12 for the CCSS and NGSS, though there are some appended CCSS written exclusively for students in grades 6 through 12 that address writing in history/social science, technology, and science.

While the CCSS and NGSS standards are more rigorous than previously published content standards, VanTassel-Baska (2016) notes that the rigor does not equate to an appropriate curriculum for the gifted alone, and that educators should use the standards to guide the scope and sequence of learning and to allow advanced learners who have mastered on-level content to accelerate to above-level standards. Several recent texts have been published that provide guidance to educators in utilizing these standards with gifted and advanced learners through adaptations such as enrichment, problem-solving, and more complex thinking experiences than may typically be afforded to learners receiving grade-level instruction (see Adams et al., 2014; Hughes et al., 2014; Johnsen et al., 2014; Shaunessy-Dedrick & Hughes, 2016).

In addition to content-area standards developed for all learners, the National Association of Gifted Children (2010) has also published *Pre-K-Grade 12 Gifted Programming Standards*. One of the six standards focuses on curriculum and instruction and, like the other standards, is written with student outcomes in mind. For example, the first of these standards addresses **curriculum planning, such that** "students with gifts and talents demonstrate growth commensurate with aptitude during the school year" (NAGC, 2010, p. 4). Additional curricular standards include talent development, instructional strategies, culturally relevant curriculum, and resources. These standards also include associated evidence-based practices to guide educators in enacting the standards.

The National Association for Gifted Children also has a curriculum network that holds annual competitions for curriculum based on a set of curriculum guidelines that include differentiation, talent development, clarity and nature of objectives, evaluation, learning activities, instructional strategies, student products and assignments, resources and level of engagement with materials, alignment of curricular components, and evidence of effectiveness.

Talent Development

A recent discussion in the field of gifted education has also sparked debate about the purposes of gifted education and the related curriculum that fosters Subotnik et al. (2011) offered recommendations for the reimagining of gifted education such that the culmination of the learning experiences is eminence, arguing that while the goal of self-actualization would be a likely byproduct of eminence, self-actualization itself should not be the primary goal of gifted education. In order to cultivate eminence, they argue, gifted education must focus on embedding learning experiences that would prepare gifted individuals to manage the nuanced psychosocial dimensions of the path toward eminence. Specifically, they recommend that "one of the functions of a good teacher is to offer appropriate psychosocial strength training in addition to the information specific to the talent domain," and go on to lament that educators who work with gifted learners have little to no systematic preparation in providing this "dimension of differentiated instruction" (Subotnik et al., 2011, p. 25) that is a regular part of the preparation of elite athletes in terms of managing stress, identifying and evaluating goals, and self monitoring one's progress toward goal achievement. While Subotnik et al. recognize the limitations of a school day in supporting the full development of an individual's talent trajectory, the authors suggest that awareness of the development process, achievement of benchmarks in progress toward performance goals, and commensurate

cognitive support will be addressed along the educational continuum, including within schools but likely also extending outside of the traditional school day to supplemental training or coaching by one skilled in the identified talent domain.

The suggestion that K-12 educators do play a role in the learner's talent development is notable, though an important takeaway from Subotnik et al.'s (2011) work is that further consideration of the support of talent—via psychosocial strengths training—is needed in a learner's curriculum at all stages of learning and in each learning context. Given this call for attention to psychosocial strengths training in gifted education, the field can consider how to develop such training, how the training might differ based on the talent domain, and how to assess the efficacy of such training in the curriculum. In a more recent work, Olszewski-Kubilius, Subotnik, and Worrell (2016) offer suggested curricular considerations that may promote the development of talent, including creativity training as a regular part of learning rather than as an added feature when time permits; domain-specific training for younger students who identify specialized interests and abilities in a given domain; and interdisciplinary learning such that traditionally separated subjects are less distinct and more connected within the study of other disciplines. Additionally, Olszewski-Kubilius et al. recommend dedicated preparation in the development of psychosocial skills, including the delay of gratification, emotional regulation, recognition of flow states in pursuit of one's selected talent domain, independent learning, and acquisition of coping skills to manage potential setbacks.

Developments in Research on Instructional Approaches with Gifted Learners

Problem-Based Learning

Problem-based learning (PBL) has been discussed as a viable means for learning with gifted students, especially since this approach embeds elements of learning that have historically been cited as components appropriate for this population, including complexity, student-centered learning, inquiry, and experiential learning (Gallagher & Gallagher, 2013). While the promise of PBL has been heralded in the literature, few empirical studies with gifted learners have been published documenting the effectiveness of this approach (Horak & Galluzzo, 2017). To address this paucity of research, Horak and Galluzzo (2017) investigated the effects of a PBL science unit with middle school learners attending schools with center program for highly able students in a mid-Atlantic state. Horak and Galluzzo compared gifted students' academic achievement and attitudes toward learning before and after the delivery of a 3-week environmental unit—the district's teacher-centered, hands-on curriculum taught by three educators at one site offering a center program for the gifted, and the PBL unit taught by three other teachers at a different school that also offered the same center program. Following the examination of pretest and posttest academic achievement test scores and attitudinal scales, Horak and Galluzzo found that students in the PBL group outperformed their gifted peers receiving the traditional curriculum, and students in the PBL perceived that unit allowed for more choice than the unit rated by students in the control group. The authors concluded that this study provided sound evidence for the benefits of student-centered, inquiry-driven learning with gifted learners.

Robinson, Dailey, Hughes, and Cotabish (2014) also provide empirical support for the use of problem-based curricula in the teaching of science to gifted elementary students in grades 2 through 5. Students and teachers were randomly assigned to the intervention condition, which consisted of teacher training in using problem-based learning to encourage scientific thinking, peer coaching, inquiry-based curricular units that embed real-world problem-solving and advanced scientific concepts, as well as a curriculum centering on biographies of scientists. Students in both the treatment and control classrooms were identified as gifted students attending schools serving learners from low-income

backgrounds. Findings comparing treatment and control students' content, process, and concept knowledge in science indicated statistically significant differences favoring treatment students. While the analyses showed positive effects of the intervention, the authors noted that the study sample size warranted future research with larger groups of students to fully test the model. Regardless of the sample size, the results are promising given the lack of empirical research in science with gifted learners, particularly those from low-socioeconomic backgrounds.

Online Tools and Gifted Students

With the ubiquity of online learning, developments in online learning experiences for students who are gifted have also emerged. Renzulli and Reis (2012) describe Renzulli Learning, an online portal that extends the Schoolwide Enrichment Model to learners within and beyond schools, allowing students to develop deeper content and conceptual learning and extend learning into student-selected projects and interests. Another partially online learning experience integrating mathematics and technology with arts for Canadian middle-school learners is described by Gadanidis, Hughes, and Cordy (2011). Thirty-two gifted students engaged in a 6-week study of mathematics, art, and technology that began and ended with a full-day of face-to-face mathematics instruction followed by 6 weeks of online group discussion and research related to concepts examined during the first meeting. Gadanidis et al. found that while the participating students as a group were successful in mathematics, they did not especially learning math in school due to the narrow scope of learning activities typically offered. The participants did, however, report enjoying the online learning provided through the short-term interdisciplinary unit, particularly since it challenged and deepened their thinking, involved the use of technology tools for drawing, and fostered creative thinking. Notably, the authors recognized much greater participation and interest among students during the face-to-face meetings than in the distance-learning experiences that followed. Gadanidis et al. offer several recommendations for future mathematical units that integrate art and technology, most of which focus on the content of the unit, benefits of using graphic tools in instruction, and the depth and complexity a unit of this nature offered.

In yet another online learning development, Böhmová and Roštejnská (2009) provide an overview of a unique learning opportunity for gifted adolescents in the Czeck Republik and the Slovak Republic. Offered through Charles University in Prague, gifted students enrolled in a distance-learning course in Biochemistry and Natural Compounds that afforded participants the opportunity not only to complete coursework online, but also to develop a chemistry project at home, meet with an expert in the subject area, and defend the findings of project. The course offered students individualized feedback, the opportunity to learn content beyond what was offered in their school curriculum, and challenged them to think more deeply and work on a focused project for an extensive period of time. The authors conclude that this type of coursework of optional out-of-school enrichment, coupled with individualized feedback from an expert, and embedding a culminating project—was an appropriate learning experience for the majority of course completers.

While these descriptive works involving distance-learning opportunities have shown a marked advance in options for gifted learners for a decade now, future research efforts may extend this research to examine the long-term academic and social-emotional outcomes of learners who experience such opportunities, either as compulsory learning connected with school or as optional learning experiences outside of the school day. Given the widespread use of technology worldwide, such research can guide subsequent effort to inform educators and researchers about the effects of these technologies on the lives of gifted learners.

While there is a paucity of research related to content acquisition via online learning for gifted learners, a more promising and well-designed line of research has emerged related to online mentoring for gifted girls in the area of Science Technology, Engineering, and Mathematics (STEM) in Germany. Stoeger, Duan, Schirner,

Greindl, and Ziegler (2013)) and Stoeger et al. (2016)) examine program pairing a female STEM professional with a gifted girl. Based on their findings from this exploration, Stoeger, Hopp, and Zeigler (2017) examined whether group mentoring—involving two STEM female mentors with two gifted girls—was more effective than one-on-one mentoring in engaging girls' interests in STEM. Stoeger et al. compared the "STEM-related communication behavior, STEM-related networking, and changes in elective intentions" (Stoeger et al., 2017, p. 246) of gifted girls in group mentoring to the findings of one-on-one mentored girls in a previous study. In each of the studied areas, group mentored girls had positive statistically significant differences. The authors assert that the positionality of the gifted girls in a network—with more voices and more connections to like-minded individuals discussing STEM issue—fostered the greater frequency of written dialogue, more frequent communication, and more changes in elective plans.

Opportunities for Continued Research and Curricular Developments

During the last 10 years there has been significant developments affecting curriculum for the gifted, including the development of a new curriculum model (Callahan et al., 2015), further evidence of the need for differentiation based on documented variability of learner abilities in general education classrooms serving gifted students (Firmender et al., 2013) and through examination of classroom practices (Roe, 2010), continued development and research of mathematics curricula for the gifted (Casa et al., 2017; Gavin et al., 2009; Gavin et al., 2013), the replication of research showing the efficacy of a differentiated reading approach (Reis et al., 2011; Shaunessy-Dedrick et al., 2015), and calls for the inclusion of psychosocial strengths training of gifted learners in their quest for eminence (Subotnik et al., 2011). Most of these efforts coincided with a renewed emphasis on curricular rigor as articulated in the CCSS (2011) and NGSS (2013).

While the above advances certainly address critical issues in gifted education, conspicuously absent in the literature is an emphasis on curricular issues specific to students of color, students from low socioeconomic backgrounds, and students with disabilities, though certainly these considerations are embedded within several of the works referenced in this chapter (see Callahan et al., 2015; Firmender et al., 2013; Gavin et al., 2013; Latz & Adams, 2011; Latz et al., 2009; Reis et al., 2011; Robinson et al., 2014; Shaunessy-Dedrick et al., 2015; VanTassel-Baska & Stambaugh, 2008). Looking ahead to the possible third edition of this book—in 2028—I anticipate these underrepresented groups will be the focus of several works yet to be undertaken. Additionally, with the emphasis on the new standards, I anticipate we may see research that documents the effect of these on student learning, including the outcomes of students who are gifted. And finally, keeping with the continued discussion that Subotnik et al. have fostered with their proposed new directions in gifted education, I anticipate that the field will see advances in research addressing curricular modifications so that gifted learners are afforded learning experiences that include stress management, colleagiality, self-monitoring, and other dimensions of psychosocial skills to enhance strengths in these and related constructs.

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11 Applicable Federal and State Policy, Law, and Legal Considerations in Gifted Education

Kristen R. Stephens

Abstract

This chapter provides an overview of the history of federal legislation that has influenced gifted education and presents the current status of gifted education policies in the USA. The legal processes that parents can use in seeking appropriate identification and services for their children are discussed along with a synthesis of case law pertaining to gifted education. The chapter concludes with an examination of the role of the Office for Civil Rights in resolving disputes and the presentation of several issues that may shape the future of gifted education policy.

Introduction

"National attention to the recognition and development of gifted persons is intermittent, unevenly distributed, and inadequate in amount" (p. 1). This statement comes directly from a report issued by the White House Task Force on the Education of Gifted Persons under Lyndon B. Johnson's presidency in 1968; however, these words still hold true nearly 50 years later.

Once gifted children enter school, their parents soon realize the lack of accommodations that are available to address their children's unique educational needs. With no federal protection under the law and with permissive legislation in many states, gifted children are not afforded the same safeguards as those children protected under the Individuals with Disabilities Education Improvement Act of 2004 (IDEA).

Some parents have been compelled to take legal action in pursuing appropriate accommodations for their children. However, with limited, if any, protection under the law, schools typically prevail in such litigation. Frustrated and disgruntled, parents often seek relief by switching schools, homeschooling, and even in some extreme cases, relocating.

Why are the academic development and social-emotional nurturance of our nation's brightest students continuing to be neglected? Why has interest in this special population been so sporadic? These questions have persisted over the years as federal and state interest in gifted students has fluctuated.

Federal Policy in Gifted Education

Federal attention to gifted education can be viewed as a pendulum which swings from interest to disinterest depending on the degree to which the nation feels vulnerable (Cohen, 1996).

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For example, many in the field of gifted education (Delisle, 1999; Gallagher, 2013; Haensly, 1999; Roberts, 1999; Stewart, 1999) have cited the launching of Sputnik by Russia in 1957 as a pivotal point in turning the federal government's interests toward increasing achievement levels of highly capable students in math and science. This phenomenon was clearly impacted by national uncertainty and discomfort or mere "fear and embarrassment" in trailing Russia in innovation (Delisle, 1999, p. 30).

Over the years, several key pieces of legislation have had both direct and indirect consequences for the gifted and talented. Educational reform movements, economic decline, and global competition have all driven legislation pertaining to gifted education at one point or another. A discussion of pertinent legislation follows.

National Science Foundation Act of 1950

Several years prior to Sputnik, Congress passed the National Science Foundation Act (1950), which provided federal support for research and education in math and science and created the National Science Foundation (NSF). Today, NSF continues to play a critical role in supporting research and promoting science and engineering education at all levels. At the core of NSF's mission is the belief that "[n]o single factor is more important to the intellectual and economic progress of society, and to the enhanced well-being of its citizens, than the continuous acquisition of new knowledge" (NSF, 2005, ¶ 6). This mission is aligned with current views in the field of gifted education in that the educational needs of our brightest students need to be nurtured to ensure the competitiveness of the USA in a global society.

National Defense Education Act of 1958

The National Defense Education Act of 1958 was a direct result of the launching of Sputnik. The focus of this legislation was on identifying students gifted in math, science, and modern foreign languages.

As efforts to "sift and sort" (Eilers, 2004, p. 4) through students to find talent increased, so did school counselor programs. The legislation included money to develop school counselor training programs at universities and provided funds to both colleges and public schools to employ counselors. As the commotion spurred by Sputnik dissipated, so too did the interest in supporting programs that benefit gifted students.

Elementary and Secondary Education Act of 1965

The first and largest federal education legislation is the Elementary and Secondary Education Act (ESEA) of 1965. With an emphasis on students from low-income families, ESEA was originally authorized through 1970, but has been reauthorized (with some recent exceptions) every 5 years since its enactment. Though the legislation has undergone many changes since its inception, the basic premise of the law still exists today and ensures that students from disadvantaged circumstances have access to quality public education. Subsequent legislation pertaining to gifted and talented students have been including in amendments to ESEA.

Task Force on Gifted Persons of 1968

In 1967, President Lyndon B. Johnson commissioned a task force to study and make recommendations regarding the nation's capacity to identify and encourage citizens capable of making extraordinary contributions to the country. The task force considered the loss to society should such individuals be deprived the full development of their talents. Their report made the following recommendations to the President regarding what the federal government should do:

1. Direct the Secretary of Health, Education, and Welfare to establish a center for the Development of Exceptionally Talented Persons.

2. Appoint a National Advisory Council on the Development of Exceptionally Talented Persons—composed of men and women of high attainment in representative spheres of American life, both public and private.
3. Elicit the cooperation of the private sector in talent development efforts.
4. Convene a meeting of leaders in elementary, secondary, and higher education (including representatives of such specialized institutions as musical conservatories and schools of art).

Some of the recommendations of the task force have been realized. For example, in 1972, Dr. Julian Stanley initiated the first talent search at Johns Hopkins University by identifying seventh and eighth graders talented in math and science using the SAT (Swiatek, 2002). Today, four such regional talent searches exist and are based on Stanley's model for identifying academically talented youth and providing educational programs commensurate with their advanced abilities (Duke University's Talent Identification Program, the Center for Talented Youth at Johns Hopkins University, the Center for Talent Development at Northwestern University, and the Rocky Mountain Talent Search at the University of Denver). Additionally, the participants in Stanley's initial talent search spawned the beginnings of a 50-year longitudinal survey—the Study of Mathematically Precocious Youth (SMPY)—which studies the impact of various educational options on the development of gifted youth.

The task force's report is filled with compelling statements that are still applicable today:

> …many of those who constitute the creative minority in our society have achieved their eminence in spite of, rather than because of, our educational system. (p. 9)
> One may wonder how many great achievements have been lost to our society because brilliant individuals succumbed to conformity in an inflexible school system where scholastic measurements dominated all other indices to individual possibility. (p. 18)
> …identifying superior ability must be a continuous process of investigating many possibilities at once in all children from early ages through the whole period of their development. (p. 22)

Marland Report of 1972

US Commissioner of Education Sidney P. Marland's report to Congress in 1972 marks the first paradigm shift in the gifted education movement. Prior to his report, the nation was focused on recognizing gifted students as a group and providing them with a one-size-fits-all program to nurture their academic potential. The Marland Report shifted the existing paradigm to one focused on assessing each individual child and designing an educational program specifically tailored to his or her needs, much like the paradigm that exists for special education today (Cohen, 1996).

Marland's report to Congress included some appalling statistics regarding the state of gifted education and provided the first federal definition of the gifted and talented:

> Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:

1. general intellectually ability
2. specific academic aptitude
3. creative or productive thinking
4. leadership ability
5. visual and performing arts
6. psychomotor ability. (Marland, 1972, pp. 13–14)

Education Amendments of 1974 (P.L. 93–380)

In 1974, President Gerald Ford signed P.L. 93–380, which included provisions for gifted and talented students under the Special Projects Act. This legislation established an Office of Gifted and Talented at the US Department of Education; created a National Clearinghouse for the Gifted and Talented; offered support through grants to states and local education agencies (LEAs) for gifted education programs; and provided grant monies for training, research, and model programs in gifted education. A mere $2.56 million per year for 3 years was appropriated for the program, and though funding was less

than originally requested ($12.25 million), its passage was "a victory for gifted and talented education" (Harrington, Harrington, & Karns, 1991, p. 35).

Education of All Handicapped Children Act of 1975 (P.L. 94–142)

Enacted in 1975, P.L. 94–142 serves as the foundation for special education. Under this legislation, a free and appropriate public education (FAPE) was mandated for children with disabilities. In addition, such students were ensured due process rights, education in a least restrictive environment, and individualized education plans (IEPs). Though gifted students were not specifically included in this legislation, some states do afford gifted students some of the same due process protections and rights to IEPs.

Gifted and Talented Children's Education Act of 1978

Establishing a separate category for gifted and talented education under Title IX of ESEA, the activities of the Gifted and Talented Children's Education Act of 1978 did not vary significantly from those under the Special Projects Act of the Education Amendments of 1974. However, the definition of gifted students was altered slightly.

> The term "gifted and talented" means children, and whenever applicable, youth who are identified at the preschool, elementary, or secondary level as possessing demonstrated or potential abilities, that give evidence of high performance capability in areas such as intellectual, creative, specific academic, or leadership ability, or in the performing and visual arts and who by reason thereof require services or activities not ordinarily provided by the school. (Section 902)

Though similar to Marland's 1972 definition, three major differences exist. First, specific reference to children and youth across periods of development (e.g., preschool, elementary, secondary) are highlighted in the 1978 definition. Second, "psychomotor abilities" are noticeably absent from the 1978 definition because many equate "psychomotor abilities" with athletics, an already well-funded area in schools (Harrington et al., 1991). Third, this new definition indicates that gifted students require specialized services.

The Gifted and Talented Children's Education Act of 1978 was subsequently repealed when President Ronald Reagan signed the Omnibus Budget Reconciliation Act of 1981. As a result, the Office of Gifted and Talented was closed and authorizations for gifted education were combined with 29 other programs into a single block grant (Russo & Ford, 1993). Continued economic decline in the 1980s stifled gifted education efforts until 1988 with the passage of the Jacob K. Javits Gifted and Talented Students Education Act.

Jacob K. Javits Gifted and Talented Students Education Act of 1988

As concern regarding mediocrity in the US educational system returned, so too did interest and support for gifted and talented programs. Named for Senator Jacob Javits of New York, the Jacob K. Javits Gifted and Talented Students Education Act (Javits) emerged as Congress began focusing on reforming America's school systems. After much debate between Congress and the House, the Javits bill was included as part of the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988. Javits, with initial funding set at $7.9 million, reestablished the Office of Gifted and Talented in the US Department of Education, established a National Research Center (currently housed at the University of Connecticut and the University of Virginia), and provided funds for training teachers and for programs serving the gifted and talented. Program priorities of Javits have gravitated toward economically disadvantaged gifted students, limited English proficient students, and gifted students with disabilities.

Though Javits continues to be a significant piece of legislation for gifted education, Russo

and Ford (1993) have identified two major shortcomings. First, Javits fails to mandate the creation of programs to serve gifted students, and second, it does not include any of the procedural due process safeguards that are afforded to students with disabilities under IDEA.

Javits' funding has fluctuated from year to year since its inception with an allocation of $0 from 2011 to 2013 to a high of $12 million in 2016. In recent years, the majority of available funds have been designated for continuation awards. At the time of this writing, plans are underway for a 2017 competition, but the program appropriation for FY 2017 is yet to be finalized.

National Excellence: A Case for Developing America's Talent (1993)

In 1993, the US Department of Education's Office of Research and Improvement released the National Excellence report. At a time when educational reform efforts were focused on increasing rigor, this report helped to further substantiate the "quiet crisis" that many of America's youth were working well below their full potential (US Department of Education, 1993, p. 5). National Excellence also provided yet another definition for gifted students.

> Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment.
> These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools.
> Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (p. 3)

For the first time, a definition of the gifted and talented addressed variances in how giftedness manifests across different cultural and socioeconomic groups, bringing attention to the need for better methods to identify such students.

No Child Left Behind Act

Signed into law on January 8, 2002, by President George W. Bush, the No Child Left Behind Act (NCLB) had many unintentional consequences for gifted students. The most sweeping educational reform initiative since the initial ESEA, NCLB redefined the role of the federal government in K-12 education. Based on four principles—"stronger accountability for results, expanded flexibility and local control, expanded options for parents, and an emphasis on teaching methods that have been proven to work" (US Department of Education, 2003, ¶ 1)—many experts in the field of gifted education feel that NCLB gave schools every incentive to ignore the needs of gifted students.

Under NCLB, states were required to demonstrate that every child was performing on grade level. Therefore, it can only be expected that schools would expend most of their resources on bringing low-performing students up to proficiency by the imposed 2014 deadline. Those students already meeting or exceeding established standards (as is the case for many gifted students) were left waiting for a challenging, accelerated curriculum that addressed the advanced content they were ready to learn.

Gallagher (2004) indicates that NCLB reinforced the principle driving educational policy for decades: equity. Though it is noble to assure "that every child has an equal opportunity to profit from education" (p. 121), we must not forget the second principle, excellence, by "creating conditions for all students to perform at the limits of their capabilities" (p. 121).

Individuals with Disabilities Education Improvement Act of 2004

The passage of the Individuals with Disabilities Education Improvement Act of 2004 marked the ending of a 3-year reauthorization process of IDEA and the first update to this significant legislation in 7 years (Klotz & Nealis, 2005). A key provision of the new legislation impacting gifted students is the elimination of the requirement to

use the aptitude–achievement discrepancy model in identifying students with disabilities in favor of the use of Response to Intervention (RtI), an approach that uses ongoing classroom assessments to identify students performing below grade level and then provides educational support to students through research-based interventions (Robertson and Pfeiffer, 2016).

Advocates fear that the elimination of the requirement to use the aptitude-achievement discrepancy model may cause many twice exceptional learners to go unidentified. The National Association for Gifted Children (NAGC) expressed that "… gifted students with disabilities may appear 'not impaired enough' for disability-related services if they perform at grade level and 'not gifted enough' to receive gifted education services." (NAGC, 2013, ¶ 4)

It should be noted that while states may still accept the discrepancy model as a means for identifying students with disabilities, they are no longer required to use it as before.

Every Student Succeeds Act

The Every Student Succeeds Act (ESSA) is the 2015 reauthorization of the Elementary and Secondary Education Act of 1965 (formerly called NCLB). ESSA marks the first time that the needs of gifted and talented students are explicitly addressed in federal education law through (1) changes in the use of Title I and Title II funds, (2) changes in state and local report cards, and (3) a new provision that allows states to use computer adaptive assessments for accountability purposes.

Title I

ESSA allows Title I funds to be used to identify gifted students in poverty and provide appropriate programming and services for these students. Title I funds can also be used to purchase assessments designed for English language learners or to hire gifted education specialists to support classroom teachers in Title I schools.

Title II

ESSA requires that states address in their Title II grant applications how they will provide professional development opportunities for teachers and other school leaders on identification of and instructional methods for gifted learners. Districts receiving Title II funds must address the needs of gifted and talented students.

State and Local Report Cards

Under ESSA, states are required to report student achievement by level of achievement and disaggregate these data by group. This new reporting requirement help reveal disparities between and within subgroups, even among those at the highest achievement levels.

Computer Adaptive State Assessments

ESSA allows states to used computer adaptive assessments for accountability purposes. Such assessments will be of particular benefit to gifted learners as the measure of mastery above grade level provides more accurate insight into a student's readiness level.

State Policy in Gifted Education

For the most part, policy development in gifted education has been restricted to identification and programming issues (VanTassel-Baska, 2000). Though establishing policy in gifted education is an important and laudable goal, policy itself is not the final solution in resolving issues in educating gifted students. Policy should serve as a point of departure, giving school systems something to work with, but also allowing them some flexibility in applying identification and programming methods that are most effective for the students they serve. In contrast, policies that are too permissive can do more to hamper than help gifted education initiatives. Finding a balance is crucial.

Though the federal government can establish parameters that guide state educational policy, states have considerable leeway in setting their own policies that directly impact the education of gifted students. A disparity in services for gifted

students exists across states, with some states having well-developed, sound policies regarding gifted students, while others have limited, if any, policies. Zirkel (2016) reports that between 2005 and 2015, six states (Colorado, Delaware, Indiana, Maryland, Minnesota, and Ohio) significantly strengthened their state laws for gifted education while four states (California, Hawaii, Utah, and Mississippi) weakened their state laws.

State of the States Report

The *State of the States Report* (NAGC, 2015) is a publication of the Council of State Directors in Gifted Education and NAGC. It provides a biannual summary of the status of gifted education across individual states. The 2014–2015 state responses to the State of the States questionnaire reveals several themes: Decentralized decision-making and limited accountability, limited service options, the importance of professional development, the influence of federal education law, and funding issues.

Decentralized Decision-Making and Limited Accountability

Although decentralization gives states the freedom to respond to the specific needs of their population, it can also unintentionally create a wide disparity in services within and across states.

Data from the questionnaire reveal: (1) 32 states mandate the identification of gifted students, with eight of these not providing funds to support this mandate; (2) 11 states require LEAs within their state to follow a standard identification process; (3) 17 states have at least one full-time staff member dedicated to gifted education; and (4) only 18 states require LEAs to submit gifted program plans.

Limited Service Options

State laws and policies vary greatly regarding the types of services that are offered to gifted students. For preK and Kindergarten, regular classroom delivery was the top service delivery model noted by states with cluster classrooms being the top delivery model for grades 1–5. In middle school, honors and advanced coursework ranked as the top delivery model while Advanced Placement (AP) courses were the most cited delivery model for high school students. Additionally, only seven states have specific policies that permit early entrance to kindergarten, 28 states have policies permitting students to be dually enrolled in high school and college, and 19 states permit proficiency-based credit/promotion with seven permitting the use of these credits toward high school graduation.

The Importance of Professional Development

The inability of many regular classroom teachers to effectively provide programming for gifted students is a direct reflection of the lack of training in gifted education most teachers receive, both preservice and in-service. Only one state (Nevada) requires all preservice candidates to take a separate course in gifted education. Only five states require professional development in gifted education for general education teachers. While 19 states require endorsement or certification in gifted education for those teachers working in specialized programs for gifted students, only four required coursework in the nature and needs of gifted students for school counselors.

The Influence of Federal Education Law

In the absence of a federal education law for gifted students, decisions are left to the states, who often delegate authority to the LEAs. Most states responding to the survey viewed the lack of consideration for gifted students in federal education law as very to slightly negative. When asked how they thought federal policy could benefit gifted students and their families, all responding to the question believed federal attention to the needs of gifted learners could increase the accountability for student learning.

Lack of State Funds

Funds to support gifted and talented education are continually threatened as the security of education budgets fluctuates. Annual state funding amounts for gifted education range

from $150,000 (Idaho) to $157.2 million (Texas) with 12 states spending $0 on gifted education. While some states fund gifted education by mandate, others offer discretionary funding based on application, or provide monies to all LEAs as part of general funding to districts. It is then up to individual schools and districts as to how they choose to utilize the funds.

The Legal Process and Gifted Education

While federal and state legislation have established policy regarding the education of gifted students, court cases and administrative hearings are another source of policy development (Gallagher, 2002). However, when there is a dispute between a family and a school, it is recommended that dispute resolution begin at the lowest level possible, with litigation being a final consideration. Negotiation, mediation, and due process are all alternate avenues to litigation in resolving disputes.

Negotiation

Negotiation is the informal process by which parties discuss a problem in an effort to reach a compromise. Typically, negotiation begins at the level where the dispute arises, which is often the classroom teacher (Karnes & Marquardt, 1997). If negotiations at this level are unsuccessful, parents may choose to meet with others up the administrative ladder—the principal, the superintendent, or even the school board.

To prepare for the negotiation process, parents must be well informed regarding the state and local rules, regulations, and policies that govern identification and programming for the gifted. Karnes and Marquardt (1997) also advise that parents keep detailed records of all meetings and correspondence with school and district personnel during the negotiation process. If negotiation is unsuccessful, mediation may be the next course of action.

Mediation

Mediation is a voluntary, nonadversarial process that allows disputing parties to meet with an impartial, third party facilitator to reach an agreement. In the 1997 reauthorization of IDEA, states were mandated to offer mediation as an option to individuals requesting a due process hearing.

According to the 2014–2015 *State of the States Report* (NAGC, 2015), mediation is available for issues involving gifted education in seven states. Some states afford gifted students the same rights to mediation as those students who qualify for services under IDEA while others require mediation for gifted students under state law separate from IDEA.

Provisions regarding mediation cited in the 1997 amendments to IDEA include:

1. Mediation must be voluntary and not delay or deny a parent's request for a due process hearing.
2. A qualified, impartial mediator who is trained in effective mediation techniques must conduct the mediation.
3. The state must maintain a list of qualified mediators who are knowledgeable in the laws and regulations regarding the provision of special education and related services.
4. The mediator must be selected at random from a list or the parties may agree on the selection of a qualified mediator.
5. The mediation sessions must be scheduled in a timely manner and held at a location convenient to both parties.
6. Discussions that take place during the mediation process must be confidential and may not be used as evidence in any subsequent due process hearings or civil proceedings.
7. The mediated agreement must be put in writing.
8. All costs related to the mediation process are the responsibility of the state (IDEA, 1997).

There are many advantages in using mediation to resolve conflicts.

1. Reduced Cost: While mediation costs vary from state to state, they rarely exceed $1500, which is far less expensive than due process.
2. Expeditious Process: The mediation process is usually completed within 20–30 days. Mediation sessions are typically scheduled within a few weeks of filing and most disputes are resolved with only 1 day of mediation.
3. Improves Relationships: Mediation helps reconcile differences between disputing parties and assists in enhancing communication.
4. Collaborative Resolution: In due process, decisions are made by a third party, and one or both parties may be unhappy with the outcome. In mediation, the participants themselves develop collaborative resolutions.
5. Confidential: Issues discussed in mediation remain confidential and cannot be admissible in any future legal proceedings.
6. Empowers Participants: Both parties determine who the participants are, who the mediator will be, where and when the mediation sessions will occur, and contribute to the creation of the final agreement.
7. Allows for Flexibility: Because mediation sessions are not limited by issues of law, parties can develop new, creative options that benefit the child (Bar-Lev, Neustadt, & Marshall, 2002).

Both federal and state governments, encouraged by the effectiveness of alternative dispute resolution mechanisms, continue to provide financial support through legislation to establish mediation opportunities (Karnes, Troxclair, & Marquardt, 1998). However, if an agreement cannot be reached through mediation, then the next step, if available, is due process.

Due Process

Due process is a procedure by which an aggrieved party has an opportunity to be heard by an impartial hearing officer. Due process hearings have several common requirements across states. These include the following:

1. Timely notice to all parties involved that a hearing has been scheduled.
2. Opportunity to present evidence, witnesses, and oral arguments to an impartial hearing officer.
3. Opportunity to have counsel present.
4. An oral or written record of the proceedings.
5. A written decision from the hearing officer based on the arguments presented at the hearing (Karnes et al., 1998).

Locating hearing officer decisions is not an easy process. There is no federal mandate for the collection of such data (Ahearn, 2002). Furthermore, most states retain confidentiality of proceedings by deleting the names of the children, parents, and hearing officers involved. The 2014–2015 *State of the States Report* (NAGC, 2015) reveals that 12 states (Alabama, Arkansas, Florida, Georgia, Kansas, Louisiana, Maine, North Carolina, Oklahoma, Pennsylvania, Tennessee, Wisconsin) offer gifted students and their families the right to due process.

The National Association of State Directors of Special Education (NASDSE) reports that in 1999 and 2000 the total number of special education due process hearings *heard* declined, even though the total number of hearings *requested* increased (Ahearn, 2002). Since the 1997 amendments to IDEA require that states inform parties of the availability of mediation, it may be reasonable to assume that many individuals requesting due process hearings end up resolving their disputes through other avenues, like mediation (Karnes, Stephens, & McCard, 2008). The number of due process hearings heard is likely to continue to decline as the availability of other dispute resolution strategies increases (Ahearn, 2002).

Regardless of the availability of alternate dispute resolution strategies, parents report the need for increased information and support about hearing and complaint procedures (Opuda, 1999). Parents also desire assurances that the due process system will not harm their long-term relationships with schools, as many may fear retaliation against their children by the school because of their use of the due process system

(Opuda, 1999). Such fears may deter parents from utilizing any dispute resolution mechanism.

Litigation

As mentioned previously, litigation should be the last option pursued, as it is the most costly and time-consuming method for resolving a dispute. Court cases have addressed a wide range of issues such as tuition reimbursement, admissions, early entrance, appropriate programming, and compensation, to name a few.

Zirkel (2004, 2005, 2009, 2016) suggests that when reviewing case law regarding gifted students, two distinct categories should be considered: (1) "gifted alone," those students eligible for gifted education without any other special legal protection, and (2) "gifted plus," those students who are gifted, but are also eligible for other federal, legal protections (e.g., students with disabilities under IDEA, and minority gifted students under Title IV of Civil Rights Act).

In both instances "gifted alone" and "gifted plus," decisions have favored school districts regarding gifted education provisions, particularly in those states with permissive gifted education legislation. In "gifted plus" cases, courts have tended to focus on a child's disability rather than his or her academic or intellectual strengths (Zirkel, 2004). For the purpose of this chapter, "gifted alone" cases are explored.

Federal Court Decisions

When cases involve constitutional or statutory challenges, the federal courts become involved. In *Student Doe v. Commonwealth of Pennsylvania* (1984), a plaintiff claimed that the use of an IQ test to exclude her from the gifted program violated the equal protection and due process clauses of the US Constitution. The court dismissed the complaint and concluded "that use of a minimum cutoff score might not be the best procedure available but that the court could not conclude that such a method cannot be reasonably used" (Pennsylvania Department of Education, 2004, p. 58).

In *Student Roe v. Commonwealth of Pennsylvania* (1987), parents raised various statutory and constitutional challenges after their child, who scored 121 on an IQ test, was denied entrance into the gifted program. The court found that Pennsylvania's minimum cutoff score for eligibility into gifted programs did not violate the equal protection or due process clauses of the Fourteenth Amendment (Pennsylvania Department of Education, 2004).

State High Court Decisions

Two seminal cases regarding gifted students with contradictory outcomes are *Broadley v. Board of Education of the City of New Meridian* (1994) and *Centennial School District v. Commonwealth Department of Education* (1988). Subsequent courts have relied on the rulings from these two cases in reaching decisions.

Centennial was the first case involving gifted education to reach the state high court level. A school district in Pennsylvania objected to a hearing officer's decision requiring that they provide an appropriate individualized education program to a gifted student, apart from enrolling the student in the district's existing enrichment program. The hearing officer had concluded that the student needed not only enrichment, but also acceleration in certain subject areas. The high court affirmed the hearing officer's decision, indicating that regardless of an existing enrichment program, the district was not relieved of the responsibility of providing the student with an appropriate academic education (Stephens, 2000).

In *Broadley*, the second case involving gifted education to reach a state's high court, the Supreme Court of Connecticut found that the state's constitutional right to a free public education does not afford gifted students the right to special education.

The decisions of these two cases reflect the importance of state statutes that protect gifted students. The *Centennial* case occurred in Pennsylvania, a state that affords gifted students similar provisions as those protected by IDEA.

In contrast, the *Broadley* case occurred in Connecticut, where there is a state mandate for identifying gifted students, but not a mandate for providing gifted students specialized programs (Stephens, 2000).

Tuition Reimbursement

Parents often look to colleges and private schools for appropriately challenging coursework for their gifted child. Thus, they have sought reimbursement from public schools to cover tuition for such learning experiences. Courts have generally ruled on the side of school systems, indicating that a district should not be required to offer coursework and services above and beyond their existing curriculum. Two Pennsylvania cases that demonstrate the courts' standing on tuition reimbursement for the gifted are *New Brighton Area School District v. Matthew* (1997) and *Ellis v. Chester Upland School District* (1994).

In *New Brighton Area School District v. Matthew*, the court held that a school district should not have to pay for transportation or college courses beyond the district's current curriculum, because it would be more than a free appropriate public education. Though the state's regulations required each school district to create an IEP, it did not require the school district to act beyond the scope of their existing curriculum.

Likewise, in *Ellis v. Chester Upland School District*, the court held that gifted students were not eligible for reimbursement of expenses resulting from tuition or transportation to attend private schools. The decision also indicated that the curriculum available to a gifted student need not maximize the student's ability, but is only required to provide an appropriate program for the student.

In *Levi v. Connell* (2006), a California Court of Appeals found that the California Department of Education was not required to pay the college tuition of a highly gifted 16-year-old student. The court based the decision on the fact that "giftedness" is not an exceptionality addressed by the Individuals with Disabilities Education Act and IDEA is limited to PreK-12 education and does not guarantee a free and appropriate college education specifically tailored to a student's individual needs.

Admissions

A New York case clearly demonstrates the importance of statutory law in litigation involving the gifted. In *Bennett v. City School District of New Rochelle* (1985), a father argued that his child's constitutional rights were violated after his child was not selected, via a lottery, to participate in the gifted program. The school district had identified 109 students who were eligible for the gifted program, but only had sufficient funds to allow 37 students to participate in the program. The district chose to conduct a lottery drawing among the qualifying students to determine which students would enroll in the program. The disputing father cited a New York statute that stated, "school districts of this state should develop programs to ensure that children reach their full academic potential" (Karnes & Marquardt, 1991, p. 45). The use of the word "should" instead of "shall" in the statute served as the basis for both the trial and appellate courts' rejection of the father's argument. In addition, the court indicated that New York law did not require districts to offer gifted programs, thus school systems were not obligated to offer such programs.

In *E.N. v. M. School District* (2007), a Pennsylvania appellate court ruled in favor of the school district. The parents of a first grader argued for their child to be admitted into the gifted program based on a score of 131 on the Kaufman Brief Intelligence Test–Second Edition (KBIT-2) and a 124 on the Wechsler Intelligence Scale for Children–Fourth Edition (WISC-IV). However, IQ was only one piece of the multiple criteria used by the district to determine gifted program eligibility. The court reasoned that the district's decision to not admit the student was consistent with the regulations which afforded the district discretion based on multiple criteria.

In 2013, parents in New York City argued that a sibling preference policy for admission into the gifted and talented program violated the Equal

Protection clause of the New York State Constitution. The court favored on the side of the district noting that classification based on "lineage" is not a "suspect" class. The district need only demonstrate a rationale basis for its admission policy regarding sibling preference, which they had done to the satisfaction of the court (*R.B. v. Department of Education of the City of New York,* 2014*)*.

Early Entrance

Parents of young children have struggled to secure early entrance into school. Regardless of their efforts, states, for the most part, have left early entrance decisions to the judgment of local school boards. In *Wright v. Ector County Independent School District* (1993), a parent sought admission for her 5-year-old into the first grade, despite the Texas Education Code requirement that a child be at least 6 years of age. The court held that the Texas Education Code was intended to grant school boards discretion regarding the admission of underage and overage children, and the district's policy to exclude admission to the first grade to those children age 6 or older was within the board's discretion.

In Wisconsin, the state's highest court rejected parents who sought early admission to kindergarten for their gifted child (*Zweifel v. Joint District No. 1, Belleville*, 1977). The court found the matter to be at the discretion of the school board, and that the district's policy requiring students to be 5 years old "was not an abuse of this discretion" (Zirkel, 2005, p. 7).

Compensatory Education

There have been contradictory outcomes regarding whether gifted students are entitled to compensatory education. A legal term, compensatory education describes future educational services that courts provide students as a result of being denied a free and appropriate education (FAPE).

The court discussed the remedy of compensatory education in *Brownsville Area School District v. Student X* (1999). Compensatory education was found to be an appropriate remedy for gifted children whose district failed to provide them with an adequate program that ensured they were afforded a free appropriate public education. However, compensatory education was limited to the education that was available within the school district's curriculum. As a result, the court held that an appeals panel could not require, as compensatory education, college-level instruction, private tutoring, or any education beyond that currently offered by the school district.

In *Abington School District v. B.G.* (2010) , a court reversed a hearing officer's decision that a district had denied FAPE to a third grader gifted in mathematics by not providing adequate goals and services in math. The court reasoned that since the parents had attended the meetings and agreed to the goals and objectives set forth in the IEP, they cannot now argue the goals were insufficient (Zirkel, 2016).

A hearing officer's failure to award compensatory education was upheld by the courts in *D. C. v. Kennett Consolidated School District* (2011), as it was determined that the district had provided a gifted seventh grader with a free and appropriate education. The court also found that since Pennsylvania's gifted education law (Chapter 16 of Title 22) was silent as to which party bears the burden of persuasion in a dispute, the court found that general administrative law procedures should apply, thus placing the burden on the moving party (the parents). The court found the parent's arguments that the district had failed to differentiate instruction for the student without merit.

By contrast, in *York Suburban School District v. S.P.* (2005) the court ruled that the school district was required to provide an education that conferred sufficient educational benefit on the student and was tailored to the student's unique needs by means of an IEP. The court held that the school district's failure to attempt to customize coursework to a student's needs amounted to a failure to provide an ade-

quate IEP, and entitled the student to an award of compensatory education.

The methods by which compensatory education is calculated has also been challenged. In *C. N. v. Neshannock Township School District* (2010), parents requested the court blend the formulistic (hour-for-hour) and flexible (exercise of discretion to elevate student to the status they would have reached in the absence of the district's failures) approaches for determining compensatory education. The court declined the parent's request for a blended model favoring the flexible approach. This case demonstrates that in the absence of a standard in Pennsylvania law for determining compensatory education, courts look to federal circuit court decisions for guidance; however, these circuit court decisions have had varying results.

Appropriate Programs

The largest volume of court cases pertaining to the gifted involve the delivery of appropriate services and educational program options. In two of the three cases discussed here, all from Pennsylvania, school systems have prevailed.

In *Central York School District v. Commonwealth of Pennsylvania, Department of Education* (1979), a school district, having lost their case at the due process hearing level, appealed to the Commonwealth Court of Pennsylvania. The district argued that its duty to provide programs to gifted students was contingent on reimbursement from the state for the cost of such programs. The court rejected this argument, citing that the provision of programs for the gifted "was a condition to its right of reimbursement rather than vice versa" (Zirkel, 2005, p. 9).

In another case, parents of a gifted high school student challenged the district's IEP for their son on the grounds that it did not provide a math course, an area in which their child had exceptional talent (*Scott S. v. Commonwealth Department of Education*, 1986). The district argued that the student had already exhausted all the school's math courses, including the school's most advanced course, Calculus B.C., where he had earned a grade of B. The parents requested that the district offer a classroom course in math beyond Calculus B.C. or reimburse them for the cost of a college calculus course. The school district argued that the student's acceleration in math had been to the detriment of his other coursework and that his IEP was appropriate. Citing the Centennial case, the court sided with the district, stating, "a school district is not required to devise an educational program which makes the best use of each student's abilities, but only to identify exceptional children and develop educational programs appropriate to their particular needs" (Centennial, 1988, p. 1094).

A change in gifted program options from the elementary to the middle school was the subject of another case prompting a parent to demand that his daughter receive an independent evaluation at the district's expense and that he be reimbursed for his attorney's fees pursuant to IDEA (*Huldah A. v. Easton Area School District*, 1992). The court affirmed the special education appeals panel's decision, which indicated that gifted children do not fall under the protections of IDEA; therefore, the Plaintiff was not entitled to an independent evaluation at the school district's expense or the reimbursement of attorney fees.

Synthesis

It is interesting to note that the large majority of case law regarding gifted students derives from Pennsylvania, a state that affords gifted students many, but not all, of the same state and federal protections as those students covered under IDEA. Other states that regard gifted students in the same manner are Alabama, Florida, Kansas, Louisiana, New Mexico, Tennessee, and West Virginia (Zirkel, 2005). However, Pennsylvania remains the most active state regarding court cases and administrative hearings pertaining to gifted students.

An analysis of all cases involving gifted students reveals that there are far fewer "gifted only" than "gifted plus" cases (Zirkel, 2004, 2005,

2016). As such, there is a lack of legal precedence for "gifted only" students. The lack of legal precedence, the absence of a federal mandate, and permissive, if any, state legislation regarding the educational rights of gifted students, have all hampered parents through the litigation process and have resulted in decisions that have mainly favored school districts.

Multicultural/Diversity Issues and Considerations

Office for Civil Rights

Some parents resort to the filing of complaints with OCR when they feel that their child is being discriminated against on the basis of race, color, national origin, sex, disability, and age in programs and activities receiving federal assistance. OCR works to ensure equal access to education and to promote educational excellence across the USA. Most of the complaints filed with OCR regarding gifted students pertain to Title VI compliance (nondiscrimination on the basis of race, color, or national origin) and involve underrepresentation of minorities in gifted education programs.

Four separate studies have analyzed OCR findings regarding gifted students. Karnes and Marquardt (1994) reported 48 letters of OCR findings regarding gifted students from 1985 to 1991. From 1992 to 1995 there were 38 letters of OCR findings involving gifted students (Karnes et al., 1998), from 1996 to 2005 (Karnes et al., 2008) 56 letters of OCR findings were reported regarding the gifted, and from 2006 to 2012 there were 25 letters of OCR findings dealing specifically with gifted education issues (Stephens, 2017).

In addition to investigating complaints, OCR works in other ways to represent and protect gifted students from underserved populations. For example, in 2000, OCR collaborated with a state educational agency to ensure that all students with outstanding abilities had access to gifted and talented programs. OCR helped the state determine that some districts were misinterpreting the provisions in the state identification guidelines. To rectify the problem, OCR was asked to participate in a statewide conference for gifted and talented program coordinators and provide them with information on how to evaluate their policies and procedures to ensure that all students have equal access to gifted programs (OCR, 2000).

In 2002, OCR commissioned a study by the National Academy of Sciences (NAS) entitled *Minority Students in Special and Gifted Education* (Donovan & Cross, 2002). This report examines the reasons why minority students may be underrepresented in programs for the gifted and makes recommendations for early intervention and changes in referral and assessment procedures.

Future Issues

Advocacy

The role of an advocate is perhaps more crucial with the gifted than with any other population of exceptional student. While parents and teachers have often served in this capacity, psychologists, school counselors, and others who provide mental health and related services to gifted students and their families must take on this role at times.

Parents often look to those who assess or test their children for guidance and advice. Gilman (2006) indicates that testers should serve as advocates for the child and should be able to write a report that emphasizes a child's strengths as well as weaknesses so that appropriate educational accommodations can be accessed. More importantly, assessment results help substantiate the requests that parents make to schools regarding programs and services for their child. Gilman states that it "tempers our conjectures with empirical analysis and allows us to arrive at meaningful conclusions" (p. 11) regarding a student's needs.

Psychologists, school counselors, and other mental health professionals need to be knowledgeable about the educational needs of gifted

students. Such knowledge helps such professionals better assist gifted students and their families as they seek access to appropriate programs in their home schools.

Reform

The title of Tannenbaum's 1988 monograph, *The Gifted Movement: Forward or on a Treadmill*, captures the essence of what continues to frustrate gifted education advocates. While it is apparent that some progress has been made in the field, it is also evident that there is still much work left undone. There are several areas that must be improved if gifted education is to move forward.

A Consistent Definition

There must be a collective agreement regarding how the gifted are defined. At present, numerous definitions exist constructed by a variety of entities (e.g., educational agencies, organizations, experts in the field), and they all explore the concept of giftedness from multiple perspectives. The importance of having a universally agreed upon definition is critical for maintaining consistency in how the nature and needs of gifted students are communicated with the general public. Without such a definition, advocacy efforts are considerably weakened (Stephens, 2006b).

In formulating a definition, the fundamental purpose or use of the definition should be considered. For example, how giftedness is articulated to a psychologist may be very different than how giftedness should be portrayed to a policymaker. Subotnik, Olszewski-Kubilius, and Worrell (2011) suggest moving away from the whole child approach to conceptualizing giftedness (which may be more palatable to educators, psychologists, and counselors) and toward a more outcome-based approach. Though this shift in perspective has been met with some controversy, Plucker (2011) acknowledges that an outcome-focused definition is more powerful within a policy context when the goal is to sway legislators.

Unite Forces

Gifted education advocates have, for the most part, worked independent of other education initiatives. Lone organizations and individuals have made tireless efforts to get both federal and state governments to support separate legislation for gifted students. As new educational policies are developed, regardless of their specificity to the gifted, supporters of gifted education need to shout, "Me too!" (Stephens, 2006a, p. 3). Brown and Garland (2015) suggest leveraging general education policy to benefit gifted students. Though some state and federal education policies may not be explicitly directed toward gifted students, they can still have positive implications for gifted students.

Public Relations

Myths and misconceptions have permeated society's perceptions of the gifted. Linda Gottfredson (2006) indicates that "Americans have always been ambivalent about talent: insisting that individuals should be able to advance as far as their abilities and effort take them but resenting those who outdistance everyone else" (p. 10).

It should be emphasized that the general public has a negative view toward the gifted, "not just benign indifference" (Sternberg, 1996, p. 168). According to Sternberg, many signs of society's prejudice against the gifted exist, such as the following:

1. Instability of the Javits Act from year to year.
2. Absence of funding for programs for the gifted.
3. Lack off legal protection for the gifted.
4. Phenomenon that gifted programs are the last programs to be put into place when money is available and the first to be eliminated when funds are scarce.
5. Occurrence that many parents of gifted students have given up on public schools and have enrolled their children in private schools.
6. Lowering of educational standards in many American schools whereby students can exert little effort to receive A's.
7. Unavailability of research and coursework regarding the gifted in the field of psychology.

How does one change public attitude and perceptions about a group who are viewed as "one of the loudest and least deserving" (Sternberg, 1996, p. 171)?

Sternberg suggests that society needs to observe the following:

1. View the gifted as a valuable natural resource.
2. Acknowledge multiple kinds of giftedness.
3. Recognize alternative learning and thinking styles.
4. Take thinking and learning styles into account in teaching and assessing students.
5. Support serious research and development on the gifted that puts theory into practice.
6. Enhance and expand programs for the gifted.
7. Evaluate existing programs to determine what works.
8. Urge congress and the president to support gifted learners.
9. Determine what the message is and communicate why supporting gifted learners is important.

Changing public perceptions and dispelling existing myths regarding the gifted is a surmountable task, but one that is necessary to garner public support. The need for organized public relations strategies in gifted education is evident in the numerous articles that have been written over the years (Besnoy, 2005; Karnes, Lewis, & Stephens, 1999; Karnes & Riley, 1991; Troxclair & Karnes, 1997). However, most of these articles have been addressed to teachers of the gifted. Parents, regular education teachers, administrators, counselors, psychologists, and other stakeholders must also advocate on behalf of the gifted to assist in changing public perceptions and organizing support.

Summary and Conclusions

Treffinger and Sortore (1994) assert that a paradigm defines "the orthodoxy or standard accepted views and practices of a field" (p. 40). The field of gifted education has progressed through three distinct paradigms. Cohen (1996) highlights the three paradigm shifts that have occurred in the gifted education movement:

Paradigm 1: Identify gifted individuals as a group (usually through IQ tests) and provide them with a one-size-fits-all program.

Paradigm 2: Programs and services are identified and developed and students are assigned to certain services based on their assessed needs.

Paradigm 3: Focus on potential for excellence and the development of many talents through multiple methods. Shift from the individual benefit of such programs to societal benefit.

Each of these paradigms is evident in how federal and state governments have responded to the needs of the gifted throughout history. In addition to the paradigms that are reflective of the social policies of the time, policy development in gifted education has been driven by world events, perceived crises, and even the economy. As a result, a reactive rather than a proactive approach to addressing the needs of gifted students has ensued.

Without a federal mandate for gifted education, the identification and availability of programs and services for gifted students is left to each individual state. Furthermore, few, if any, court cases have served to set legal precedence in how the needs of gifted students should be addressed in schools.

Gallagher (2002) states, "Public policy almost invariably reflects some of the fundamental values of the American society, and this is particularly true of the policies dealing with gifted students" (p. 7). As such, the debate between the values of *excellence* and *equity* persists in American schools. Those favoring equity believe that educating gifted students is "contrary to equity principles" (p. vii) and those supporting excellence feel that individual accomplishments are crucial to the development of society. Furthermore, Gallagher (2013) purports that *excellence* is a long-term goal whereas *equity*, due to its categorization as an immediate crisis, is perceived as a short-term goal. Short-term goals (*equity*) often take priority, and resources are often depleted before long-term goals (*excellence*) can be realized.

Swanson and Lord (2013) suggest the need to "harness the power of policy" (p. 217) to ensure gifted students are afforded high-quality opportunities. This "harnessing" is accomplished

by (1) staying abreast of developments in the field of gifted education, (2) deliberately assessing the impact of gifted programs on students, and (3) cultivating relationships with influential political leaders.

So, is gifted education moving ahead or stuck on the treadmill? It appears that many of the same policy issues from the twentieth century have been carried over into the twenty-first century for resolution. Identification (particularly of underrepresented minorities), placement, differentiated programming, program evaluation, and teacher support and development all continue to be works in progress. Gifted education must remain a "hot" issue among policymakers, so the unique educational and social-emotional needs of gifted learners will continue to be recognized and sustained in the years to come. As Resnick and Goodman (1994) so eloquently state:

> Gifted young people have emerged over the past century and a half, more as a challenge to the organization of the American system of education than as a special resource to be developed. … A way must be found to turn the constraints of the past into the opportunities of the present. (p. 118)

Resources

Websites

Center for Gifted Education Policy (CGEP)
http://www.apa.org/ed/schools/gifted

Housed in APA's Education Directorate, CGEP generates public awareness, advocacy, clinical applications, and cutting-edge research ideas regarding children and adolescents with special gifts and talents.

Consortium for Appropriate Dispute Resolution in Special Education (CADRE)
www.directionservice.org/cadre

Provides technical assistance to state departments of education on implementation of the Individuals with Disabilities Education Act procedural safeguards provisions and dispute resolution systems.

Davidson Institute's State Gifted Education Policies
http://www.davidsongifted.org/Search-Database/entryType/3

Provides information about respective state policies in gifted education.

National Association of State Directors of Special Education
www.nasdse.org

Organization that helps state agencies promote and support especially designed instruction and related services for children and youth with disabilities.

National Research Center on Gifted and Talented Education (NRC/GT)
http://nrcgt.uconn.edu

Funded by the Jacob K. Javits Gifted and Talented Students Education Act, NRC/GT is a nationwide cooperative of researchers, practitioners, policymakers, and other persons and groups that have a stake in developing the performance and potentials of young people from preschool through postsecondary levels.

State of the States Report
http://www.nagc.org/resources-publications/gifted-state/2014-2015-state-states-gifted-education

A biannual snapshot of how states regulate and support programs and services for gifted students.

US Department of Education's Office for Civil Rights
www.ed.gov/ocr

Ensures equal access to education and promotes educational excellence throughout the nation through enforcement of civil rights.

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12 Assessment of Giftedness

Linda Kreger Silverman

Abstract

The purpose of assessment of giftedness is to determine a child's special needs. The misuse of testing in selecting students for gifted programs has undermined confidence in IQ tests. Individual IQ tests administered by skilled professionals are essential for children who develop atypically. Qualitative information informs the interpretation of IQ tests, confirming or disconfirming test results. Subtests and composite scores with the richest loadings on general intelligence (***g***) are the most useful for locating gifted children. Rigid cutoff scores based on Full Scale IQ scores are incongruous with modern, multifaceted theories of intelligence.

Sharing that one is an assessor of the gifted does not win points at cocktail parties. IQ testing has always had its detractors (e.g., Block & Dworkin, 1976; Gould, 1981; Murdoch, 2007). "Indeed, with the possible exception of evolution, no area in the sciences has been as filled with emotional and confusing mixtures of science, politics, and philosophy as the field of mental testing" (Carroll & Horn, 1981, p. 1012).

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Curiously, the assessment of children with special needs is not the same minefield. In special education, ability testing is generally accepted as a lens for pinpointing strengths and weaknesses and determining appropriate educational and therapeutic responses to the child's needs. The importance of "early intervention" is emblazoned on the minds of psychologists and educators worldwide. Early intervention entails early identification—as early as possible. Federal funding is allocated for locating children before school age who have special needs.

Gifted children are another special needs group. "Assessment and identification of gifted children and adolescents…is in the interest of providing for the educational needs of these special children and adolescents" (Sparrow, Pfeiffer, & Newman, 2005, p. 281). The consensus of authors of measures of giftedness is that such children can be identified accurately before school age (Valler, Burko, Pfeiffer, & Branagan, 2017). When a child develops atypically, identification and assessment are important in and of themselves to gain understanding of the child's needs. This is prudent regardless of whether there are special programs available that use the information for selection purposes.

My background is in special education and educational psychology. I see gifted education as a legitimate branch of special education. So does the Council for Exceptional Children. When gifted education is removed from special

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education, the rationale for assessment is not as clear. The number of twice exceptional children (gifted with learning disabilities) underscores the connection between these two disciplines. Estimates of the incidence of twice exceptional (2e) children in the US school population range between 300,000 and several million (Silverman, 2013). During the first 10 years of Gifted Development Center (GDC), when our services were sought primarily to determine if children qualified for schools for the gifted or university enrichment programs, one-sixth of our clients had learning disabilities, sometimes not revealed until the assessment (Silverman, 1989). Now, nearly four decades later, the vast majority of our clients are 2e. Interest in the 2e population has mushroomed worldwide. Diagnosis of learning disabilities usually involves IQ testing. One rarely mentioned reason for assessing the gifted is to rule out hidden learning disabilities.

Throughout this chapter, I use a special education lens to examine assessment and identification practices in gifted education. As a special needs group, the gifted should have their methods of assessment taken just as seriously as all other children with special needs. A "primary rationale and justification for gifted assessment in the schools" is to determine the "*need for special educational programs or resources not presently available in the regular classroom*" (Pfeiffer, 2015, p. 3, italics in original). This rationale echoes the purpose of assessment for all other children with special needs.

In this chapter, I discuss why assessment of the gifted is important, how assessment differs from selection for gifted programs, hidden giftedness in culturally diverse and economically disadvantaged children, comprehensive assessment, factors that make assessment of the gifted unique, rapport building with children and parents, Qualitative Assessment, the impact of theories of intelligence on IQ, and *g*-loadings on various versions of IQ tests. Age factors, test selection, interpretation of test profiles, posttest conferences, and elements of a good report all are addressed. Few psychologists realize that there are norms for expanded composite scores in *WISC-V Technical Report #1* (Raiford, Drozdick, Zhang, & Zhou, 2015), designed specifically with the gifted in mind. A new "Gifted Index" for the WISC-V is introduced (Silverman, Raiford, and Falk, 2017). The challenges of assessing twice exceptional children are touched on, although a thorough treatment of this topic is beyond the scope of this chapter.

Why Is Assessment of Giftedness Necessary?

Assessment of giftedness began in the early part of the twentieth century, before there were programs for gifted students. Stemming from the psychological study of individual differences, the original purpose of testing was to understand children who developed atypically in either direction. One hundred years later, this is still the most important reason for comprehensive evaluation. The further the child veers from the norm, the greater the urgency for an individual assessment to obtain concrete information about the child's needs. One cannot assume that the child will be fine with no accommodations or differentiation at school and no support at home.

This principle is easier to understand if we first examine the other end of the intellectual spectrum. Children are designated mildly, moderately, severely and profoundly intellectually disabled based on standard deviations (SD) from the norm. Standard deviations are not just statistical artifacts. They represent levels of functioning. At 1 SD (85 IQ), often considered "slow learners," children are in the regular classroom with support. At 2 SD (70 IQ), the mildly impaired level, developmental differences are so great that children qualify for special education services. Individual IQ tests are administered to children 2 SD below the norm as an essential component of comprehensive assessment. In adult life, they are generally capable of gainful employment (Spruill, Oakland, & Harrison, 2005). At 3 SD (55 IQ), the moderately disabled level, children may only be able to function in a regular classroom with a

radically modified program and the assistance of an aide. They usually require assistance and supervision in nearly all aspects of daily living (Spruill et al., 2005). At 4 SD (40 IQ), the severe level, children may not be in the school at all, but in a separate facility learning self-help skills. They are unable to function independently (Spruill et al., 2005). At 5 SD (25 IQ), the profound level, individuals are unable to care for their own needs (Spruill et al., 2005). Atypical development affects all aspects of a child's life—at home as well as at school. The parents have responsibility for the child's welfare 24/7 and need support.

Developmental advancement is the flip side of developmental delay. Mirroring degrees of intellectual disability, there are degrees of giftedness: mild, moderate, high, exceptional and profound. Children 1 SD above the norm (115 IQ) have the ability to be high achievers and to obtain college degrees. The mildly gifted range begins at 1 1/3 SD (120 IQ), at the 91st percentile. For the last century, IQ tests have referred to the 120–129 IQ range as "superior" (which, unfortunately, infers that lesser IQ scores are "inferior"). Recently, the descriptive categorization for this range has changed to "high" (Elliott, 2007) and "very high" (Wechsler, 2014). The National Association for Gifted Children (2010) defines giftedness as the top 10% of the population. Roughly equivalent to the "superior" range, children of approximately 119 IQ or higher comprise the pool addressed in most talent search models. Similar to the support needed at 90 IQ, these children need differentiation and enrichment opportunities.

At 2 SD (130 IQ), the moderately gifted range, the magnitude of developmental differences warrants the label "special needs." As with children 2 SD from the norm at the other end of the spectrum, assessment is vital to understanding and meeting their needs. At 3 SD (145 IQ), the highly gifted range, it becomes significantly harder to find friends and to remain engaged in the regular classroom. At 4 SD (160 IQ), the exceptionally gifted range, the child is likely to experience isolation and feel strange. With no special provisions, school becomes endless boredom and forced underachievement. At 5 SD (175 IQ), the profoundly gifted range, adaptation becomes so difficult that many beg to be homeschooled. Profoundly gifted children are as different from the norm as the profoundly disabled. Without assessment, there is no recognition of their differences, and children with staggeringly atypical developmental patterns are left completely on their own to figure out how to cope (See Table 12.1).

Table 12.1 Levels of giftedness

Level	IQ range	Standard deviations
Profoundly gifted	above 175	+5 SD
Exceptionally gifted	160–174	+4 SD
Highly gifted	145–159	+3 SD
Moderately gifted	130–144	+2 SD
Mildly gifted (superior)	120–129	+1.33 SD

Adapted from Wasserman (2013), p. 338

The fundamental principle of early intervention also applies to the gifted. Bloom (1985) contended that early intervention is essential to the development of talent. Children who are developmentally advanced and reading early are often eager for early entrance to school. Educators commonly claim that IQ scores for young gifted children are inaccurate, that they are the result of good preschools and how many books the parents read to the child. They argue that scores for 9-year-olds represent children's abilities, rather than their environmental advantages. Who has had more environmental advantages: a 4-year-old or a 9-year-old? Environmental privileges are cumulative. Some assert that early reading is insignificant—the other children will "catch up" by third grade. The only way average children catch up to gifted children is by slowing down the advanced ones. The educational goal should not be for everyone to learn at exactly the same rate. This defies the laws of child development.

Gifted children can be assessed at age 4 or 5 for placement decisions, but tests for 6-year-olds usually have higher ceilings than tests for younger children. This is particularly true for the Wechsler scales. Due to insufficient item difficulty of IQ tests, gifted 9-year-olds pass some of the hardest items on several subtests (Gilman, Kearney, &

Silverman, 2009), so their composite scores do not reflect the full strength of their abilities. More accurate estimates of ability are possible before the age of 9. Ironically, ignoring the ceiling effects of the tests, many schools do not assess gifted children until age 9.

The greater the degree of exceptionality, the earlier is the need for assessment. Early identification enables parental support with the issues that present at home as well as at school. However, with so little awareness of the existence of exceptionally gifted children, it does not occur to parents to bring them for assessment until they are miserable at school. Karen Rogers conducted a postdoctoral study of 241 exceptionally and profoundly gifted children tested at GDC between 1979 and 1995. These children all scored at or above 160 IQ (4 SD above the norm). The main purpose for the assessment indicated by 82% of the families was to determine placement in educational programs (Rogers & Silverman, 2001). The assessment, however, did much more than that. It enabled parents to make sense of their children's loneliness, existential questions, and difficulties fitting in. Parents wished they had had this information earlier so that they could have understood their children better when they were younger. Through the assessment, they were able to find a support group of other parents, and to locate true peers for their children. The evaluation proved to be life changing.

Assessment is an essential part of the process of deciding if a child should be accelerated. Is this child a good candidate for early entrance? For grade acceleration? Grade placement decisions are often determined by testing the child's IQ and achievement. Feldhusen, Proctor, and Black (1986) recommended that children who are considered for grade advancement should have an IQ score of at least 125 (95th percentile) and "demonstrate skill levels above the mean of the grade desired" (p. 26). In practice, since there is such resistance in the schools to grade advancement, few children are grade-skipped unless they are highly gifted (99th percentile). Subject acceleration is more common for children who demonstrate advancement in a specific subject area—usually mathematics.

Perhaps those most in need of assessment are the hidden gifted. The gifted are the one exceptionality who can camouflage so well as to become indistinguishable from others. The "invisible ones" include children of color, girls, second born children, rural children, children of poverty, second language learners, those who are not gender identified, introverts, visual-spatial learners, underachievers, and the twice exceptional (Silverman, 2013). Hidden giftedness is revealed through individual assessment.

School psychologists once had the opportunity to unveil giftedness in children of low socioeconomic circumstances. Rita Dickinson (1970), a school psychologist in the Denver Public Schools, found an equal distribution of gifted children in all socioeconomic levels. Some of the children referred for disrupting the class turned out to be gifted. Half of the children she documented as gifted through individual IQ tests were not doing well in school. For every child who was noticeably gifted, at least one other gifted child went unrecognized. She discovered that when parents did not realize their children were gifted, neither did their teachers. Dickinson identified and studied thousands of gifted children from disadvantaged schools. This is the untold story of the good outcomes for underprivileged children that came from the era of routine IQ testing in the schools.

The Marland Report (1972), which recognized gifted children federally for the first time, stated that their identification required objective measures administered by qualified professionals. As a result, school psychologists were hired to administer individual IQ tests in public schools to locate gifted children. Times have changed, values have changed, and we have thrown out the baby with the bathwater. The opportunity for gifted children to be assessed in schools has all but disappeared. While many states require multiple criteria for admission to gifted programs, only 13 states mention IQ scores as one of the accepted indicators of giftedness (NAGC & CSDPG, 2015). School psychology services are dwindling in public schools, and few school

psychologists work with the gifted. One survey found that only 6% of school psychologists assess gifted children more than once per month and "94% of the participants received either little or no training in gifted screening and assessment" in their graduate programs (Robertson, Pfeiffer, & Taylor, 2011, p. 790).

Comprehensive assessment, by professionals who understand giftedness, can yield a tremendous amount of useful information. Testing can guide grade placement, help a child find true peers, lead to scholarships, affect aspirations, and open doors to opportunities for the development of a child's gifts.

Assessment Versus Selection for Gifted Programs

The requirements for acceptance to programs for the gifted has been the driving force behind testing the gifted for far too long. This has led to questionable practices in assessment. There is a world of difference between identifying gifted children for programs (you are either in or out) and the assessment of children with special needs. Following a college admission model, gifted children undergo testing, but the test data are never used to determine the child's program. In special education, the purpose of testing is to collect information about the child's strengths and weaknesses that will be used as a basis for programming. This is equally important for the gifted (VanTassel-Baska & Baska, 1993). There is frequently no relationship between the measure used for determining placement in a gifted program and the actual characteristics of the program. A nonverbal measure may make the gifted program more accessible to children who have other than verbal gifts, but if the program is highly verbal, the children will not succeed. There needs to be a match between criteria for acceptance and the type of program offered.

The misuse of IQ tests in the selection of students for special programs and schools has obscured the true value of assessment. Some private schools offer IQ tests for a minimal fee. Parents receive a printout of scores with no interpretation. The child cannot be tested again on that instrument for a full year. The sole purpose of the testing is to see if the child qualifies for admission. If the child is accepted, the IQ test gets filed in a drawer, never looked at again to glean information about how the child learns best. It is puzzling why parents would pay a few hundred dollars for minimal testing to determine if their child can get into a school for the gifted that costs more than $20,000 per year. Before making that kind of investment, wouldn't they want to know as much as possible about the needs of their child to see if the school is a good fit rather than just if the child qualifies?

Giftedness in one state does not guarantee that designation in another state. Some school districts do not acknowledge children who are identified as gifted in other school districts. Some districts determine who is gifted by the number of children they feel is needed to fill a classroom. Children who are near-gifted are placed in the class to warrant hiring a teacher. With this logic, a child could be gifted in one school in the district, but not in another. Can you imagine if such guidelines were used in special education? "We don't have enough kids to fill this special education class so we are going to drop you into the class. You're close enough." Schools would be in court within the week. Identification of a child with special needs has serious implications. Methods of identifying the gifted are frivolous.

Educators frequently say, "We can't afford individual IQ tests." Group tests or brief screeners are considered sufficient. Would they be sufficient to identify a child as intellectually disabled? "Because individual IQ tests are different from group IQ tests, they will invariably yield different IQ scores for the same person" (Kaufman, 2009, p. 144). Wasserman (2013) described the problems he observed supervising group ability test sessions for gifted program eligibility. Young children often skipped an item on the bubble sheet so that each answer was displaced by one. Some "impulsively established a mistaken response set without having carefully listened to (what are often overly lengthy) test directions" (p. 328). Some tests do not explain time limits. Children are bewildered when the time is up.

Anxiety can interfere with performance. There is no opportunity to provide feedback or to adjust the situation for the individual. Noise levels, distractions, reduced flexibility, difficulty controlling proctor variables (e.g., accents) all affect gifted children's performance.

I was invited to speak to gifted coordinators from all school districts in one state because so few children of culturally diverse or low socioeconomic backgrounds were qualifying for placement. Every district plan required that students demonstrate high ability on a group IQ test **and** high performance on a group achievement test. It was right after Passover, and, likening myself to Moses, I said I had a message for them from a Higher Power: "Change **and** to **or**." Districts in search of equity need to recognize that there are multiple pathways for demonstrating giftedness. Children should not be required to be gifted in all of them.

In some districts, the child must receive a teacher recommendation before gaining access to testing. Bias in teacher referrals is one cause of minority underrepresentation (Wasserman, 2013). Teachers untrained in the characteristics of the gifted are likely to overlook many truly gifted children, especially those from marginalized groups. Culturally diverse gifted children may not demonstrate their abilities in ways that teachers readily recognize. Some are very quiet in class or do not give eye contact to adults. In some cultures, if one child in the classroom is called on and does not answer a question, no other child will raise a hand. It would be unthinkable to embarrass a classmate. Some cultures are not competitive; it is not appropriate to stand out. This may be particularly true for girls.

Hidden gifted children may show their unusual abilities at home, but not in school. The child who acts as the translator for the family, who takes care of younger children, who is the problem solver in the neighborhood, who mediates conflict in the peer group, who shows strong persistence in difficult tasks, who is a path finder with unusual visual-spatial talent, or who is extraordinarily curious, may clam up in a school setting. Teachers do not recognize giftedness in children of poverty as easily as they spot high achievers from privileged environments. Being shabbily dressed and frequently late for school can impact teacher judgment of a child's abilities. Children who raise their hands frequently are perceived as brighter than sideliners who simply watch. A child who questions and corrects the teacher is not as likely to be nominated for a gifted program as a child who is a teacher pleaser.

There needs to be limitless access to the pool of children being considered for gifted programs. Anyone should have the right to nominate an advanced child: the music teacher, the librarian, after-school caretakers, the custodian, the secretary, parents, peers, and the children themselves, through self-nomination. Access to free gifted assessment should be available to all and highly publicized. A program such as Child Find is needed to scout for children of promise in daycare centers, preschools, churches and community centers.

When students are selected for gifted programs on the basis of achievement tests, grades and teacher recommendations, programs are likely to miss children who are economically disadvantaged, who have few books in their homes, and fewer role models for achievement. Individual ability tests provide greater access to programs for diverse cultural groups and children of low socioeconomic status (Silverman & Miller, 2009). It is true that IQ tests miss many legitimately gifted children. But then, so does every method of identification. There is no perfect way to identify this population that finds every single gifted child (Pfeiffer, 2015). No alternative method has demonstrated greater predictive validity in identifying the gifted. "The use of intelligence tests is a core tool, and justifiably so. In terms of reliability and validity, standardized intelligence tests are usually the most psychometrically sound instruments available" (Sparrow et al., 2005, p. 295).

IQ test results, however, should not be used as the sole arbiter in high stakes decision-making (Rimm, Gilman, & Silverman, 2008). Rigid cut-off scores are never appropriate; they contribute to underrepresentation of minorities (Wasserman,

2013). The ubiquitous use of cutoff scores does not take into account the standard error of measurement (SEm). The SEm means that a child with a 128 IQ could attain a score of 131 the very next day on the very same test and vice versa.

> The acceptance of some degree of error in the measuring process, taboo to hard-core scientists, may have been Binet's greatest contribution. … It's too bad that many people today do not understand this basic tenet. These people are found in state departments of education, in university admissions offices, in local school districts identifying gifted students, and in countless other corners of the world. They are well-meaning people who routinely apply simple formulas and rigid IQ cut-off points to make complex decisions, key decisions that affect the futures of children and young adults. (Kaufman, 2009, p. 22)

Cutoff scores with no wiggle room for human error discriminate against twice exceptional learners, whose disabilities pull down their IQ scores and whose giftedness masks the degree of their disabilities. Use of the Full Scale IQ for cutoff scores applies a criterion from older versions of the IQ scales that is no longer valid with new versions.

The pernicious problem of IQ test coaching is a direct result of the reliance on objective-sounding numbers to determine placement in programs. An entire industry has cropped up to teach parents how to drill their children in the types of items on IQ tests, in order to increase the children's chances of qualifying for gifted programs (e.g., Quinn, 2010). Coaching robs children of the excitement of experiencing novel tasks, as well as teaching them to be dishonest. The end never justifies the means. IQ scores obtained through coaching are invalid. During individual IQ testing, most coached children reveal that they have been exposed to the items. "I love playing that game at home!"

Gifted children should be selected for programs based on their *need* for services not provided in the regular classroom. Selection should be made by committees of human beings, willing to make subjective decisions—not by a hocus-pocus point system on a matrix. A case study approach is warranted, in which both qualitative and quantitative information is considered. The guise of objectivity that numbers provide does not protect anyone—certainly not the children. Indefensible selection processes threaten to unravel the entire system and eliminate services for the gifted. IQ tests used properly provide evidence of the existence of children who learn in a significantly different manner and need differentiated education.

Comprehensive Assessment of the Gifted

Comprehensive assessment is the administration and interpretation of a complete battery of tests, including individual IQ tests, culminating in a multipage report with background information, test interpretation and recommendations. Some batteries measure creativity and conative factors, such as motivation, drive, persistence, level of frustration tolerance, enthusiasm for learning, and academic passion (Pfeiffer, 2015). Others include instruments that assess self-concept, overexcitabilities, learning style, and personality type. Emotional development may be assessed with projective tests, behavioral rating scales, sentence completions, drawing activities, observations, or interviews. Neuropsychologists have measures to evaluate Attention Deficit Disorder, Social (Pragmatic) Communication Disorder, Autism Spectrum, and other neurological deficits. Diagnosticians use specific tools to investigate dyslexia, dysgraphia, dyscalculia, and disorders of written expression.

At GDC, a self-concept scale has always been administered along with each IQ test. While the IQ tests have changed over the years, the self-concept scale has remained the same. *The Self-Perception Profile for Children* (Harter, 1985) measures scholastic self-concept, social acceptance, athletic self-concept, physical appearance, behavioral conduct, and global self-worth in children between 8 and 12 years of age. There are pictorial versions for younger children, which contain fewer factors, as well as forms for adolescents, with nine factors and an importance scale. This instrument was included in a review of assessment tools for counselors of the gifted,

since a large number of research studies used the measure with gifted children (Feldhusen, Jarwan, & Holt, 1993). In an early study, discrepancies were found between cognitive self-concept and social acceptance that increase with IQ. Highly gifted children had stronger cognitive self-concept scores but lower social acceptance scores than less advanced children (Silverman, Chitwood, & Waters, 1986). To date, self-concept and IQ data have been collected on over 6500 gifted children and the database is available to graduate students.

An integral part of comprehensive assessment is presenting the results to parents. Parents appreciate a thorough discussion of their child's testing so that they completely understand how their child performed and what the testing means. A posttest counseling session provides an opportunity to see the test results, understand their interpretation and determine a plan of action based upon the findings. Nancy Robinson, cofounder of The Halbert and Nancy Robinson Program for Young Scholars at the University of Washington, found that parents had difficulty absorbing all this information at once. At her assessment center, parents were offered a series of follow-up sessions after the assessment to integrate the information and determine future directions. This is an excellent idea, as realizing the full impact of a child's giftedness on the family may take several hours of counseling.

Many of the clients at GDC come from out of state, so all of the information has to be presented at once in the posttest conference. These conferences can be quite lengthy. Although planned for 2 hours, the discussion of complicated "conundrum kids" can extend to 3 hours. The examiner and a senior staff member work as a team to discuss observations, interpret the test results, create recommendations and suggest referral sources. The posttest conference is also a counseling session with the parents to answer all of their questions, especially, "Where do we go from here?" Discussion may focus on long-term goals as well as immediate needs. Many topics can be covered, such as advice on effective advocacy, parenting, schools for the gifted, homeschooling collectives, connecting with other families, scholarship opportunities, ways to further develop particular talents, enrichment opportunities, and information about available resources. A few books might be recommended. Two excellent guides to help parents become effective advocates for their children are *Academic Advocacy for Gifted Children* (Gilman, 2008) and *Re-Forming Gifted Education* (Rogers, 2002).

Designing the report is the most challenging part of the assessment process. The report serves as a blueprint for assisting the child now and in the future. In a good report, the child comes alive. The examiner needs to synthesize an enormous amount of information. The report usually is composed of the following sections: reason for referral, background information, previous test results (if applicable), measures administered, an interpretive discussion of each test given to the child and each rating scale completed by the parents, test behavior, summary, and recommendations. It is time-consuming, but highly valuable, if interpretations are informed by other sections of the report, rather than each test being discussed in isolation. In the recommendations section, it is helpful to suggest ways of developing the child's gifts further, before discussing means of accommodating and ameliorating weaknesses. Reports are often around 15 pages, but they can be considerably longer for complicated cases. Some examiners who specialize in assessing the gifted spend 20 or more hours constructing a report. This endeavor requires dedication.

How is Assessment of the Gifted Different from All Other Groups?

Assessing gifted children is more complex than assessing less capable children. Although there is variability across measures (Kaufman, 2009), a child who is in the average or below average range is likely to score in the same range on different IQ tests. However, at the upper extremes of intelligence, scores on different instruments can vary dramatically. Frequently, children score in the gifted range on one instrument, and not on another. Or they score gifted in one composite

but not on the Full Scale IQ score. Assessment of giftedness is nuanced—as much an art as a science. One size does not fit all. More than a standard battery and rudimentary knowledge of testing is needed.

Which battery of tests will address the presenting questions? Which IQ test is appropriate? Which subtests should be administered? Which composite scores should be derived? How should the test data be interpreted? Do the test scores make sense in light of qualitative evidence about the child? How should the results be presented to (often very knowledgeable) parents? How can the report be designed to be most beneficial throughout the child's educational career? Testing needs to be tailored to the specific needs of the child and address the concerns of the parents.

The Parents

A psychologist in private practice notices that working with parents of gifted children is different from working with other clients. These parents, mostly mothers, tend to be more knowledgeable about assessment and, at the same time, less secure about whether testing their child for giftedness is appropriate. Unlike the experiences of school personnel, private practitioners often deal with tentative parents wondering if they are doing the right thing by assessing their children. Mothers fear that they are overestimating their child's abilities and that they will be deeply embarrassed by the test results. "What if I'm wrong?" After sharing dozens of observations of their child from early on, they ask hesitantly, "Do you think my child needs testing?" They need reassurance. They need to be heard and feel understood. They need to know that they are not alone and that they are usually right (Silverman & Golon, 2008). Augmenting the process with instruments such as the *Gifted Rating Scales* (Pfeiffer & Jarosewich, 2003) or the *Characteristics of Giftedness Scale* (Silverman, 1978) help parents feel that they are on the right path.

Insecurity may also come from disagreement between the parents as to whether the testing is needed or not (Silverman & Miller, 2009). An initial intake process or parent interview can give parents an opportunity to discuss the experiences, fears, questions and conflicts that led to the decision to assess. During this consultation, the practitioner can offer support, dispel myths, ask additional questions, explain the assessment process, and address the parents' concerns. Ideally, all caretakers should participate in this initial consult.

The Children

Gifted children can be a challenge to assess. They are not all pleasers. Some size up the examiner to determine if it is safe to reveal what they know. Some intentionally give wrong answers to test the waters. It may be necessary to stop and explain what the purpose is for testing and why giving correct answers would be wise. Some overcomplicate the questions, because they can't believe they are being asked something so blatantly obvious. The tester may have to ask, "How would a younger child respond to this question?"

Some become completely disengaged if the examiner starts at too low a level. They need to be advised that the test was designed for younger children and for children older than themselves, and that very soon the items will get harder. Some IQ tests, like the *Differential Ability Scales, Second Edition* (DAS-II) (Elliott, 2007), allow the tester to select item sets closer to the child's ability level, where they pass at least three items and fail at least three items. This is reminiscent of the old *Stanford-Binet Intelligence Scale* (Terman & Merrill, 1973), where the ideal starting point was the level at which a child passed some items and failed some items. Vygotsky (1978) called this the zone of proximal development. It is the region of maximum engagement.

Some gifted children come up with really good answers that aren't in the manual. Test constructors have shown interest in hearing about unusual responses of gifted children and often allow credit for plausible answers. It is possible to contact a test author and ask, "Would you give

credit for this?" One test constructor shared that when a child answers harder items after missing an easier one of the same type, she will go back later to the easier item missed and give the child the opportunity to self-correct. The first time the item was presented, the child may not have understood the task. For the same reason, the DAS-II (Elliott, 2007) allows the examiner to teach the child the concept after failure of designated items.

Gifted children, especially twice exceptional children, usually understand what they are expected to do, yet still miss easy items and ace hard ones. Skilled testers of the gifted try to test the limits of a child's abilities, and continue to offer items beyond the discontinue point. Some gifted children get every block design correct, but over the time limit. Children with slow processing speed feel a sense of closure if they are allowed to finish items after the allotted time. Some are adept at reading facial expressions and search for clues in the examiner's expression. Examiners have disclosed that on occasion they have to actually think of something else besides the correct answer because it feels like the child is "reading my mind."

Some take such a long time to respond that the examiner isn't sure whether to move on or not. Bobbie Gilman, Associate Director of GDC, purposely looks away from such a child, pretending to be preoccupied with reading or writing, or says, "Let me know when you have an answer." Some children shut down the minute they miss an item. Some get upset if the tester asks them to say more, probing for additional information. It may be necessary to switch to a task they are comfortable doing, and return to the test later.

The most precious element in individual assessment is ***time***. Gifted children will not try their hardest or reveal the full extent of their abilities if they feel rushed. They will give minimal responses—or even wrong answers—if they sense that the examiner wants the test to be over. They easily figure out that all they have to do is answer incorrectly to end the test. Private evaluators can give gifted children the gift of time. They can offer timed and untimed administration of items. They can administer supplementary subtests to calculate expanded composite scores. They can give children lots of breaks. They can break up the testing into several sessions, if necessary. They can administer the IQ test when the child is freshest. That is usually in the morning, but for some night owls or children recovering from jet lag, it could be later in the day. They have more control over their schedule.

Some gifted children refuse to guess; it's like pulling teeth to get them to share what they know when they are not absolutely certain they will get items correct. Guessing is an important skill for gifted children to learn and the best way to prepare them for tests. During the rapport building time at the beginning of the session, examiners explain that some of the questions are for much older children, and they are not supposed to know all the answers. No points are lost for guessing incorrectly, so it is always a good idea to guess when uncertain. They might play a guessing game with the child, asking something the child could not possibly know. "Guess what I ate for breakfast!" "Now I'll guess what you ate for breakfast." Some testers say enthusiastically, "Good guess!" and give the child a high five. One child tested at GDC said, "I don't know" to nearly every question. So the examiner tested his dinosaur puppet instead, who guessed fearlessly. The dinosaur ended up with an IQ score in the profoundly gifted range (Silverman, 2002). Guessing allows children to take leaps into the unknown—outside their comfort zone.

Some tell the examiner it was the best day of their life and ask if they can come back tomorrow! This is the most magical, satisfying aspect of assessing gifted children. Individual IQ tests present the examinee with novel problem-solving tasks that stretch their minds. Some gifted children have never been challenged to the extent that they are during the assessment. IQ tests are designed to determine just how far a child can reach beyond current mastery. In a good scale, items of graduated difficulty are carefully selected so that a child who passes an easy item feels capable of tackling a slightly harder item. A well-designed instrument is like a well-designed

video game. It offers exactly the right amount of challenge to keep the child in the zone of proximal development. For gifted children, the challenge is often intoxicating. The tester gets caught up in the excitement as well. "Wow! You really did that!" The thought of retirement pales in comparison to the thrill of that moment.

The Instruments

Selection of an IQ test depends on the purpose of the assessment. One test may be preferred to determine if the child meets qualifications for a specific gifted program, while another may be a better choice if the purpose is to document the need for accommodations in a Section 504 Plan. Each scale of intelligence contains required subtests and others that are optional, and each offers various composite scores. Each scale has updated versions based on different theories of intelligence, which means that a child might be identified as gifted on one version but not identified on another version; this is no longer just a function of updated norms.

Wechsler scales are the most popular IQ tests used in assessing the gifted (Pfeiffer, 2015; Sparrow et al., 2005). Their popularity makes them common currency—an accepted language understood in more places. However, the *Stanford-Binet Intelligence Scale* and the *Differential Ability Scale* are also good contenders to consider for different purposes. If the child is highly mathematical, the *Stanford-Binet Intelligence Scale, Fifth Edition* (SB5) (Roid, 2003a) would be a good choice. If the child has strong visual-spatial abilities, the *Differential Ability Scale, Second Edition* (DAS-II) (Elliott, 2007) will illuminate the child's spatial abilities. Children with visual processing speed deficits are likely to perform better on the DAS-II or SB5, where they are not heavily penalized for slow processing speed.

Children with high abstract verbal reasoning abilities used to be the easiest to locate on any IQ test, but the proportion of the current versions that measures abstract reasoning verbally is diminishing, along with our ability to locate these children. This poses a possible mismatch between gifted program characteristics and the learner characteristics of identified students. Abstract verbal learners do well on the *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC-V) (Wechsler, 2014), provided that the examiner administers all of the verbal subtests, including Information and Comprehension, and derives the Verbal (Expanded Crystallized) Index (VECI) (Raiford et al., 2015). The VECI closely resembles the Verbal IQ of earlier versions, is a strong measure of general intelligence, and is often the highest composite score for gifted children (Silverman et al., 2017).

It is recommended that most of the subtests be administered, even if fewer are required to obtain a Full Scale IQ (FSIQ) score. For example, on the WISC-V only seven core subtests are needed for an FSIQ, but 13 subtests enable the examiner to derive the three expanded composite scores that provide better estimates of the child's giftedness. This information is not in the manual. Expanded composite scores (Raiford et al., 2015) are posted on the publisher's website and are not well publicized. These scores are accepted for admission by the Davidson Young Scholar program, PG Retreat, and other opportunities for highly and exceptionally gifted children. If the examiner gives too few subtests, this could prevent an eligible gifted child from qualifying for these programs.

The DAS-II has a higher ceiling (17 years 11 months) than the WISC-V (16 years 11 months). Tests with higher ceilings permit gifted children to demonstrate more advanced abilities. At GDC, we often administer part of the DAS-II, along with the WISC-V, and notice that frequently gifted children score higher on the DAS-II. The SB5 tends to generate much lower scores than the DAS-II or WISC-V for the gifted, which, hopefully, will be corrected in the *Stanford-Binet Intelligence Scale, Sixth Edition* (SB6) (Roid, in prep).

If parents seek testing for their child to gain admission at a specific school or program, it is wise to ask them to find out which tests, and which editions, are on the approved list. Some

programs are unaware of the DAS-II—an unsung jewel in assessing the gifted.

Documenting Untimed Performance

Many of the subtests on Wechsler scales are timed. Timed tests shorten test administration time, which may prove helpful in school settings, where time is limited. However, in settings where there are not as heavy time constraints, time limits are seen as unduly lowering the scores of gifted children who are reflective or who have eye teaming issues. It is frustrating to see a child complete an item accurately a few seconds after the time limit and not receive credit.

Documenting how children perform under timed and untimed conditions can lead to needed accommodations. Children should be allowed to complete items in which they are engaged, and both timed and untimed scores should be reported. The timed performance contributes to the standard score, but the interpretation of the score can include much more information. The examiner can describe how many additional items the child solved correctly after the time limits for which no credit could be given, and estimate what the score would have been without the time constraints.

Extended Norms

Exceptionally gifted children often obtain more raw score points than can be credited. On Wechsler scales, the highest possible scaled score is 19. Betty Meckstroth, an examiner and coauthor of the classic *Guiding the Gifted Child* (Webb, Meckstroth, & Tolan, 1982), created a method of documenting these extra raw score points. In her reports, she would write on the chart of scores, 19 + 2 or 19 + 6, to indicate that the child answered correctly more items than necessary to achieve the highest subtest score. Tracking these extra raw scores paved the way for extended norms to be created for the *Wechsler Intelligence Scale for Children, Fourth Edition* (WISC-IV) (Wechsler, 2003).

WISC-IV extended norms proved tremendously helpful in assessing high levels of giftedness. They allowed all raw score points earned to be counted, where those above certain levels had been previously ignored. Extended norms were posted in *Technical Report #7* (Zhu, Cayton, Weiss, & Gabel, 2008), 5 years after the WISC-IV was released. Based on data from a study of 334 gifted children throughout the USA (Gilman, Robinson, Kearney, Wasserman, & Silverman, 2010), Pearson extended the scaled score range on the WISC-IV from 19 to 28. The highest possible composite score on Wechsler scales has been 160; this was extended to 210. These higher scores have been useful in the diagnosis of twice exceptional children, revealing the severity of the gaps between their strengths and weaknesses. In a study of 104 gifted children, 40 qualified for extended norms (Gilman et al., 2009).

Extended norms are available for both the WISC-IV and the SB5. Extended IQ ranges on the SB5 go as high as 225 (Roid, 2003b). Currently, data are being collected from several sites in the USA to create extended norms for the WISC-V. It is highly recommended that examiners using the WISC-V track the number of raw score points earned beyond the number needed to obtain a score of 19. This will make it possible to recalculate the scores when the extended norms are released.

Insufficient Item Difficulty

Currently, we are trying to measure individuals 6 ft tall with five-foot rulers. Gifted children need tests with high ceilings—more room at the top—for them to demonstrate the full extent to which they are advanced. There are several different ceiling issues in testing this population: insufficient item difficulty, compression of scores at the 99th percentile, no credit allowed for items answered correctly past the limits of the norm sample, and the top score being unduly low. "*Limiting either the scoring range or item diffi-*

culty causes the scores of children of various abilities to compress. The most advanced cannot be distinguished from the others and become invisible" (Gilman et al., 2009, italics in original).

When a gifted child answers items correctly at or near the highest level of a subtest—even if items have been missed along the way—no ceiling is reached. It is necessary for the child to miss a certain number of consecutive items in a subtest for the examiner to feel confident that the child could not have passed more difficult items. This is the discontinue criterion. In one study of the WISC-IV, 95 of 104 gifted children did not reach a discontinue point on at least one subtest (Gilman et al., 2009). For nearly all of the children, the test did not have a sufficient ceiling to be certain that the scores were valid estimates. For 74% of the sample, discontinue criteria were not met on Similarities. The WISC is designed for children from 6 to 16. In the 9–12-year-old range, 30 of the 31 children met no discontinue criteria on one to seven subtests, and 25 of 33 6-year-olds did not reach discontinue criteria on one to five subtests (Gilman et al., 2009).

If 6-year-olds are able to successfully pass items at the top of a scale that goes to 16 years 11 months, clearly there must be insufficient item difficulty. There is no way of knowing if the child would have attained a higher score had there been more difficult items. Therefore, it is recommended that examiners indicate with a plus sign scores where no discontinue criteria were attained. Under the chart of scores, a footnote can be inserted indicating that the plus sign represents a possible underestimate. Composite scores that include that subtest score might also be underestimates. This is the statement used at GDC:

> + Subtests marked with a plus sign indicate that ___ did not reach a discontinue point for administration. These scores, as well as the resulting Indexes and the Full Scale IQ, may be underestimates.

The plus sign acknowledges that the full picture of the child's abilities may not be revealed by the composite scores obtained on this instrument.

In some cases, publishers have responded to this dilemma by adding a few items at the top end that are much more difficult and likely to be missed. These items do not reflect a careful gradation in difficulty. In addition, they have shortened the discontinue criteria, so that a child only has to miss two or three items in a row before the tester stops administering new ones. While these strategies give the appearance that the child has reached discontinue criteria, the problems are actually compounded, yielding underestimates of gifted children's abilities.

Short Discontinue Criteria

When IQ testing was young, glass ceilings were not placed on how much advancement a gifted child could demonstrate. Psychologists who administered the *Stanford-Binet Intelligence Scale* (Terman & Merrill, 1973) used Vocabulary as a routing test to determine the ideal place to begin. After the child was unable to define six consecutive words, the examiner brought out a card with all the remaining vocabulary items and asked the examinee to try defining any additional words beyond the discontinue point. Credit was given for all words correctly defined and for all items passed on other sections of the scale, regardless of how many were missed. This concept makes sense for assessing the gifted, and should be used as a model for designing new, gifted-friendly IQ tests. The gifted often have knowledge well beyond that of their peers. It is unrealistic to expect them to know every consecutive word or item, since the sequence of items in any IQ test is based on the performance of a large, normative sample of children of varying abilities, not necessarily reflective of the gifted.

The trend in modern IQ testing is to shorten discontinue criteria. Discontinue rules were developed to shorten the time for test administration and to prevent frustration for the majority of children tested. Twice exceptional children, who show a pattern of hits and misses, may reach a discontinue criterion and yet be able to pass items

beyond it (Gilman et al., 2009). In a national presentation, Tom Cayton, Clinical Director for Pearson Assessments, indicated that in these cases it was permissible to generate a standard and a nonstandard score. Since discontinue criteria are critical to standardization, scores obtained under standard test conditions must be reported. However, Cayton said that good clinicians also test the limits of the child's abilities. Scores obtained under nonstandard administration are valuable diagnostically (Silverman, Cayton, Kearney, & Wasserman, 2008).

It is recommended that examiners offer items after the discontinue criterion has been met, and report the nonstandard score in the narrative interpretation of the test. One child we tested at GDC responded accurately to six items on Matrix Reasoning on the WISC-V after missing three consecutive items. In such cases, it is helpful to report in the narrative what the child's score would have been if credit had been allowed and to mention that on the WISC-IV the discontinue criterion for Matrix Reasoning was four consecutive misses.

While the trend in test construction is to shorten discontinue criteria, one test author, Cecil Reynolds, went in the opposite direction, which has made a marked difference. We tested two low-income, culturally diverse children on the *Reynolds Intellectual Assessment Scales* (RIAS) (Reynolds & Kamphaus, 2003). Both children missed fairly easy items, quickly meeting the discontinue criterion of two consecutive items. We continued offering items beyond the discontinue criteria to test limits. One child's composite score jumped from 119 to 156, and the other from 118 to 153—from high average to highly gifted (Silverman, 2009b). Both were applying for a program for gifted young children. The director of the school was happy with the choice of these children and went on to accept scores on the test without rigid adherence to the discontinue criteria, because the nonstandard scores predicted success in the program. To the delight of this administrator, Reynolds increased the discontinue criteria on the second edition of the instrument, the RIAS-2 (Reynolds & Kamphaus, 2015).

Interpreting the Scores

Boilerplate interpretations of test scores, following templates taught in graduate school, are not particularly useful for the gifted. Relative strengths and relative weaknesses are disembodied terms. Test scores reveal talents. Children with high scores in Figure Weights and Arithmetic are mathematically talented. The scores also document areas of frustration. Children with Coding scores 3 SD below their highest subtest score hate writing. Test scores speak to those who know how to listen.

Most gifted children have high verbal scores. This is even true for refugee children from Africa whom we have tested. On the WISC-IV, the Verbal Comprehension subtests were the strongest measures of general intelligence (*g*). Perceptual Reasoning was in second place. Working Memory, with the exception of the high *g*-loading of Arithmetic, was third in the lineup. Processing speed was lowest, with Symbol Search ranking close to the Working Memory subtests (Flanagan & Kaufman, 2004). Five data sets of gifted children on the WISC-IV indicated the same rank order of index scores as their *g*-loadings. (See Table 12.2). The data are from studies conducted at Gifted Development Center (Silverman, Gilman, & Falk, 2004), Family Achievement Center (Rimm et al., 2008), National Association for Gifted Children study (Gilman et al., 2010), Wasserman's (2013) study of applicants for gifted educational programs, and the gifted group in the *WISC-IV Technical Manual* (Wechsler, 2003).

Knowing the typical means and ranking of index scores for the gifted provides a basis for interpreting individual profiles that veer from this pattern. (See Table 12.3). The ranking and means for gifted examinees on the WISC-V are quite similar to those of the WISC-IV. The first sample below is reported in the *WISC-V Technical Manual* (Wechsler, 2014). Consistent with the WISC-IV samples, the Verbal Comprehension Index is the highest composite score. Second is the Visual Spatial Index, followed by the Fluid Reasoning Index. The Perceptual Reasoning Index in prior versions split into these two composite

Table 12.2 Performance of five gifted samples on WISC-IV index scores

	GDC	Fam Ach Clinic	NAGC	Wasserman	WISC-IV
	N = 103	*N* = 42	*N* = 334	*N* = 219	*N* = 63
Verbal Comprehension Index	131.7	130.0	133.2	127.3	124.7
Perceptual Reasoning Index	126.4	126.7	127.8	124.0	120.4
Working Memory Index	117.7	119.9	121.6	118.4	112.5
Processing Speed Index	104.3	111.9	112.0	110.4	110.6

Table 12.3 Mean performance of two gifted samples on WISC-V composite scores

	WISC-V Manual	GDC
	N = 95	*N* = 61
Verbal Comprehension Index	127.7	132.8
Visual Spatial Index	121.2	118.2
Fluid Reasoning Index	120.3	119.6
Working Memory Index	117.9	114.0
Processing Speed Index	112.9	107.1

Adapted from Wechsler (2014), p. 115
(unpublished data from GDC)

Table 12.4 Mean performance of gifted and matched controls on WISC-V subtests

	Gifted	Matched control	Difference
Similarities	15.1	10.9	−4.16
Vocabulary	14.9	11.2	−3.77
(Information)	14.6	11.0	−3.53
(Letter-Number Sequencing)	14.3	11.1	−3.20
(Comprehension)	14.1	10.9	−3.19
Digit Span	14.0	11.0	−3.00
(Arithmetic)	13.9	10.6	−3.24
Block Design	13.9	10.9	−3.03
Figure Weights	13.8	10.8	−2.95
(Visual Puzzles)	13.5	11.0	−2.47
Matrix Reasoning	13.3	10.9	−2.38
Symbol Search	12.5	10.2	−2.27
(Picture Concepts)	12.3	10.5	−1.93
(Picture Span)	12.3	10.4	−1.76
(Coding)	12.1	9.9	−2.19
(Cancellation)	11.8	9.7	−2.01

Adapted from Wechsler (2014), p. 115

scores. Working Memory is next, and, Processing Speed is at the bottom, yielding high average mean scores. In Gifted Development Center's sample, the Fluid Reasoning Index was slightly higher than the Visual Spatial Index.

It is also useful in interpreting scores for the gifted to know how other gifted children performed on the subtests. The mean performance of a sample of 95 gifted children was reported in the *WISC-V Technical Manual* (Wechsler, 2014), compared with matched controls. (See Table 12.4).

This chart suggests that gifted children are likely to do best on subtests measuring abstract verbal reasoning. Information and Comprehension are two supplementary tests, which should be administered to calculate the Verbal (Expanded Crystallized) Index. The gifted group performed better on the subtests comprising Working Memory than would be predicted by the rank order of the composite scores in Table 12.3, which used the same data set. The lowest scores for the gifted sample are informative. None of the Processing Speed measures (Symbol Search, Coding, Cancellation), Picture Concepts or Picture Span, add much value in determining giftedness. Cancellation may be useful diagnostically, but it is not recommended as a measure of giftedness. As the *g*-loadings for all the Processing Speed subtests are poor, high intelligence is not an advantage on these clerical tasks.

On the WISC-III and WISC-IV, when a child attained a higher score on the Perceptual Reasoning Index than the Verbal Comprehension Index, the child was likely a visual-spatial learner (Silverman, 2002). But the Visual Spatial Index on the WISC-V bears little relation to visual-spatial interests and abilities. It measures broad visual perception (Gv). The subtests are heavily timed. Visual-spatial learners are more likely to shine on the Fluid Reasoning Index, which is less timed.

Without an interpreter, IQ scores are meaningless. Interpretation is weak if the child's scores are simply compared to the norms for average children.

Scores have deep significance when they are embedded in the context of what is known about the child qualitatively. Do the scores seem plausible given the child's developmental history? Here is a case in point.

We tested a high achieving 16-year-old who wants to go to college early. She was tested a little over a year earlier on the WISC-V with a Full Scale IQ of 128. The psychologist said she "did well" on Similarities (17, 99 %) and she "did well" on Symbol Search (9, 37 %). The report mentioned that the girl had read Dante's *Inferno* at the age of 8; now she is struggling with heavy reading demands and timed tests. The scores did not indicate any learning disabilities. Several months later, another psychologist tested her on the SB5, and obtained an FSIQ of 117, which was reported as "a valid estimate," despite the 128 on the WISC-V 6 months earlier. The Visual Spatial Index was 135, while Working Memory was 109. On a test of visual–motor integration, she scored 61, at the 0.9%; rapid symbolic naming was 70 (2%); Rapid Letter Naming was 2 (<1%). All her other scores were average. The report said that the numbers did not warrant a diagnosis of learning disability. We tested her on the *Wechsler Adult Intelligence Scale, Fourth Edition* (WAIS-IV) and a completely different clinical picture emerged. She attained a Verbal Comprehension Index (VCI) of 145+; Similarities and Vocabulary scored 19+, while Symbol Search was still 9 (difference >3 SD). Symbol Search correlates with reading. Her Reading Rate was at the 25 %, and Blending Nonwords scored at a 2.7 grade equivalent. This highly gifted, highly motivated teen was working overtime to attain stellar grades with a reading disorder masked by her abstract reasoning abilities. The clue that an IQ score of 117 or 128 could not possibly represent the true level of her abilities was that she read Dante's *Inferno* at age 8. She had to be highly gifted! The developmental history provided the context for determining the accuracy of the IQ scores, but the numbers were interpreted without the context. Unfortunately, this is fairly common.

With insufficient item difficulty, short discontinue criteria, no extended norms, low scores yielded by some IQ tests, increased number of timed items, and some items inserted with too steep a gradation of difficulty, there are too many factors that can prevent gifted children from demonstrating their full abilities. It is no longer appropriate for examiners to state in reports for gifted children: "This is a valid estimate of the child's abilities." In more cases than not, the scores for these children are underestimates.

Interpreting Profiles of Twice Exceptional Children

Comprehensive evaluations for learning disabilities are available, but without the gifted lens the full picture is lacking. The focus of these assessments is on pinpointing the weaknesses and recommending interventions and accommodations. Parents may be able to use these reports to obtain accommodations, but they will not qualify a child for gifted provisions and they might lead to rejection at a school for the gifted.

Given the high percentage of children who are 2e, it would be wise for examiners who specialize in testing gifted children to learn how to diagnose these children. To apprehend the interaction between the child's high abilities and disabilities, one first has to be able to grasp giftedness. The gifted specialist can learn the red flags of disabilities. It seems to be more challenging for specialists in other disciplines to recognize giftedness.

Assessment of twice exceptional children is a complicated dance with many steps. Strengths need to be teased out from weaknesses in order to see the child's gifts. Developmental milestones, clinical observations and other qualitative information must be married with test data to gain a clear understanding of the child. Is this ADHD or central auditory processing disorder or sensory processing disorder? Many sources are used to make that determination, including the *Parent/Teacher/Counselor Checklist for Recognizing Twice Exceptional Children* (Gilman & Peters, 2018; Silverman, Gilman, & Maxwell, 2016). This screening tool contains descriptors of general characteristics of 2e learners, visual processing weaknesses, auditory processing

weaknesses, sensory processing weaknesses, ADHD, dyslexia or stealth dyslexia, and autistic spectrum disorder.

Advanced cognitive reasoning ability can be used to solve problems in unique ways so that significant disabilities are hidden. The tester has to examine the pattern of errors on the subtests and the manner in which the child approached the task. A child who has lower than anticipated scores on Comprehension and Digit Span, articulation errors, and asked for many repetitions during the evaluation needs more exploration. Does he mishear his parents at home? Did he speak later than his siblings? Did he have lots of ear infections? Did they start before 6 months of age? If so, he may need further evaluation from an audiologist.

Block Design is a powerful diagnostic test when examiners note the examinee's behavior. Did the child talk her way through the block designs? Did she fail to realize that all the blocks were alike? Did she have difficulty with angles? Did she break the configuration of a square? Did she fail to recognize when she had a block in the right place and move it? Were there signs of visual confusion in other measures? Did she skip lines in Symbol Search? Did she have difficulty in Matrix Reasoning when there was too much visual detail? Did she mix up plus and minus signs in Math Fluency? Did she get a lower than expected score in Passage Comprehension? Does she make "careless errors" in math papers? Was this a child who loved reading and then stopped being interested in books in second grade? (Clue: in second grade the print gets smaller.) These symptoms suggest the need for a vision evaluation.

A typical presentation of a 2e child is one who loves to learn and hates to write. What is his posture like when he is writing? Does he look like a wet noodle? How does he hold the paper when writing? Does he have a strange pencil grip? Does he form letters from the bottom up that others form from the top down? Does he write more slowly than other children his age? Are the letters all scrunched together? Does he start in the middle of the page and work his way around the margins? Does he make letters too big or too small? Does he stick his tongue out when he writes? Does he make reversals in letters and numbers? Has he still not learned to ride a bike? Is he clumsy? Does he lack coordination on the playground? Does he prefer to sit and watch the others play or just walk around the perimeter of the playground telling stories? These are indications of the need for a sensory integration evaluation with an occupational therapist.

Twice exceptional children demonstrate much more erratic IQ scores over time than other groups. Some 2e children have low scores the first time they are tested and they seem to get smarter as they get older. Some have high IQ scores in preschool, and their subsequent IQ scores look like bad news on the stock market. They usually have large discrepancies among composite scores. Flanagan and Kaufman (2004) indicated that when composite scores vary by 23 points (1½ SD), Full Scale IQ scores are uninterpretable. Discrepancies of this magnitude were found in 70% (235) of 334 gifted children whose IQ scores were used to develop a position statement on the use of the WISC-IV (Gilman et al., 2010; NAGC, 2008). Therefore, 23 points may be typical asynchrony for the gifted population. When composite scores vary by 30 points (2 SD), or when the child's highest subtest score is 9 points higher than the lowest subtest score (3 SD), the child is likely twice exceptional (Silverman, 2013). This is well beyond typical asynchrony.

The most elusive 2e children to identify have average ability scores and average achievement scores. It would be difficult to prove either giftedness or disability with their test scores. Classroom performance may also be average. Their developmental milestones are a giveaway, and a casual conversation with them reveals their giftedness. They punctuate their sentences with "Actually,…," ask profound questions and converse like much older children. How can that happen? By the middle grades, a combination of visual, auditory, and sensory processing deficits can flatten the test profile of a very bright child.

It is important for the examiner to look at strengths separately from weaknesses, rather than averaging highly discrepant scores. The highest

composite score is the best indicator of the child's giftedness and the lowest composite score—even if it is in the average range—is a red flag that the child has a learning disability. Instead of asking how a child's scores compare with the norms for average children, a better diagnostic question for twice exceptional children is: "*To what extent does the discrepancy between the child's strengths and weaknesses cause frustration and interfere with the full development of the child's abilities?*" (Gilman et al., 2013; Silverman, 1998).

Twice exceptional children tend to do poorly on group tests, as well as on tests that are timed, require handwriting, or are administered later in the day when they are fatigued. They are easily distracted by noise outside the testing room that no one else notices or flickering lights or an uncomfortable chair. Their motivation is dependent on rapport with the examiner. They often pass harder items and miss the easy ones. This population is clearly at risk with short discontinue criteria (Silverman, 2009b). Family histories should be taken routinely to determine the degree of giftedness in the family and the presence of disabilities. It takes more time and the curiosity of Sherlock Holmes to see beyond the test scores to the actual ability of the 2e child. Each case is unique. Each child stretches the examiner. Assessing twice exceptional children is endlessly fascinating.

Qualitative Evidence of Exceptional Ability

Can you spot a gifted child in a grocery store? What do you notice? Those who have worked with gifted children for many years use informed judgment to identify giftedness. Experienced examiners with this kind of clinical acumen are more likely to trust their own judgment of a child's abilities over test scores that make no sense to them. They estimate the child's intelligence before they assess and they skillfully integrate qualitative information into their picture of the child. The numbers serve as only one source of information in their understanding of this flesh-and-blood human being. Clinical observations, parental reports, family histories, interviews, analysis of qualitative data collected via questionnaires, all provide the context for interpreting quantitative information.

It is possible to determine giftedness through qualitative means, without reliance on test scores. Qualitative assessment employs the assessor as the primary means of data collection. Annemarie Roeper, cofounder of The Roeper School and *Roeper Review*, created a unique method of qualitative assessment to identify gifted children through unstructured interaction. In addition to providing a good estimate of the child's intelligence, confirmed by IQ tests, this nonthreatening method offers a window into the realm of the child's emotions. Annemarie Roeper's method has been used successfully for several years to select students for a school for the gifted. It has promise as an alternative to IQ testing (Wasserman, 2013) and can also be used in conjunction with IQ tests.

> The human psyche is one of enormous complexity, not fully measureable by standardized psychometric examinations. The only instrument complex enough to understand a human being is another human being. AMR Method practitioners use themselves as the instrument through which to understand the child or adult. (Roeper, 2012)

The Annemarie Roeper (AMR) Method of Qualitative Assessment (QA) has three parts: an interview with the parents, an observation/engagement with the child, and a final meeting with the parents to discuss observations and appropriate support. The QA evaluator usually spends around an hour with the child. Creating a totally open and nonjudgmental atmosphere, the evaluator is invited into the child's world. The session is completely driven by the child's agenda and what the child would like to share (Roeper, 2012).

Anne Beneventi spent 18 years training in QA and was appointed Director of the AMR Method of QA shortly before Annemarie Roeper passed. Over time, Anne Beneventi added new elements. She incorporated some of Gifted Development Center's qualitative instruments and she did the assessments in the children's homes.

> I arrive at the child's home without a specific plan. I try to set aside all I have read or heard about the

> child and become completely present and mindful of my own feelings and responses. After quickly introducing myself to the child, I focus my attention on something in the room.… This gives the child time to ease in, with less pressure to interact, and gives an opportunity to evaluate the evaluator. I often have the sensation that I am being closely observed. If children are more introverted, I barely look at them for several minutes, until they approach me or I sense them visibly relaxing. I continue to gauge the child's comfort level. (Beneventi, 2016, p. 253)

As cofounder of a new school for the gifted, Anne Beneventi served as Director of Admissions and used QA as the sole process of selecting young students. Ten years later, it is clear that the method works. The children are succeeding in a rigorous program for the gifted. When older children are admitted based on IQ tests, teachers complain that they do not have enough information about child. The challenge is how to train others to be QA evaluators without an extensive apprenticeship.

From Theory to Practice

Each revision of the major IQ tests we rely on is based on a different theoretical model. All our assumptions, all our legal requirements regarding IQ testing, all our entrance criteria for programs and schools have to be revisited each time a new, improved model is published. For diagnosticians, our clinical acumen has to be rebooted with the new instrument. There can be a steep learning curve. In the USA, it is considered best practice to shift to the new version of an IQ test within 1 year. Clinicians in other countries do not retool and reboot as frequently. It takes several years before adequate translations are available and tested to determine if they are applicable to a specific geographic region. Besides, IQ tests are expensive, and the planned obsolescence (Russell, 2010) we take for granted in the USA is not a universally shared value. It is also disturbing that everyone assumes that a newer IQ test will be better for all populations. Until that proposition is tested with sufficient independent research after the test has been released, no one knows for sure.

Lewis Terman (1916a) defined intelligence as abstract reasoning; he developed the *Stanford-Binet Intelligence Scale* (Terman, 1916b) to measure exactly that. Over 99% of 661 experts on intelligence endorsed "abstract thinking or reasoning" as an important element of intelligence. The second highest ranking, with 97.7% agreement, was "problem solving ability" (Snyderman & Rothman, 1990, p. 56). Similarly, intelligence has been defined as "efficient problem solving, critical thinking, and effective abstract reasoning" (Pfeiffer, 2002; Sparrow et al., 2005, p. 283).

The old Binet was a good measure of abstract reasoning, but it generated a global IQ score. A single number representing a person's intellectual power has rankled untold numbers of critics (e.g., Horn, 1985). Few test constructors believe that a single score can represent a child's abilities (Valler et al., 2017). Despite our enlightened theoretical knowledge that intelligence is multifaceted, IQ tests continue to yield global scores, whether we call them Full Scale IQ scores or General Conceptual Ability or General Intellectual Ability or whatever. Given the number of different factors that go into this stew, these global scores are no longer practically meaningful in determining if a child is gifted.

Test constructors are between a rock and a hard place on this issue. Colin Elliott (2007) offered a General Conceptual Ability (GCA) score for the DAS-II. He emphasized that "Although the GCA may be viewed as a valid measure of *g*, it should be emphasized that it is **not** sufficient to describe a child's abilities with a single number, however valid that number might be" (p. 9, emphasis in original). The GCA is only provided to meet the requirements of local and state regulations. "Some states require a global composite score to qualify a child for special education services, or for placement in a program for the gifted and talented" (Elliott, 2007, p. 9). He was right. State legislation and district policies often do require Full Scale IQ scores for qualification to gifted programs (Rimm, Siegle,

& Davis, 2018). What would happen if IQ tests no longer yielded global scores?

Terman's global IQ bifurcated into Wechsler's Verbal IQ and Performance IQ. Then a four-factor model emerged, which morphed into the current five-factor structure of both the Wechsler and Binet scales. Most current IQ tests are based on Carroll–Horn–Cattell (CHC) theory (Valler et al., 2017). The most prominent IQ test is the WISC-V (Wechsler, 2014). The WISC-V combines CHC theory with other structural models of intelligence (Raiford & Holdnack, 2014). The five index scores measure five broad abilities from Stratum II in CHC theory. The Verbal Comprehension Index (VCI) measures crystallized intelligence (Gc); Visual Spatial Index (VSI) measures broad visual perception (Gv); Fluid Reasoning Index (FRI) measures fluid intelligence (Gf); Working Memory Index (WMI) measures general memory and learning (Gsm); and Processing Speed Index (PSI) measures broad cognitive speediness (Gs). The number of second-level factors has not been exhausted. Carroll (1993) identified eight factors at Stratum II. Guilford (1956) identified 120 intelligences that grew into 150 before he died. This could get more complicated.

As the number of measured factors increases, there is greater potential for disparities among the factors, and as disparities increase, the Full Scale IQ score weakens as a unitary construct (Flanagan & Kaufman, 2004). Gifted children frequently score in the highest ranges on some composite scores, yet fall short of a cutoff score for program placement on the Full Scale IQ. It is difficult to demonstrate unusual ability in five distinct arenas. When access to provisions for the gifted is based upon the FSIQ on a WISC-V, children must be fast, and have excellent visual memory, excellent auditory memory, and excellent eye–hand coordination. This is a tall order. What about children with excellent abstract reasoning who are thoughtful and reflective, or who remember complex ideas but struggle with nonmeaningful memory tasks, or who understand advanced material but have age-appropriate handwriting speed? This is the typical asynchrony of the gifted population (Silverman, 2013). Disparities in test scores are even greater for twice exceptional children, as is the risk of not making the FSIQ cutoff.

Perhaps it is time to lay the Full Scale IQ to rest. It is incongruous with a multifaceted view of intelligence. And it leads to questionable cut-off scores for admission to gifted programs embedded in state legislation and district regulations.

Searching For *g*

How can psychologists of the gifted and gifted program coordinators deal with the increasing number of factors of intelligence, and the inconsistencies of global scores yielded by IQ tests? One possible solution was suggested in "The Measurement of Giftedness" (Silverman, 2009a). "Abstract reasoning and general intelligence (*g*) are synonymous. Giftedness is high abstract reasoning. Therefore (*g*) could as easily stand for *giftedness* as for *general intelligence*" (p. 967, italics in original).

Charles Spearman (1904) defined general intelligence (*g*) as a certain amount of mental energy common to all mental abilities. It is the theoretical underpinning of three popular measures of intelligence (Valler et al., 2017). The "G" in G*c*, G*f* and all the other broad factors in CHC theory is the recognition of general intelligence, which serves as the foundation for all of these specific abilities. "There is abundant evidence for a factor of general intelligence, G (or 3G), found at the highest order" (Carroll, 1993, p. 624).

Understanding the underlying element of *g* in all IQ tests does **not** mean buying a fixed, immutable conception of intelligence. Even Alfred Binet, who codified *g* in the first IQ test for children, did not hold that belief system. Binet viewed intelligence as a myriad of dynamically interrelated abilities, including emotion and personality, which is highly influenced by the environment. A continuously evolving process, it can be improved through appropriate instruction

Table 12.5 *g*-Loadings on the WISC-V

Vocabulary	0.72	Good
(Information)	0.70	Good
(Arithmetic)	0.70	Good
Similarities	0.69	Fair
(Visual Puzzles)	0.69	Fair
Figure Weights	0.68	Fair
Block Design	0.67	Fair
Matrix Reasoning	0.67	Fair
Digit Span	0.65	Fair
(Letter-Number Sequencing)	0.64	Fair
(Comprehension)	0.60	Fair
(Picture Concepts)	0.54	Fair
(Picture Span)	0.53	Fair
(Symbol Search)	0.41	Poor
Coding	0.36	Poor
(Cancellation)	0.21	Poor

Wechsler (2014), p. 84

(Seagoe, 1975). Acknowledging the existence of *g* also does not mean reverting back to a single IQ score to represent intelligence. It simply recognizes that there is shared variance in diverse measures of mental processes (Wasserman, 2013).

The underlying thread in all of the subtests of all the tests is their *g*-loadings. How much general intelligence do they assess? The ones that measure *g* the best give us our best indication of giftedness. Criteria for the strength of *g*-loadings are as follows: 0.70 or above is considered good, 0.50–0.69 is fair, and below 0.50 is poor (Flanagan & Kaufman, 2004). Table 12.5 indicates the *g*-loadings on the WISC-V.

Vocabulary is the only core subtest on the WISC-V with a good *g*-loading. Information and Arithmetic are both secondary subtests that do not contribute to the FSIQ. This means that only one of seven subtests comprising the FSIQ is a strong measure of general intelligence.

A comparison of the *g*-loadings of the WISC-IV and WISC-V is revealing. The previous version of the Wechsler scale had much stronger *g*-loadings (Table 12.6).

The WISC-IV measured general intelligence to a greater degree than the WISC-V. It is interesting that Information and Arithmetic, with their strong *g*-loadings, have been relegated to optional status on both the WISC-IV and WISC-V. In assessing the gifted, Information and Arithmetic provide good estimates of ability, regardless of whether they are needed to derive the FSIQ. Both should be administered to this population.

Table 12.6 Comparison of *g*-Loadings on WISC-IV and WISC-V

	WISC-IV	WISC-V
Vocabulary	0.82	0.72
(Information)	0.79	0.70
Similarities	0.79	0.69
(Arithmetic)	0.74	0.70
(Word Reasoning)	0.70	NA
Comprehension	0.70	0.60
Matrix Reasoning	0.68	0.67
Block Design	0.67	0.67
(Picture Completion)	0.63	NA
Letter-Number Seq.	0.60	0.64
Symbol Search	0.58	0.41
Picture Concepts	0.57	0.54
Digit Span	0.51	0.65
Coding	0.48	0.36
(Cancellation)	0.25	0.21
(Visual Puzzles)	NA	0.69
Figure Weights	NA	0.68
Picture Span	NA	0.54

The *Stanford-Binet Intelligence Scale, Fifth Edition* (Roid, 2003a) offers stronger *g*-loadings than the WISC-V. The sixth edition is currently under construction, but it promises to have similar properties.

> Because SB6 retains a significant number of SB5 items and the same core subtests, I believe that SB6 will show similar *g*-loadings as SB5. Here are the *g*-loadings for the 10 subtests of SB5:
>
> | | Nonverbal | Verbal |
> |---|---|---|
> | Fluid Reasoning | 73 | 78 |
> | Knowledge (crystallized) | 81 | 75 |
> | Quantitative Reasoning | 82 | 84 |
> | Visual/Spatial | 76 | 83 |
> | Working Memory | 74 | 75 |
>
> (*g*-loadings are the average across age groups 6 to 85+)
> (personal communication, G. Roid, Feb. 17, 2017)

The DAS-II (Elliott, 2007) also has better *g*-loadings than the WISC-V, summarized by age groups (p. 162). "Based on analyses of subtest *g* loadings in confirmatory analyses, about half of the DAS-II core subtests are good measures of *g* (0.70 or greater), and the remaining core subtests

are fair measures of *g* (0.51–0.69)" (Wasserman, 2013, p. 320).

Two expanded composite scores on the WISC-V, described in *Technical Report #1* (Raiford et al., 2015), were designed, in part, for "practitioners who use the WISC-V to assess special populations (e.g., children who are intellectually gifted…) or to complete evaluations for specific purposes (e.g., private school admission)" (p. 2). The Verbal (Expanded Crystallized) Index (VECI) is comprised of Vocabulary, Similarities, Information and Comprehension. Three of the four subtests have the highest *g*-loadings. The Expanded Fluid Index (EFI) consists of Matrix Reasoning, Figure Weights, Picture Concepts and Arithmetic. The secondary subtests should be administered to derive these composites.

A new "Gifted Index" has been proposed, which is an expanded version of the General Ability Index (GAI). The five core subtests used to determine the GAI—Vocabulary, Similarities, Block Design, Matrix Reasoning and Figure Weights—are augmented by Information, Comprehension and Arithmetic. The Expanded General Ability Index (EGAI) is a balance of verbal, visual-spatial and mathematical subtests. It includes the VECI, which appears to be a strong indicator of giftedness, along with two visual-spatial and two mathematical measures. Seven of the eight subtests are among the eight highest rankings on *g*-loadings. They also hold high rankings for the gifted group reported in the *WISC-V Technical Manual* (Wechsler, 2014) (See Table 12.4.) Norms have been generated for the EGAI, and research is currently underway at GDC to determine the efficacy of this new composite score. Results were shared at the National Association for Gifted Children conference (Silverman et al., 2017).

Intelligence is multifaceted. Giftedness can be demonstrated in many forms. There needs to be openness to accepting a variety of composite scores, especially those with high *g*-loadings, for determining eligibility for gifted services. The reign of Full Scale IQ scores is no longer psychometrically defensible.

Conclusion

A fundamental purpose of assessment of the gifted is to uncover high abilities that may be hidden by poverty, diversity, disability, prejudice, or lack of opportunity to be displayed. These abilities can then be nurtured. When their advanced abilities are not recognized, gifted children are at risk for serious underachievement, as well as for being misunderstood. Another purpose of comprehensive testing is to discover masked disabilities that could be ameliorated. A third purpose is to discern the degree of developmental advancement, as children may be mildly, moderately, highly, exceptionally, or profoundly gifted. As is true at the other end of the spectrum, these gradations require different accommodations.

When gifted education is legislated as part of special education, as it is in several states, the importance of comprehensive assessment becomes more apparent. Individual intelligence scales are more accurate than group tests and provide a better understanding of a child's strengths and weaknesses. Instead of global scores (e.g., FSIQ), sections with the highest *g*-loadings are recommended for selecting students for gifted programs. But can we rely solely on test scores to make high-stakes decisions regarding gifted students? No. IQ tests are not impartial judges of ability; they frequently underestimate. They require interpretation by knowledgeable practitioners, who rely more on qualitative indicators of giftedness than on scores. Training is needed to prepare examiners to assess giftedness exquisitely.

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13 Recruiting and Retaining Underrepresented Gifted Students

Frank C. Worrell and Dante D. Dixson

Abstract

Students from low-income and ethnic minority backgrounds are frequently underrepresented in gifted and talented education (GATE) programs. In this chapter, we contest the typical definition of underrepresentation in GATE, that is, if a group's percentage of students in a GATE program is substantially lower that that group's percentage in the school population, underrepresentation is present. We argue that underrepresentation cannot be understood without taking into account the pervasive achievement and excellence gaps that exist. Moreover, given that most definitions of gifted and talented involve performance at a high level, we suggest that students performing at the advanced levels on national achievement tests are a plausible group against which underrepresentation can be benchmarked. We conclude the chapter with several recommendations drawn from the empirical literature within and beyond the field of gifted education for both recruiting students from underrepresented groups into GATE programs and retaining them once they are enrolled. We also acknowledge that addressing the issue of underrepresentation is not a short-term endeavor and requires an enduring commitment at all levels of the school system.

From the earliest studies of gifted and talented education (GATE), some demographic groups have been underrepresented in these programs. For example, in Terman's (1922) longitudinal study of "children who had made exceptional good records in a mental test" (p. 312), he described his sample as including (a) an overrepresentation of males, (b) an underrepresentation of students whose parents had Class 4 or 5 jobs (i.e., working class occupations), and (c) a "striking deficiency among Italians, Portuguese, Mexicans and Spanish, all of whom are numerous in the vicinity of Stanford" (p. 314). A little more than a decade later, Witty and Jenkins (1934) began reporting on research on African American children with "exceptional scholastic ability," to counter both the dearth of studies on this group and the general belief that there were no "unusually capable" African American children (p. 585; see also Jenkins, 1936, 1943, 1948, 1950). Despite its long-standing history in gifted education and considerable attention in the extant literature, the issue of underrepresentation

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Table 13.1 Enrollments in districts offering gifted and talented education programs by ethnic group

Ethnic group	Total enrollment (%) in districts with GATE programs	Total enrollment (%) in GATE programs
African American	19	10
American Indian/Alaska Native	1	1
Asian American/ Pacific Islander	5	10
European American	49	62
Hispanic	25	16

Note: Data are for the 2009–2010 year taken from the Office of Civil Rights (2012)

continues to be a major concern in gifted education (Baldwin, 1985; Dynarksi, 2016; Ford, 1995, 1998; Ford, Grantham, & Whiting, 2008b; Ford & Whiting, 2008; Gentry & Fugate, 2012; Worrell, 2003; Worrell, Olszewski-Kubilius, & Subotnik, 2012).

At first glance, the issue of underrepresentation seems to be simple: if the percentage of students in a district or school system is meaningfully higher than the percentage of students in that district's GATE programs, underrepresentation is present; alternatively, if the percentage of students in a district or school system is meaningfully lower than the percentage of students in that district's GATE programs, the group is overrepresented. Table 13.1 contains the total enrollment in districts with GATE programs by ethnic group as well as the percentage of individuals in the GATE programs. As can be seen in the table, these data from the Office of Civil Rights (2012) indicate that African American (−9%) and Hispanic (−9%) students are underrepresented and Asian American/Pacific Islander (+5%) and European American (+13%) students are overrepresented in GATE programs.

However, although easily understood, this comparable percentage definition is misleading, because it is not in keeping with any realistic definition of giftedness actually used in school settings and does not take into consideration the considerable differences in actual performance among demographic groups (Aud, Fox, & KewalRamani, 2010). We would also argue that this definition of underrepresentation also ignores the different beliefs that groups have about equity in the education system (e.g., that the education system will reward hard work, lack of a sense of belonging in gifted programs; Camera, 2016; Ford, Grantham, & Whiting, 2008a; Graham, 2004; Ogbu & Simons, 1998; Taylor & Graham, 2007) that may affect their willingness to participate in gifted programs (Kettler & Hurst, 2017).

In this chapter, we briefly review the statistics on participation in GATE by demographic groups. We then tackle the thorny issue of *why* underrepresentation continues to exist. In our analysis, we address common reasons proposed for underrepresentation that do not provide a complete picture as well as some more fundamental causes of underrepresentation. Next, we provide some recommendations for increasing the number of students from underrepresented groups in GATE programs and retaining them in these programs. But we begin with a review of definitions of giftedness as a necessary prerequisite for understanding underrepresentation. In writing this chapter, we adopt a talent development framework with regard to gifted education (e.g., Dai & Chen, 2014; Subotnik, Olszewski-Kubilius, & Worrell, 2011), as we believe that this framework is more appropriate for addressing underrepresentation than the traditional gifted education framework. Our goal is to provide recommendations that are grounded in the recent empirical literature, as much of the writing in this field is theoretical and speculative.

Defining Giftedness

There are numerous definitions and models of giftedness in the literature (Dai, 2010; Sternberg & Davidson, 1986, 2005; Subotnik et al., 2011), which are translated in a variety of ways into school district identification policies (Callahan, Moon, & Oh, 2014; McClain & Pfeiffer, 2012). However, all of the definitions and instantiations involve performing at a higher level than

same-aged peers in some domain (Pfeiffer, 2012), with schools being particularly focused on academic domains. Early studies in the field used intelligence or *g* as indicative of giftedness, with individuals scoring above a certain cut-score being classified as gifted (e.g., Terman, 1922, 1925), and intellectual ability is still used as an indicator of giftedness in many states (National Association for Gifted Children [NAGC] & The Council of State Directors of Programs for the Gifted [CSDPG], 2015).

The federal government's definition of giftedness also focuses on above average performance, and was reaffirmed in the Every Student Succeeds Act of 2015:

The term "gifted and talented," when used with respect to students, children, or youth, means students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities (p. 398).

Students who are talented in leadership, the visual and performing arts, or athletics are typically not identified for school-based GATE programs (excluding special schools for the performing arts and those with elite athletic programs), as traditional GATE programming centers around achievement in academic domains. Although some school districts use a variety of additional indicators in classifying students as gifted and talented—including creativity, leadership, and motivation (McClain & Pfeiffer, 2012; NAGC & CSDPG, 2015)—it is unlikely that a student who has globally poor academic performance will be classified as gifted or placed in a GATE program.

The talent development model is useful here as this model underscores the importance of potential in early identification:

> Giftedness is the manifestation of performance or production that is clearly at the upper end of the distribution in a talent domain even relative to that of other high-functioning individuals in that domain. Further, giftedness can be viewed as developmental, in that in the beginning stages, potential is the key variable; in later stages, achievement is the measure of giftedness… Psychosocial variables play an essential role in the manifestation of giftedness…[and] both cognitive and psychosocial variables are malleable and need to be deliberately cultivated. (Subotnik et al., 2011, p. 7)

In addition to acknowledging that *potential* is what should be identified in the early stages of identifying giftedness, this definition raises several other issues that have implications for a discussion of underrepresentation. These include that fact that (a) talent is domain specific, (b) psychosocial factors matter, and (c) talent needs to be developed. All of these points are addressed in subsequent sections. It is also important to point out that the Talent Search model, which is arguably the largest GATE program—albeit outside the school system—uses both intellectual ability and domain specific-ability (i.e., verbal, quantitative, spatial) in identifying students (Olszewski-Kubilius, 2004), and this model has proven to be remarkably successful in identifying youth who make outstanding contributions as adults (Lubinski, 2016).

Reasons for Underrepresentation

Despite the apparent national concern about underrepresentation of certain demographic groups in GATE programs (Cosmos, 2016; Dynarksi, 2016), getting an accurate count of students in these programs is not an easy task. Every year, the National Center for Education Statistics (NCES) releases a document entitled "The Condition of Education." A cursory glance at the table of contents of the 2015 and 2016 volumes (Kena et al., 2015, 2016) reveals that although there is a wealth of information in these documents, including data on dropout rates and children living in poverty, there is no information provided on GATE education. The most recent statistics on GATE participation rates are for the 2011–2012 academic year and can be found in the 2015 Digest of Education Statistics (Snyder, de Brey, & Dillow, 2016). These data indicate that 6.4% of students are enrolled in GATE programs.

Although many explanations have been put forward to explain the underrepresentation of minority groups in GATE programs (e.g., low expectations of teachers, biased assessments; Ford & Whiting, 2008), the proximal and most compelling reason for underrepresentation—that is, the achievement gap—is seldom discussed. The achievement gap refers to the fact that, on average, European American and some Asian American students consistently outperform their African American and Latinx counterparts by large margins academically in the K-12 system, resulting in subsequent differences in high school graduation rates and college enrollment rates (Aud et al., 2010; Yeager & Walton, 2011). For example, in 2015, the National Center for Education Statistics (NCES) reported that the percentage of European and Asian Americans students preforming *at or above proficient* in mathematics, based on standardized test scores, was 32% and 46% respectively, in contrast with the 7% and 12% reported for their African American and Hispanic counterparts, respectively (NCES, 2015a). Similar results were reported for reading. The percentages of European and Asian American students performing at or above proficient in reading were 46% and 48%, respectively. For African American and Hispanic students, percentages of students at or above the proficient were 17% and 25%, respectively (NCES, 2015b).

Moreover, these achievement gaps do not only occur in the K-12 system, but are also evident in college enrollment patterns. In a recent article in *The New York Times*, Ashkenas, Park, and Pearce (2017) reported on college enrollment rates across major colleges and universities for African American, Asian American, European American, and Hispanic American students. The data indicate underrepresentation for African American and Hispanic students and overrepresentation for Asian American students at the eight Ivy League schools, eight of the nine University of California campuses, and many of the more selective public and private colleges across the USA.

In Table 13.2, we provide data that takes the achievement gap into account. The percentage of students enrolled in K-12 schools by ethnic group is presented in Column 2 and the percentage of students in GATE programs is presented in Column 3. The last four columns in Table 13.2 provide the percentages of students performing at the highest levels, that is, *advanced*. It is reasonable to assume that students performing at the advanced level are the ones most likely to qualify for GATE programs, and as the data indicate, the percentages of students performing at this level differs starkly by ethnic group by factors as large as 20. This phenomenon, which has been recognized in the GATE literature, has been dubbed the excellence gap (Plucker, Burroughs, & Song, 2010; Plucker, Hardesty, & Burroughs, 2013), and is a manifestation of the achievement gap at the upper end of the achievement distribution (see also Peters & Engerrand, 2016). Using the percentages of students performing at the advanced levels as a benchmark for GATE enrollment instead of the percentage of students enrolled in schools, one could argue that Asian American and European American students are underrepresented, and African American, American Indian/Native Alaskan, and Hispanic students are overrepresented in GATE programs. The fundamental question is, should GATE enrollment be benchmarked against a group's percentage in the school population, or against a group's percentage in the students performing at the advanced level?

Given the underperformance of African American and Latino students on variables that are used *currently* to determine admission into many GATE programs—that is, academic achievement and standardized test scores at the advanced levels—it is inevitable that these groups will be underrepresented in GATE programs. Indeed, in a study of identification in the state of Utah, Warne, Anderson, and Johnson (2013, p. 487) found that "after controlling for academic achievement and SES…all diverse groups of students were more likely to be identified as gifted than White students." Thus, when studying underrepresentation in GATE programs, it is critical to include a consideration of actual achievement levels (Peters & Engerrand, 2016).

The causes of the achievement gap are still debated and include a wide ranging set of factors,

Table 13.2 Percentages of students enrolled in public schools, assigned to gifted and talented education programs, and scoring at the advanced proficiency level in reading and mathematics

Group	PreK-12 students in public schools 2013	Enrollment in GATE programs	Gr 4 students advanced in reading	Gr 8 students advanced in reading	Gr 4 students advanced in mathematics	Gr 8 students advanced in mathematics
African American	16.0[a]	10.0[b]	2.0[c]	<1.0[c]	1.0[d]	1.0[d]
American Indian/Alaska Native	1.0[a]	1.0[b]	4.0[c]	2.0[c]	2.0[d]	3.0[d]
Asian American/ Pacific Islander	5.0[a]	10.0[b]	15.0[c]	5.0[c]	17.0[d]	20.0[d]
European American	50.0[a]	62.0[b]	11.0[c]	4.0[c]	8.0[d]	11.0[d]
Hispanic American	25.0[a]	16.0[b]	3.0[c]	1.0[c]	1.0[d]	2.0[d]
USA	100.0	6.4[e]	8.0[e]	3.0[e]	7.0[e]	8.0[e]

Note: Gr = Grade; N/A = not available
[a]Kena et al. (2016)
[b]Office of Civil Rights (2012)
[c]2007 statistics Aud et al. (2010)
[d]2009 statistics Aud et al. (2010)
[e]2015 statistics Snyder et al. (2016)

such as SES, discrimination, underresourced schools, underprepared teachers, peer pressure, low teacher expectations, low parental involvement, and low expectations for the future, and racism (Barton, 2003; Cohen, Garcia, Apfel, & Master, 2006; Hart & Risley, 2003; Jussim & Harber, 2005; Ogbu & Simons, 1998; Peske & Haycock, 2006; Tenenbaum & Ruck, 2007), among others. There is still little consensus on which of these explanations is the correct one, and more importantly, how much variance is accounted for by the different factors.

Several scholars have also suggested that psychosocial factors are an explanation for the underrepresentation of minority groups in GATE programs. In 2004, Graham argued that with regard to doing well in school, many underrepresented students ask the question of "I can, but do I want to," but not all of them answer in the affirmative to this question. For example, Taylor and Graham (2007) found that African American and Latinx boys and girls in the second and fourth grades chose average or high-achieving same-gender students as admired role models; however, in the seventh grade, while girls made the same choice, African American boys and Latinos were more likely to choose same-gender classmates that were low achievers as role models.

In another study, Ford et al. (2008a) asserted that an academic attitude-achievement paradox (see Mickelson, 1990) explained the responses from their sample of 166 gifted and 206 high achieving African Americans adolescents. Many of these students reported positive work habits and strong study skills on the one hand, but 28% also reported that they did not put forth their best effort in school and 69% reported that they did not study or do homework on weekends. Ford et al. (2008a) also reported that the majority of students were familiar with the phrases "acting White" and "acting Black," and the former was associated with being smart and doing well in school whereas the latter was associated with underachievement and pretending not to be smart. Consistent with cultural ecological theory (see Ogbu & Simons, 1998 for a review), Ford et al. (2008a) contended that the students believing that their hard work would not result in

success like other ethnic groups probably cause these views and work habits. Students who do not put forth their best effort or do not take enough time to master material are less likely to either be identified as gifted or to maintain the gifted label after being identified (Subotnik, 2003).

An additional psychosocial formulation is stereotype threat (Steele, 1997; Steele & Aronson, 1995), which posits that minority students who are aware of the negative academic stereotypes that exist about their group experience heightened anxiety in performance situations that may contribute to decreased academic achievement and disidentification with school altogether. Evidence of differential achievement within gifted samples can be seen in research on samples of students in GATE programs and in patterns of courses taken. Worrell (2007) reported on 319 adolescents attending a summer program for academically talented youth. He found that both European American ($0.61 \leq g \leq 0.63$) and Asian Americans ($1.24 \leq g \leq 1.30$) reported meaningfully higher school grade point averages than African American and Latinx students, although all of the students had qualified for the program. Additionally, using data from 117 high schools from 79 different districts, Kettler and Hurst (2017) reported that African Americans and Latinx students participated in advanced placement and international baccalaureate courses at rates meaningfully lower than their European American student counterparts across two time points a decade apart (average $d = 1.05$ for African Americans and 0.57 for Latinx).

Finally, there are several other psychosocial factors that are related to strong academic performance. These include motivation (Ford et al., 2008a), self-efficacy (Schwery, Hulac, & Schweinle, 2016), aspirations (Southgate, Kelly, & Symonds, 2015), and growth mindset (Aronson, Fried, & Good, 2002), among others. Although many of these factors and models, including cultural ecological theory and stereotype threat, have not been examined specifically in the context of underrepresentation in gifted education and are contested in the literature, their potential association with academic performance indicates that they should be considered. In short, given the complexity of the achievement gap and the substantial number of related variables, it is likely that a host of factors play a role in the differential performance of students ultimately contributing to minority underrepresentation in GATE programs. With this information as a backdrop, we now provide some strategies for increasing and retaining students from underrepresented groups in GATE.

Recruitment Strategies

Both the achievement gap and psychosocial factors have implications for recruitment and these factors suggest different intervention strategies. The achievement gap suggests several strategies including universal screening, the use of multiple indicators, using local norms, and "growing" gifted students would result in more students from underrepresented groups being identified as gifted. On the psychosocial side, making gifted programs more attractive to underrepresented students will also facilitate recruitment. Strategies to accomplish this goal include recruiting students in teams rather than as individuals, making programs more culturally relevant, and expending resources on developing the psychosocial variables that are more likely to result in increased achievement.

Universal Screening

Given the differential performance by groups (Ashkenas et al., 2017; Aud et al., 2010; Erwin & Worrell, 2012; Kettler & Hurst, 2017; NCES, 2015a; Worrell, 2007), the most urgent short-term solution is the implementation of universal screening for gifted programs (Wai & Worrell, 2017). Simply put, universal screening is a process where *all* students are assessed for placement in a GATE program, and is predicated on several assumptions. The first assumption is that traditional assessments can identify students from all backgrounds (Erwin & Worrell, 2012). There is ample evidence that standardized achievement tests are not biased against

subgroups (Neisser et al., 1996; Nisbett et al., 2012) and that mean group differences in achievement are not indicative of bias (see American Educational Research Association [AERA], American Psychological Association [APA], & National Council for Measurement in Education [NCME], 2014).

Second, it is probable that many students from underrepresented backgrounds are not identified because they have not had the opportunity to exhibit their academic talents (Assouline, Ihrig, & Mahatmya, 2017; Ford et al., 2008a). The vast majority of students are never assessed, and identification procedures that are dependent on a nomination stage result in a high number of false negatives (McBee, Peters, & Miller, 2016). Thus, despite the fact that some groups have lower academic achievement and standardized test scores than others, *on average*, it is probable that many students have potential that is unrecognized simply because they have never been formally assessed. This claim is particularly applicable to low-income and minority students, individuals who are less likely to get assessments from psychologists in private practice and also less likely to attend the numerous tuition-based gifted programs that are hosted by universities and other non-school entities (Quinlan, 2016).

This hypothesis is supported by findings in several recent studies (e.g., Card & Giuliano, 2015; McBee et al., 2016). Card and Giuliano (2015) examined whether universally screening students would result in lower rates of underrepresentation among minority students in GATE programs. Their ethnically diverse sample consisted of over 40,000 third grade students from 140 elementary schools over a 4-year period. They found that universally screening all second graders with a nonverbal ability test as a supplement to traditional referral methods resulted in 67% more students being identified as gifted overall (raising the total percentage of identified gifted students within the district to 5.5%), 80% of whom were minority or English language learners.

The biggest challenge to implementing universal screening is funding. For a universal screening program to be implemented, tests have to be purchased, specialized personnel have to hired to proctor assessments, and class time has to be allocated. However, current data indicate that gifted and talented education receives <1% of the federal education dollars (Wai & Worrell, 2016), and even very modest reallocations can provide support for GATE programs, including universal screening. Appropriate education of gifted students is also cost-effective in the long run as their contributions as adults benefit a nation's GDP (Wai & Worrell, 2017) and society more generally (Subotnik et al., 2011). Moreover, as Subotnik et al. (2011) pointed out, it is the education system's duty to provide the opportunity for students to fulfill their potential and develop their gifted abilities. Further, if the failure to implement a universal screening system disproportionally affects minority and disadvantaged groups' identification rates, then implementing a universal screening should be a high priority for gifted programs nationwide. A free and *appropriate* public education should be available for all demographic groups (Subotnik et al., 2011; Wai & Worrell, 2017).

Use Multiple Indicators

Best practices in assessment require the use of multiple data points in decision-making (AERA, APA, & NCME, 2014). For example, colleges use academic achievement, standardized test scores, letters of recommendation, statements of interests, involvement in extracurricular activities, and sometimes even portfolios and interviews in making decisions about admissions. The use of multiple indicators is equally important in gifted identification (Pfeiffer, 2015; Worrell & Erwin, 2011), and identification should not be based on a single indicator (Worrell, 2009). Card and Giuliano's (2015) results were based on the addition of another measure. Importantly, the goal of using multiple measures is to provide *additional* opportunities for finding potential in students.

In a simulation study, McBee, Peters, and Waterman (2014) examined how three different identification models affected the identification

of potentially gifted students: the "and" rule (identification is based on making the cut on *all* identification measure); the "or" rule (identification is based on making the cut on *any* identification measure); and the "mean" rule (identification is based on making the cut on the mean score of the indicators). They concluded that the "and" rule led to many students that could benefit from GATE being excluded whereas the "or" rule was "best suited for 'casting a wide net'" (McBee et al., 2014, p. 82). They concluded that the "mean" rule yielded the most optimal outcomes while minimizing measurement error. Thus, the use of multiple indicators and the appropriate combination of the scores would result in identifying the largest number of gifted students who would benefit from GATE programs.

Use Local Norms *in the Early Grades* and Grow Your Own Gifted Students

More than a decade ago, Lohman (2005a, 2005b) proposed the use of local norms for identifying students. The norms provided with standardized achievement and cognitive tests are based on national samples, and the distributions on which these norms are based often do not reflect the distributions in individual schools or districts. Thus, local norms can allow schools that have lower average performance than the national norms to identify students for GATE programming, if the students show the potential for high achievement in the local context, even if they do not meet the cutoff scores based on the national norms.

We also recommend using local norms, but specifically in the early grades, as the utility of this procedure is to identify students early and provide them with enriched educational opportunities that are likely to result in them being nationally competitive in the later grades. College entrance decisions are based in part on local norms (e.g., GPA in one's home high school) and national norms (e.g., SAT and ACT scores). Doing well in both arenas increases the probability of getting into a more selective college, and as the data provided by Ashkenas et al. (2017) show, excellence gaps are quite prevalent in college admissions. Data from Project Excite (Olszewski-Kubilius & Steenbergen-Hu, 2017; Olszewski-Kubilius, Steenbergen-Hu, Thomson, & Rosen, 2017) highlight the benefits of this approach.

Project Excite invited all African American and Hispanic third graders from their five partner schools to be assessed for possible inclusion (i.e., universal, early identification). They used multiple criteria and a cut score at the 75th percentile (rather than the traditional 90th and 95th percentiles). Identified students received supplemental enrichment programming after school and on weekends from third through eighth grade that was equivalent to an additional half-a-school year, with the amount of hours increasing as students moved up through the grade levels. Evaluations of Project Excite, detailed in Olszewski-Kubilius and Steenbergen-Hu (2017), showed a substantial increase in the number of students who qualified for advanced mathematics classes, an expansion of students' networks of talented minority students (related to the psychosocial factors discussed subsequently), and greater readiness for acceleration. The gap between Project Excite students and their Asian and European American peers was smaller and they outperformed other African American and Hispanic students in their schools by large effect sizes with "performance comparable to White students" (Olszewski-Kubilius & Steenbergen-Hu, 2017, p. 206; see also Olszewski-Kubilius et al., 2017).

One can start growing gifted students even earlier than Grade 3. Data indicate that the percentage of preschoolers enrolled in non-home-based parental care does not differ by ethnicity, with participation generally around 20% (Aud et al., 2010). However, Asian American (55%) and European American (53%) children attend non-Head Start preschools in much greater numbers than their African American (37%), American Indian (29%), and Latinx (31%) peers, respectively, resulting in proportionately more of the former groups getting a *true* head start. Moreover, an intervention study which taught advanced mathematics concepts to kindergartners resulted in substantially more gains for the treatment group than for the control group,

highlighting the benefits of challenging curriculum even in the earliest grades (Casa, Firmender, Gavin, & Carroll, 2017).

Recruit Students in Groups Rather than as Individuals

Identity is particularly salient for minority students (Whiting, 2006), especially in contexts in which they are underrepresented, and ethnic identities and academic identities are not always compatible (Graham & Anderson, 2008; Worrell, 2016), and can have an impact on individuals' sense of belonging. Thus, African Americans and Latinx students and students from low-income households have to make an affirmative decision to participate in a gifted programs where there are few students who look like them, as the numbers of these students is typically small, a problem that not experienced by many Asian Americans as reflected in their representation in GATE programs (e.g., Erwin & Worrell, 2012) and selective colleges (e.g., Ashkenas et al., 2017). Thus, we recommend that underrepresented students be recruited in groups, if possible, rather than as individuals. This model has been used successfully in many programs serving youth underrepresented in college, such as Upward Bound (https://www2.ed.gov/programs/trioupbound/index.html), the Posse Project (https://www.possefoundation.org/), and the Puente Program (http://puente.berkeley.edu/about).

Unfortunately, there is a dearth of studies examining belonging in underrepresented gifted youth, although there are several conceptual pieces that suggest belonging is important (e.g., Worrell, 2010). In one of the few empirical studies that we found using the keywords "gifted," "talented," and "belonging," Miller and Kastberg (1995) found that class was related to a sense of not belonging in the university for six gifted women from working class backgrounds. However, there are studies that speak to a sense of belonging in groups of students who are not classified as gifted. For example, in an experimental study, Walton and Cohen (2007) found that African American and Latino college students' sense of belonging and potential to succeed was undermined by researchers engendering a sense of belonging uncertainty in a context where there were few African American and Latino college students (i.e., computer science). Further, they found that European American students' sense of belonging and potential to succeed was not affected by the same belonging uncertainty manipulation. In a second study in which the intervention countered the sense of belonging uncertainty, the academic achievement of African American students, but not European American students, increased (Walton & Cohen, 2007).

Mirroring Walton and Cohen (2007), Mello, Mallett, Andretta, and Worrell (2012) found that a simple manipulation that made ethnic identity salient resulted in a decrease in school belonging for stigmatized youth (i.e., African American, American Indian, and Latinx) in the intervention group but not for their non-stigmatized peers (i.e., Asian American and European American); neither stigmatized nor non-stigmatized youth in the control group reported decrements in school belonging. Results like these have led several scholars to theorize about the impact of stereotype threat on academic achievement (Cohen & Garcia, 2008) and academic motivational constructs more generally (Thoman, Smith, Brown, Chase, & Lee, 2013).

Make Programs More Culturally Relevant

The belief systems of underrepresented groups also need to be addressed. Minority and disadvantaged groups have endured a multitude of racism, discrimination, and prejudice throughout their history in the American education system, from not being allowed to enroll in America's top schools because of segregation in the 1900s to being placed in the most under resourced schools (e.g., National Equity Atlas, 2014), experiencing microaggressions (e.g., Sue, Capodilupo, & Holder, 2008), and being disproportionately punished for school offences in

current times (e.g., Gregory, Skiba, & Mediratta, 2017). Some scholars have asserted as a result, minority and disadvantaged groups do not trust that the education system will adequately reward their hard work (McWhorter, 2001; Ogbu & Simons, 1998).

One way to combat this skepticism is with culturally relevant pedagogy, which can increase the engagement and motivation of underrepresented students (Howard & Rodriquez-Minkoff, 2017). However, you cannot engage in culturally relevant pedagogy in the classroom with students who are not in your program. We recommend making GATE programs culturally relevant by highlighting how students can engage in enrichment activities that reflect their cultural heritage. This recommendation comes out of the discussion of identity and belonging in the previous passages. Individuals are more likely to join programs in which they can see themselves. For example, the most ethnically diverse division in the American Psychological Association is Division 45, the Society for the Psychological Study of Culture, Ethnicity, and Race.

Retention Strategies

Of course, recruitment of underrepresented students is only one side of solving this problem. Even if programs succeed in identifying more students and getting them to commit to the program, they also need to *retain* these students. Many low-income students and students of color drop out of high schools and colleges before completion (Aud et al., 2010), and selective programs often have higher attrition rates. Thus, it is important to actively work on keeping students enrolled in GATE programs. Also, several of the proposed recruitment strategies (e.g., culturally relevant pedagogy, recruitment in groups, growing your own gifted students) will also facilitate retention. Other retention strategies include providing appropriate teacher training, providing appropriate academic and social-emotional supports, and encouraging and supporting participation in programs outside of school.

Provide Appropriate Teacher Training

Teacher training has been the focus of several scholars who assert that a major reason that minorities are underrepresented in gifted programs is because teachers do not refer them for gifted education (Ford, 1998; Ford et al., 2008b; McBee, 2006, 2010). Despite these claims being supported by some studies (e.g., Elhoweris, Mutua, Alsheikh, & Holloway, 2005), it is not clear what the data will reveal after controlling for student achievement (Warne et al., 2013). From our perspective, appropriate teacher training means more than learning gifted pedagogy for teachers at all levels including preschool teachers (Kettler, Oveross, & Salman, 2017); it also requires learning how to appropriately teach minority students. Culturally relevant pedagogy is one place to start as this approach allows minority students to see themselves in the curriculum and can have an impact on their sense of belonging and motivation, but additional teacher training is not sufficient.

Data indicate that even students in elementary schools are aware of the negative academic stereotypes of African Americans and Latinx and can experience stereotype threat effects under diagnostic testing conditions (McKown & Weinstein, 2003). Additionally, teachers can communicate lower expectations to underrepresented students via differential treatment in the classroom, which results in lower achievement for these groups at the end of the year (McKown & Weinstein, 2008). Thus, teachers need to be trained to communicate high expectations to all students (Rubie-Davies, 2015), especially as research suggests that underrepresented students are more susceptible to teacher expectation effects (Jussim & Harber, 2005; McKown & Weinstein, 2002).

Teachers of students in the early grades also need to remember that their goal is to teach students to *fall in love* with the subject matter (Bloom, 1985; Sosniak, 1985; Subotnik et al., 2011). Passion and interest are driving factors for gifted students and early teachers are the ones who facilitate the development of these factors in students. The literature indicates that many gifted

adults' early memories of the domain in which they are gifted include playful engagement (Bloom, 1985), and this love of the subject is what sustains students as they move from potential to achievement and beyond in a domain (Olszewski-Kubilius, Subotnik, & Worrell, 2015).

Provide Appropriate Academic and Socio-emotional Supports

As noted above, there are excellence gaps that manifest themselves at the highest levels of achievement (Aud et al., 2010; Plucker et al., 2010, 2013; Worrell, 2007). What this means is that when we increase the number of students in GATE programs via strategies like universal screening and use of local norms, there will be mean differences in achievement among ethnic and racial groups *within* the group identified as gifted. It will be important for teachers in these programs to understand the academic strengths and weaknesses of all of the students and provide appropriate scaffolding and supports. In the absence of these, underrepresented students can easily lose their sense of competence and disengage or drop out.

These supports can take a variety of forms. For example, having staff who speak the language of English language learners enrolled in the program provides a powerful message that these students are valued. Similar to recruiting students in groups, it is often helpful to place two or three underrepresented students in the same class if possible, so that a student from an underrepresented group is not the only one of their group in a classroom. Third, one can provide academic support structures (e.g., study labs, drop-in tutoring) for all students so that the idea of seeking help is both normalized and not stigmatized (Worrell, 2011). Staffing these labs with underrepresented college students is also an excellent way of providing role models who are similar, closer in age, and have successfully navigated middle and high school.

There are several specific strategies that can be used. Despite the importance of metacognition in academic success, many students, including those identified as gifted do not engage in metacognition (Young & Worrell, 2018). Thus, metacognition and other active learning strategies can be taught explicitly in GATE programs (Worrell & Young, 2011). Second, teachers should be taught to use wise feedback (Cohen, Steele, & Ross, 1999) with their students. In short, wise feedback is feedback that does two things in addition to providing criticisms about the aspects of an assignment that needs remediation: (a) it invokes high standards and (b) it assures the student that the teacher believes that the student can meet the high standards. Wise feedback has been shown to make students from underrepresented groups more accepting of feedback from European American teachers as well as support the task commitment of these students and their identification with the academic domain. Yeager and Walton (2011) summarized several additional social psychological interventions that can increase achievement outcomes in underrepresented students (see also, Worrell, 2014).

Use Role Models from Underrepresented Groups

Ford (1996) argued that being assigned to a GATE program might result in students from underrepresented groups having to choose between a need for achievement and the need to belong (Graham, 2004). Given that African American and Hispanic students are outnumbered by European and Asian American students in GATE programs (see Table 13.1), this issue is likely to contribute to the decision by underrepresented students to enroll in GATE programs. Support for this claim can be found in a recent qualitative dissertation where 4 of 5 students from underrepresented groups chose not to enroll in AP classes because they did not want to be "a minority within a minority" due to their race (Evans, 2015, p. 217). The one student who did take AP classes was the only student who had been identified as gifted, and he indicated that because he had already been identified as gifted, his African Americans peers had already

ostracized him because of his gifted label (Evans, 2015). Having role models and mentors who are academically successful but are also seen as engaged members of underrepresented communities can counter the notion that members of underrepresented groups are not successful.

Strategies that Benefit Both Recruitment and Retention

Partner with Programs Outside of School

Lack of opportunity is a pervasive and insidious long-term issue within gifted education. Subotnik et al. (2011) asserted that "outstanding performance depends, in large part, on the opportunity to develop the talent that one has" as "opportunity provides a context for talent to be nurtured, sometimes even before it is recognized" (p. 20). The differing rates of opportunity across ethnic and socioeconomic groups are substantial and likely result in differing rates of gifted talent being natured as development of talent often requires additional resources on the part of the family. Olszewski-Kubilius and Thomson (2010) pointed out that the financial demands of developing a child's talent could be extensive (e.g., tutors, specialized teachers, participation in competitions). Many parents of underrepresented students do not have the social and fiscal capital to support their gifted students (e.g., Radford, 2013).

Partnerships between school districts and out of school programs can be useful in addressing both recruitment and retention issues. As reported above, Project Excite set a bar for identification that was considerably lower than the standard threshold and partnered with a district to provide enrichment classes for the identified students over a number of years (Olszewski-Kubilius et al., 2017; Olszewski-Kubilius & Steenbergen-Hu, 2017). The Academic Talent Development Program (ATDP) at UC Berkeley had a similar partnership with a local school district for several years. Using multiple indicators for identification and a cohort model, ATDP identified many underrepresented students who were not classified as gifted in their home district and provided enrichment and acceleration classes over the summer for these students (Gabelko & Sosniak, 2002; Sosniak & Gabelko, 2008; Worrell, 2011). Many of these summer programs offer financial aid to low-income families and school districts can use state and federal funds targeted to low-income families to supplement the summer program funds. These types of partnerships increase the diversity of identified students and provide an integrated talent development pathway involving the school district and the summer program. Further, these types of partnerships mitigate the summer educational divide between children in the homes of the more and less affluent (Sosniak, 2005).

Expend Resources in Proportion to the Quality and Preponderance of Evidence

The final recommendation is aimed at policy makers rather than at school districts and gifted educators. Although the amount of resources that are devoted to gifted education and the excellence gaps is miniscule in the context of the federal education budget (Wai & Worrell, 2017), considerable resources are devoted to trying to eradicate the achievement gap, where the focus is on the lower end of the achievement distribution. For instance, grit and growth mindset have been touted in the popular press (e.g., Duckworth, 2016; Dweck, 2006) and by scholars (e.g., Paunesku et al., 2015; Strayhorn, 2013; Yeager, Paunesku, Walton, & Dweck, 2013) as great ways to increase the achievement of minority groups. By several estimates, millions of dollars have been spent on grit and growth mindset interventions to improve the achievement of minority students (National Science Foundation, 2017a, 2017b).

However, several recent studies indicate that the contribution of these variables to the variance in academic achievement is trivial to small. Dixson, Roberson, and Worrell (2017) examined the role of grit, growth mindset, ethnic identity, and other group orientation for academic achievement in a sample of 105 high achieving African American high school students. They found that GPA was not significantly nor meaningfully

predicted by growth mindset ($r = -0.05$) or the two subscales of grit, consistency of interests ($r = -0.11$) and perseverance of effort ($r = -0.07$). Dixson et al.'s findings on grit mirrored those of Credé, Tynan, and Harms' (2016) meta-analysis of 39 different studies in which they estimated that the "true" correlation between grit and academic achievement is 0.18, a small effect. Similarly, Duval (2015) reported correlations between growth mindset and GPA that were trivial for three of four groups: African Americans ($r = 0.05$), Hispanic Americans ($r = 0.07$), and European Americans ($r = -0.02$); the effect size was small for Asian Americans ($r = 0.22$), who are not the target of the funded interventions.

Given that it is unlikely these interventions will have a huge impact on the students, these resources may be more appropriately used to fund established psychosocial variables which have demonstrably larger effect sizes, such as self-efficacy (e.g., Feldman & Kubota, 2015; Høigaard, Kovac, Øverby, & Haugen, 2015), self-regulated learning (e.g., Obergriesser & Stoeger, 2015), hope (Dixson, Worrell, & Mello, 2017; Gilman, Dooley, & Florell, 2006), time attitudes (e.g., Alansari, Worrell, Rubie-Davies, & Webber, 2013; Andretta, Worrell, & Mello, 2014), and intrinsic motivation (Froiland & Davison, 2016; Froiland & Worrell, 2016), as well as teaching practices that increase motivation (e.g., Froiland, Davison, & Worrell, 2016) and facilitate high expectations in teachers (e.g., Peterson, Rubie-Davies, Osborne, & Sibley, 2016). Indeed, several studies have demonstrated that the predictive validity of motivational constructs is similar across ethnic-racial groups (Froiland et al., 2016; Froiland & Worrell, 2016).

Conclusion

The underrepresentation of certain demographic groups in GATE programs is a long-standing and complex issue, and the most potent explanations—the achievement and excellence gaps—are issues that are still not fully understood. As long as these exist, identification based on academic performance will result in some underrepresentation. However, the recommendations for recruitment and retention provided in this chapter provide some guidance in beginning to address the disproportionalities. It is important to recognize that these strategies require the commitment of school systems and administrators, who need to act affirmatively by putting policies in place (e.g., use of local norms, early identification, acceleration, appropriate teacher training) that are implemented and evaluated. The problem of underrepresentation will not and cannot be solved by individual classroom teachers, although they have a role to play in the retention of these groups in their classrooms. Even under the most ideal conditions (e.g., Project Excite), multiple years are required before meaningful progress can be seen. Nonetheless, we contend that the widespread adoption of these strategies will have a meaningful impact on underrepresentation and set the field on the long path to addressing this long-standing and pernicious issue. In conclusion, GATE programs need to be ready to recruit, receive, and support students from underrepresented groups using empirically supported strategies, and we need to continue to conduct research to examine the effectiveness and utility of the proposed strategies in students identified as gifted and talented.

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14 Perfectionism

Kenneth G. Rice and Zachary B. Taber

Abstract

We review models of perfectionism and evidence supporting conceptualizations of perfectionism as a multidimensional construct best represented by two factors, perfectionistic strivings and perfectionistic concerns. We consider measurement issues relevant to the study of perfectionism in the gifted including the wide range of correlations between perfectionistic strivings and concerns for different measures, the domain specificity of perfectionism, and limitations with cluster analytic methods used in the perfectionism literature with the gifted. Methods for evaluating measurement invariance and latent profile analysis, including factor mixture modeling, are introduced and illustrated through a sample study that examines differences in latent classes of perfectionists in honors and non-honors student samples on perceived stress, depression, college adjustment, and social connectedness. Research on the development of perfectionism is reviewed, with an emphasis on child and environmental factors relevant to the gifted, including questions of academic challenge. Evidence for difficulties in treating perfectionists is presented and intervention studies conducted with clinical and nonclinical perfectionist adults, adolescents, and children are discussed. The so-called "wise" interventions, brief interventions that use theory to precisely and efficiently target specific psychological processes, are advanced as a promising focus of future intervention studies with gifted perfectionists.

Perfectionism has been an important consideration in understanding some of the challenges gifted children may face, and has even been considered a general characteristic of gifted children. For example, the National Society for the Gifted Talented provides a list of "characteristics of gifted students that parents should use to see if they think their child is gifted," and the first item on their list is "Gifted students are often perfectionist [sic] and idealistic." The second item is "Gifted students may experience heightened sensitivity to their own expectations and those of others." The American Psychological Association (2017) addresses perfectionism in Principle 15 (Emotional well-being influences educational performance, learning, and development) as part

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of the "Top 20 Principles from Psychology for preK-12 Creative, Talented, and Gifted Students' Teaching and Learning." The involvement of perfectionism has probably had a more negative valence from the beginning of interest in its connection to the gifted. Doubt has been cast on the appropriateness of this link with some research showing the incidence of maladaptive self-critical perfectionism in gifted people is no higher than it occurs in others. However, there are several reasons to scrutinize those comparisons and other reasons to examine giftedness in light of the multidimensional and multicategorical work that is being done in the area of perfectionism. To those ends, this chapter provides a selective review of research relevant to perfectionism and giftedness with an eye to insights and implications that may inform future work on the intersection of these two constructs.

The diversity of definitions, measures, and implications within each area makes broad generalizations risky at best, which we believe is nothing new to the field of giftedness. We make no pretense of expertise in the gifted area, and no doubt have missed important nuances in the literature, but it does seem important for us to begin with some definitions of giftedness that may seem relevant to the area of perfectionism. According to the Three-Ring definition proposed by Renzulli (1978, 2005; see also Kaufman & Sternberg, 2008), giftedness is the interaction of well-above-average ability, creativity, and task commitment. Well-above-average ability covers both general ability applied across all domains and ability *within a specific domain*. Operationally, well-above-average ability pertains to individuals in the top 15–20% of *any domain*, which is less restrictive than traditional views of giftedness that might require ability in the top 3–5% (i.e., Marland, 1972). Renzulli also proposed two types of giftedness. Those with "schoolhouse" giftedness are good at taking tests or otherwise consuming knowledge whereas those with "creative-productive" giftedness are creative producers of knowledge.

Pfeiffer (2013, 2015) points out that the "high IQ equals gifted" view is one of three main lenses through which giftedness can be understood. According to that view, and somewhat consistent with Renzulli's schoolhouse gifted category, giftedness is based on very high levels of general (*g*) or multidimensional intellectual abilities, understood to mean IQ scores in the top 2–5%. An important caveat is that there is no scientific justification for that cutoff and the related distinction in what should probably be considered a latent class construct of gifted or not gifted. Another part of his tripartite perspective is that giftedness is revealed through "outstanding performance," which is generally understood to mean outstanding academic performance. Such students are often extremely interested in learning and are likely to possess high levels of cognitive abilities. This second form of giftedness is similar to Renzulli's creative-productive gifted category. The third lens involves "potential to excel" and refers to what Pfeiffer calls the "almost or potentially gifted" student (Pfeiffer, 2015, p. 10) who is likely to demonstrate substantial increases in cognitive abilities or academic performance once she or he is provided with additional resources currently lacking or insufficient in the child's life. Such students may not have conspicuously elevated IQ or other standardized test scores but "are often recognized by their teachers and others as bright or quick learners, hardworking, and highly curious about the world around them" (p. 12). Although presented as different lenses to view giftedness, it is also important to note that Pfeiffer is not describing a mutually exclusive taxonomy of giftedness categories that will cleanly separate individuals into neat groups. Instead, these are descriptive and possibly overlapping aspects of giftedness. Indeed, Pfeiffer (2015) strongly asserts that giftedness itself is a social construction and "there can never be a cut score that invariably separates gifted from nongifted students" (p. 41).

We find Renzulli's and Pfeiffer's contributions similar to important points raised in the perfectionism literature about the nature of perfectionism, how best to measure the construct, whether there might different types of perfectionists, and where, if it exists, should be the line that separates perfectionists from others. We agree that perfectionism, like giftedness,

means much more than a single score on a single test and probably needs to take into account multiple dimensions, contexts, and even domain-specificity similar to how some in the giftedness area attend to such complexities. We also have pursued a line of research that suggests to us that perfectionism in certain forms, or represented by certain types of people, could be linked to important outcomes such as creativity, flexible problem-solving, and even longevity, and that other aspects of perfectionism or perfectionists are so personally and interpersonally toxic that substantial impairment in learning, emotional health, and productivity can be expected.

Despite the negative tone ending the preceding paragraph, much of the evidence seems to indicate that gifted/talented individuals are generally in good psychological health and are resilient when challenged, although like any population there are likely to be those who experience significant distress and coping deficits. The risk for problematic perfectionistic characteristics playing a role in those difficulties has been discounted by findings that in gifted samples, perfectionism may be no greater than in nongifted groups. However, much of that research is based on comparisons between groups conducted without first evaluating the adequacy of measures to comparably serve both groups. Moreover, group comparisons might stop when failing to locate differences in average levels of perfectionism between groups (intercept question), or failing to detect disproportionate representation of maladaptively perfectionistic individuals in comparison samples, but often left unaddressed is whether the strengths of effects between perfectionism and relevant outcomes differ for the gifted compared to the nongifted (slope question).

Once measurement equivalence is confirmed, which is in itself a relatively demanding evaluation, there are several different ways by which group comparisons can be undertaken that could have implications for accurately identifying subgroups who may be at risk for perfectionism-related difficulties. We provide an example to highlight some of these issues, and some recommendations aimed at encouraging more contemporary and diversified approaches to measurement and statistical models for cross-sectional differences or longitudinal change we conclude by summarizing some traditional interventions for maladaptive perfectionists and some contemporary approaches that might be efficient and helpful, especially for younger gifted but maladaptively perfectionistic students in educational settings.

Perfectionism

One of the difficulties in parsing perfectionism stems from the various ways researchers define and measure the construct. Perhaps the most universal point of agreement is that perfectionism is at its core a strong, persistent endorsement of extremely high performance standards and expectations. Beyond that relatively straightforward statement, however, is a wide range of models and measures reflecting a diverse set of perspectives about perfectionism. Several of the more popular models will be summarized here but for more thorough coverage, interested readers can refer to other recent texts on perfectionism and its implications (e.g., Sirois & Molnar, 2016; Stoeber, 2017) as well as other papers addressing perfectionism and giftedness (e.g., Fong & Yuen, 2014; Rice & Ray, 2018; Speirs Neumeister, 2018).

Earlier and even some recent conceptualizations present perfectionism as a unidimensional personality characteristic reflecting "a kind of pathology" (Pacht, 1984, p. 387). Shafran, Cooper, and Fairburn (2002) defined "clinical perfectionism" as the "overdependence of self-evaluation on the determined pursuit of personally demanding, self-imposed, standards in at least one highly salient domain, despite adverse consequences" (p. 778). It is relatively easy to accept that perfectionism can indeed be problematic, and might even be considered transdiagnostic given its strong presence within common psychological disorders (Egan, Wade, & Shafran, 2011), though the evidence supporting the presence of perfectionistic characteristics among people with a wide range of psychological prob-

lems has not yet led to perfectionism being formally designated a disorder in itself. Plus, there are different views on what perfectionism is or how it should be defined and measured, with some arguing that not all features of perfectionism are maladaptive.

Frost, Marten, Lahart, and Rosenblate (1990) developed a model and measure of perfectionism containing six dimensions: Concern over Mistakes, a negative interpretation of failure and equating of even trivial mistakes with failure, Personal Standards, setting excessively high performance standards and expectations, Parental Expectations, the perception of parental standards and evaluation, Parental Criticism, the perception of parental criticism, Doubts about Actions, a vague sense of doubt or uncertainty about the quality of one's performance, and Organization, the affinity for order and organization. A second popular model and measure of perfectionism was developed by Hewitt and Flett (1991) who incorporated cognitive, motivational, and interpersonal aspects of perfectionism. Their model separates perfectionism into three dimensions. Self-oriented perfectionism refers to strong, self-imposed demands for perfection. Other-oriented perfectionism refers to holding others accountable to excessive standards of behavior. Socially prescribed perfectionism denotes perceived pressure from others to live up to their extraordinary expectations and unforgiving evaluations.

A third popular model of perfectionism was advanced by Slaney and colleagues (Slaney, Rice, & Ashby, 2002; Slaney, Rice, Mobley, Trippi, & Ashby, 2001). After several qualitative and quantitative studies (e.g., Slaney & Ashby, 1996; Slaney, Chadha, Mobley, & Kennedy, 2000), they settled on three primary perfectionism dimensions: Standards, Order, and Discrepancy. High performance standards and preferences for order and organization were similar in some respects to dimensions identified by Frost and Hewitt and Flett, but the discrepancy dimension was different. Discrepancy was defined as the perceived gap between one's expected level of performance and the degree to which that expectation was being met. What quickly emerged and has held up over time (e.g., Rice, Gnilka, Davis, & Ashby, 2017) is that this Discrepancy dimension is a psychometrically strong, core element of problematic perfectionism whereas the valence attached to Standards and perhaps to a lesser extent Order, was generally but not necessarily positive. The three-factor model is operationalized in the Almost Perfect Scale-Revised (APS-R; Slaney et al., 2001) and a reduced, two-factor model of Standards and Discrepancy has more recently been operationalized with the short Almost Perfect Scale (SAPS; Rice, Richardson, & Tueller, 2014).

Excluding short versions of previously published scales, we recently counted 19 measures of perfectionism presented in peer-reviewed journals (Rice, Richardson, & Ray, 2016). Given the review thus far, and the proliferation of perfectionism scales, what are researchers in the gifted field to make of the various proposed dimensions of perfectionism and accompanying measures? Sondergeld, Schultz, and Glover (2007) raised a seemingly related point after reviewing only three perfectionism scales: "perfectionism historically has been theoretically diffuse, and remains an empirically and socially derived moving target in the literature" (p. 20).

Despite its multidimensional nature, and what may seem to be a difficult construct to measure or understand, chances are good that results based on any two or more scales from different conceptual allegiances can be reduced to two second-order factors that parsimoniously account for interrelations among a variety of first-order factors. For example, Frost, Heimberg, Holt, Mattia, and Neubauer (1993) labeled the two broad factors "positive achievement strivings" (subsuming personal standards, organization, and self-oriented perfectionism) and "maladaptive evaluation concerns" (subsuming concern over mistakes, doubts about actions, and socially prescribed perfectionism). The positive strivings factor was associated with higher levels of positive affect and maladaptive evaluation concerns was correlated with higher levels of negative affect and depression, providing support for a more nuanced view of perfectionism that included both positive and negative charac-

teristics (similar findings were reported by Slaney, Ashby, & Trippi, 1995, and Rice, Ashby, & Slaney, 1998). Frost et al. (1993) noted that the idea of positive and negative dimensions of perfectionism was consistent with Hamachek's (1978) earlier descriptive account of normal and neurotic perfectionists. The findings could also be viewed as consistent with Adler's (1956) perspective that striving for perfection can be considered a normal, innate aspect of human development.

More contemporary labels for the two dominant factors were advanced by Stoeber and Otto (2006) who described *perfectionistic strivings* or high personal performance standards and *perfectionistic concerns* such as worry about making mistakes and perceived inadequacy in meeting standards. Perfectionistic concerns are regularly linked to personal and interpersonal problems, such as depression and poor social relationships. Correlates of perfectionistic strivings (e.g., personal expectations for attaining high performance standards) are at best inconsistently associated with pathological outcomes and often associated with positive outcomes.

Although two factors may succinctly reflect the main dimensions of perfectionism, it should be noted that measurement selections determine how strongly those two dimensions are correlated. There is, in fact, an extremely wide range of correlations between the two dimensions, from *r*s = 0.00–0.70 (Stoeber & Otto, 2006). At the low end of the correlations are nearly orthogonal perfectionistic strivings and concerns subscales or factors, such as from the APS-R or SAPS (Rice et al., 2014; Slaney et al., 2001). The upper-end of correlations emerge from models and measures with more overlap and less distinguishable dimensions, such as from the Frost et al. or Hewitt and Flett MPS. The implication is that, for some measures, strivings appear strongly linked to concerns, which would reasonably be interpreted to mean both dimensions likely represent a problematic set of characteristics. As Stoeber and Otto (2006) initially demonstrated (see Stoeber & Gaudreau, 2017, for a recent update), a clearer understanding of patterns of association between strivings, concerns, and outcomes, emerges after controlling for the respective effects of the other perfectionism dimension.

Less correlated or orthogonal perfectionism factors suggest potentially independent aspects of the construct, with strivings not necessarily implicated in problematic perfectionistic concerns, and vice versa. This distinction is probably most important for models of perfectionism that emphasize standards or standard-setting as central to perfectionism (Lo & Abbott, 2013; Stoeber & Otto, 2006), but also helps clarify why it is that many individuals are reluctant to relinquish their high standards or expectations (Stoeber & Hotham, 2013; see also Egan, Dick, & Allen, 2012). Echoing Adler, the strivings themselves may not necessarily be problematic. As an example, although Silverman and Golon (2008) listed perfectionism among the "typical traits of giftedness" (p. 201), they acknowledged that perfectionism is "one of the most frequently misunderstood qualities of the gifted" (p. 213). They elegantly explained that perfectionistic strivings could be a risk factor for "paralysis and underachievement" or a source of positive, motivational energy, "the passion that leads to extraordinary creative achievement—an ecstatic struggle to move beyond the previous limits of one's capabilities" (pp. 213–214). Borders, Woodley, and Moore (2014) identified "high expectations of self and others" under strengths of gifted students but placed "intolerant, perfectionistic; may become depressed" (p. 131) under associated behaviors. Borders et al. added that sensitivity was both a strength and potential problem for the gifted that could lead taking criticism more personally than warranted. Thus, key considerations are whether perfectionistic strivings to achieve high performance standards are reasonable and motivating *or* unreasonable and debilitating. Allowing for these factors to reside in varying degrees within individuals has been one reason for the typology or classification approach, or variations from the additive or block entry prediction models, such as Gaudreau and Thompson's (2010; Gaudreau, 2017) 2 (high/low standards) × 2 (high/low concerns) model.

Implications

There are several examples in the perfectionism and gifted literature that support different adjustment and performance implications for various combinations of strivings and concerns. For example, in a study of gifted 6th–12th graders, Wang, Fu, and Rice (2012) reported that perfectionistic strivings were positively associated with academic efficacy, GPA, and life satisfaction, and perfectionistic concerns were inversely linked with those outcomes. Shaunessy, Suldo, and Friedrich (2011) compared general education high school students with those in an International Baccalaureate (IB) program at the school. For both groups, self-critical perfectionism (concerns) was linked to greater anxiety, lower life satisfaction, and lower grade point averages (GPAs). Standards (strivings) was unrelated to anxiety and positively associated with life satisfaction and GPA. Group comparisons revealed a stronger positive association between strivings and life satisfaction for the general education students, and a stronger negative association between concerns and life satisfaction for the IB students.

Studies of advanced high school students (Speirs Neumeister & Finch, 2006), gifted adolescents (Wang et al., 2012), and elite athletes (Gucciardi, Mahoney, Jalleh, Donovan, & Parkes, 2012; Ommundsen, Roberts, Lemyre, & Miller, 2005) using different perfectionism measures have reported somewhat similar effects regarding achievement goal orientations. Findings indicated that perfectionistic strivings were positively associated with mastery approach goal orientations (need for achievement, strive for competence) and performance approach goals (demonstrate competence relative to others). Perfectionistic concerns were positively associated with *both* performance approach and avoidance (avoid appearing incompetent) goal orientations. For athletes, Gucciardi et al. (2012) also found mastery avoidance goals were associated with perfectionistic concerns whereas Ommundsen et al. (2005) found stronger associations between both perfectionism dimensions and performance orientations (ego goals) than mastery orientations (task goals).

Cultural Considerations

There are several additional issues that may have a bearing on the assessment and implications of perfectionism among the gifted. For many North American samples, high levels of perfectionistic strivings plus high levels of perfectionistic concerns is a potentially problematic combination likely to limit motivation and performance whereas high strivings combined with low levels of concerns seem more likely to be an adaptive combination for motivation and performance. Whether such combinations produce adaptive and maladaptive outcomes in other regions of the world (e.g., Arana, Rice, & Ashby, 2017; Smith, Saklofske, Yan, & Sherry, 2016; Wang, Permyakova, & Sheveleva, 2016), and even within subgroups in North America, is an increasingly popular question to address.

As pointed out generally by Chen (2008) and more specifically by Fong and Yuen (2014) and Zane and Song (2007), a characteristic such as tendency to be self-critical in response to perceived performance inadequacies may be problematic in one culture but in another may be positive or adaptive in that such a tendency aligns with established cultural norms. Zane and Song (2007, p. 295) explained that, "Research in Japan and other East Asian societies indicates that…the basic underlying motivation is to be self-critical and to make continual efforts to improve oneself and to reduce one's shortcomings" (see also Chang & Chang, 2009; Lo, Helwig, Chen, Ohashi, & Cheng, 2011). Thus, experiencing failures as prompts to increase effort and persistence (e.g., the "Chinese view of perfectionism;" Fong & Yuen, 2014), and adopting a self-critical approach regarding limitations or mistakes, might be consistent with recommendations for positive self-growth within a culture (Chang & Chang, 2009; Lo et al., 2011; Zane & Song, 2007).

For example, in a study of gifted and non-gifted Chinese children (M_{age} = 10), Chan (2010) found that those with high strivings plus concerns (labeled "unhealthy") were comparable to those with high strivings plus low concerns (labeled "healthy") on several dimensions of intelligence

(e.g., verbal-linguistic, logical-mathematical). Although, the "healthy" group had higher levels of intrapersonal intelligence (adaptive coping) and interpersonal intelligence (ability to understand and effectively interact with others), the "unhealthy" group was higher than nonperfectionistic children on those dimensions as well. Relatedly, although many studies support the problematic implication of perfectionistic concerns, such as between self-criticism and depression, those associations may be weaker in some groups compared with others (Rice, Richardson, & Clark, 2012). In short, there may be different implications for various levels or combinations of strivings and concerns that might further vary as a function of cultural context for those being evaluated. The potential value of perfectionism and the possibility that effects of perfectionism could vary by subgroup seem particularly relevant to highly talented and gifted individuals.

Psychometric Considerations

A related issue that should be standard practice when evaluating group mean differences or group differences in associations between predictors (perfectionistic strivings and concerns) and criterion variables (e.g., academic performance, depression) is whether scales used to make such comparisons are measurement invariant between the groups. Evaluating psychometric comparability may be an obvious necessity when conducting cross-cultural comparisons (Chen, 2008), but less obvious yet still relevant is to conduct such tests when comparing any groups, such as when comparisons are made between gifted and nongifted samples. Indeed, without such evaluations of measurement invariance, differences or the lack of differences may reflect the actual state of affairs or may simply reflect measurement limitations. Measurement invariance analyses seem infrequently conducted in such studies. Chan (2010) provides an exception, however that study evaluated metric invariance (factor loadings) and covariance structure, but not scalar invariance (intercepts) required for tests of factor mean differences between groups.

As is probably clear from the preceding paragraphs, conceptualization and measurement pose intertwined challenges in the area of perfectionism that would carry over in studies of perfectionism and giftedness. In the following section, we further examine through an applied example some specific measurement and related classification issues. As others have recently observed (e.g., Mammadov, Ward, Cross, & Cross, 2016), we consider how modern approaches to classification and specifically classifying perfectionists might hold similar promise in differentiating gifted and talented individuals for whom, to borrow from Chang (2003), perfectionism is a virtue from those who experience perfectionism as a vice.

Measurement Invariance

Group comparisons between gifted and nongifted samples are a persistent area of interest. As indicated earlier, perfectionism-relevant research questions in this thread could include whether level or average differences exist in perfectionistic characteristics between gifted and nongifted groups (intercept question), whether levels of perfectionism change over time, and whether one group might experience more perfectionism-related consequences than the other, such as whether the association between perfectionistic strivings or concerns and self-esteem is stronger for the gifted than it is for the nongifted (slope question). Another general way of thinking about the slope question is whether gifted status moderates the effects of perfectionism on personal, interpersonal, or performance outcomes (see Closson & Boutilier, 2017, for a recent example). Answering either the intercept or slope question requires preliminary attention on the psychometric properties of measures used in the comparisons, and specifically whether non-invariance with measures can be ruled-out as a rival hypothesis for any detected differences. In this section, we summarize key procedures in evaluating measurement invariance and apply

those procedures to a comparison involving honors and non-honors college students.

Several resources provide good introductions to measurement invariance (e.g., see Knight & Zerr, 2010, and related papers in a special section of *Child Development Perspectives*). Measurement invariance analyses yield rigorous tests of item robustness of measurement scales, and can provide added precision when assessing group differences and longitudinal change. Invariance testing ordinarily begins with the evaluation of a baseline measurement (factor) model for a scale in which item loadings on one or more factors loadings and item intercepts are permitted to freely vary between groups (or over time). As an example, the Short Almost Perfect Scale (Rice et al., 2014) contains four items measuring Standards (strivings) and four items measuring Discrepancy (perfectionistic concerns). The initial starting point in a measurement invariance analysis would be to test a measurement model, ordinarily evaluated with confirmatory factor analysis (CFA), in which the four Standards items are set as indicators of the Standards factor, and the other four items are constrained as indicators of the Discrepancy factor. If groups will be compared, this measurement model is initially tested within each group separately (separate CFAs), and then in a multiple groups CFA, again with item loadings and intercepts permitted to be freely estimated between the groups. This multiple groups CFA is typically referred to as "configural" or pattern invariance, though technically there is not a formal test of invariance at this step.

"Metric" invariance involves a formal invariance test in which the configural invariance model is tested against a model in which factor loadings or associations between item indicators and their respective latent factor(s) are now constrained to be same between groups or over time. If model comparison statistics support metric invariance, then the unit of measurement is equal for the groups, allowing for the strengths of associations between the factors and criterion variables to be compared between the groups.

"Scalar" invariance is supported when item intercepts (or thresholds in the case of categorical indicators) are not substantially different between groups (or across time). More formally, scalar invariance evaluates whether the items possess the same point of origin for the different groups (or over time). The statistical test of scalar invariance involves a comparison between the metric invariance model (constrained loadings but freely estimated intercepts) with the scalar invariance model (constrained loadings and constrained intercepts). If scalar invariance is supported, factor means between groups (or over time) can be reliably tested. Mean differences between factors are then likely the result of true factor-level differences rather than systematic tendencies for one or the other group to endorse item responses in a particular direction (Brown, 2015).

Other forms of measurement invariance are possible to evaluate, but in general, demonstrating metric and scalar invariance is deemed sufficient for most applications (Brown, 2015; Little, 2013). Of course, measurement models and related analyses can be considerably more complex. Readers interested in additional forms of both measurement and structural invariance (e.g., invariance of factor covariances), as well as some examples of statistical procedures to evaluate invariance, such as exploratory structural equation modeling, bifactor models, and multilevel measurement invariance analyses, might refer to Marsh et al. (2009), Morin, Arens, Tran, and Caci (2016) and Kim et al. (2016).

Measurement Invariance Example

We analyzed data from a sample of honors ($N = 290$) and non-honors ($N = 368$) students at a major public university ($M_{age} = 20$). Both groups participated through a web-based survey. Measures included the short version of the APS-R identified by Rice et al. (2014), with four items as indicators of Standards (strivings) and four measuring Discrepancy (perfectionistic concerns), and the four-item short version of the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983).

The three-factor measurement model (Standards, Discrepancy, and Perceived Stress)

fit the data relatively well for both the honors and non-honors students, comparative fit index (CFI) = 0.945 and 0.982, respectively. Standardized factor loadings ranged from 0.70 to 0.89 for Standards and Discrepancy, and from 0.54 to 0.75 for Perceived Stress.

The formal tests of invariance began with the freely estimated parameters between the two groups (configural invariance), which produced reasonably good fit, CFI = 0.962, RMSEA = 0.057 (0.046, 0.068). Imposing the constraint of factor loading equivalence (metric invariance) did not substantially worsen fit, difference in scaling-corrected χ^2 (9, N = 658) = 6.02, p = 0.738, ΔCFI = 0.003. The test of scalar invariance produced mixed results, with $\Delta\chi^2$ (9, N = 658) = 23.92, p = 0.004, meaning that imposing intercept equivalence significantly worsened fit, but ΔCFI = 0.960 (metric) − 0.965 (scalar) = −0.005, suggesting (a) both CFI values were relatively high and there was no substantial or practical difference after imposing the constraint on intercepts. Because sample size can affect chi-square results, such discrepancies in findings are not unlikely, and our initial inclination is to simply retain the scalar invariance model as acceptable. Nevertheless, it is useful to explore item ratings for practically meaningful differences in intercepts between groups.

Examination of freely estimated intercepts revealed one Discrepancy item with a larger difference between groups than the other items ("Doing my best never seems to be enough."). Allowing the intercept for that item to be freely estimated for both groups, while constraining the remaining 11 intercepts, provided support for a partial scalar invariance model, $\Delta\chi^2$ (8, N = 658) = 9.39, p = 0.311, ΔCFI = −0.001.

Structural Invariance

Factor mean differences between honors and non-honors for Standards and Discrepancy were not statistically significant, p = 0.381 and 0.614, respectively. There was a trend effect of honors students with lower levels of Perceived Stress compared with the non-honors students, p = 0.055. There were no differences between groups in factors correlations, p = 0.562. Standards and Discrepancy were not significantly correlated (ϕ = −0.08, p = 0.077), there was a modest inverse association between Standards and Stress (ϕ = −0.16, p = 0.003), and a strong association between Discrepancy and Stress (ϕ = 0.60, p < 0.001).

Slope Question

The "slope" question is whether strengths of association vary by (are moderated by) honors/non-honors status. A related extension, based on the 2 × 2 model (Gaudreau & Thompson, 2010), and one that will subsequently segue us into latent profile analysis, is that Standards and Discrepancy might interact to predict Perceived Stress, and that interaction effect might vary as a function of student status. Such tests are possible with latent variables (see Marsh & Hau, 2007; Marsh, Wen, & Hau, 2004). The Standards × Discrepancy interaction term was created using the quasi-maximum likelihood approach (LMS/QML) approach (Klein & Moosbrugger, 2000; Klein & Muthén, 2007). Model comparisons revealed that the strengths of association between perfectionism (including the interaction) and stress were comparable for non-honors and honors students, $\Delta\chi^2$ (3, N = 658) = 3.06, p = 0.383. Across groups, the estimated path from Standards to Stress was significant, γ = −0.095 (SE = 0.046), p = 0.039, as was the path from Discrepancy to Stress, γ = 0.26 (SE = 0.028), p < 0.001. The Standards × Discrepancy interaction was not significant, γ = 0.028 (SE = 0.044), p = 0.529.

Classification Analyses

A reasonable extension of the Standards × Discrepancy interaction is to ask whether there are natural subgroups of students with various levels of those two central factors. The related question is whether there are adjustment or performance implications for any identi-

fied subgroups. Approaches such as cluster analysis, latent class and latent profile analysis, and factor mixture modeling provide methods for answering such a question. In this section, we briefly mention a few of the studies that have used classification analyses with gifted samples and provide an example using the sample of honors and non-honors students.

Parker (1997) used cluster analysis of Frost et al. (1990) Multidimensional Perfectionism Scale data based on a large sample of over 800 academically talented sixth graders. Results revealed three clusters that Parker labeled as "healthy," "dysfunctional," and "nonperfectionistic" students. The healthy perfectionists had a "moderately high level of personal standards, which is probably indicative of focused and realistic standards…whose perfectionistic strivings motivate them to successfully achieve" (p. 555). The group of healthy perfectionists, compared with the other clusters, had the lowest levels of scores on indicators of neuroticism and had the highest levels of extraversion and conscientiousness. Parker's "dysfunctional" perfectionists scored the highest on all perfectionism indicators with the exception of preferences for organization. That group had the highest level of neuroticism compared with the other clusters, and the second highest level conscientiousness after the healthy perfectionists. Similar outcomes in terms of three clusters, but with somewhat different labels for the clusters, have been reported in a series of studies by Chan (2009, 2010, 2012) using the Frost et al. MPS and the Slaney et al. APS-R.

Revealing some limitations with cluster analysis, the most classification errors in Parker's (1997) study occurred with the dysfunctional perfectionists; such errors can suggest a less clear separation of the cluster or greater within-cluster variation, and those issues might have played a role in variations in cluster analytic findings involving giftedness and perfectionism (e.g., Portešová & Urbánek, 2013). Dixon, Lapsley, and Hanchon (2004) identified four clusters among students attending an academy for science, mathematics, and humanities: "non-perfectionists," "mixed-adaptive" (healthy or functional), "mixed-maladaptive" (unhealthy or dysfunctional), and "pervasive." Their "mixed-adaptive" cluster (with high strivings and moderate concerns) had the highest levels of academic competence compared with the other clusters. Students in clusters with high strivings and high concerns were the most depressed, compulsive, and interpersonally sensitive compared to other students.

Some level of inconsistency in cluster analytic studies is not unique (e.g., Boone, Claes, & Luyten, 2014; Rice, Ashby, & Gilman, 2011; Sironic & Reeve, 2012; Wang, 2012), or even unexpected. Ruscio, Haslam, and Ruscio (2006) pointed to limitations in stopping rules for identifying clusters as "highly fallible, and cluster analyses often over-identify clusters" (p. 48). Mammadov et al. (2016) indicated that the "biggest flaw of cluster analysis is its inherently unfalsifiable and atheoretical feature" (p. 178). They advocated the use of latent profile analysis (LPA) as a more methodologically sound procedure for identifying latent classes. As Mammadov et al. point out, classification based on LPA directly invokes the probabilistic nature of class membership (through posterior probabilities) and involves clearer, model-based tests to inform decisions regarding the number of groups (latent classes) that can be reliably identified. Berlin, Williams, and Parra (2014) provide a good, general introduction to latent class procedures. More thorough treatment is provided by Masyn (2013) who provided an exhaustive methodological overview of latent class and latent profile analyses, including detailed recommendations regarding model estimation and fit, decision-making in the case of multiple competing and plausible models (likely a common occurrence), and interpretation. Hallquist and Wright (2014) provide an introduction to factor mixture modeling (FMM), a combination of confirmatory factor analysis to establish latent variables that are then examined for different latent class structures Lubke and Muthén (2005) provide a thorough coverage of additional model tests with FMM.

Mammadov et al. identified three latent profiles on the basis of personality scores in a sample of honors students: two with moderate levels of

most personality scores but with marked differences on openness, and another with relatively higher elevations on most personality scores but the lowest level on neuroticism compared to the other profiles. Castejón, Gilar, Miñano, and González (2016) provided another example of latent class cluster analysis (a variant of LPA) with a sample of gifted students (M_{age} = 12.5 years). They identified four profiles based on measures of general and differential abilities, creativity, and academic achievement. They labeled the classes, "high achiever and cognitive gifted," "creative gifted," "gifted achievers," and "cognitive gifted."

Factor Mixture Modeling Example

To our knowledge, model-based approaches such as LPA and FMM have not been used in studies combining attention on perfectionism and gifted/talented individuals. Similar to Mammadov et al., our example uses data from honors students but we extend their work by examining specific perfectionism dimensions and latent classes using FMM and a comparison sample of non-honors students.

We conducted factor mixture models based on three factors previously analyzed in the preceding section of the chapter (Standards, Discrepancy, and Perceived Stress). We began with a single-class baseline model (consistent with a three-factor CFA). We anticipated fitting up to a five-class model to accommodate up to four potential perfectionism classes found in prior cluster analytic and latent profile studies of perfectionism (e.g., Boone, Soenens, Braet, & Goossens, 2010; Rice et al., 2011). We also incorporated the known class variable of honors student status in the model testing. Fit was evaluated with the Bayesian Information Criterion (BIC), with the expectation that better-fitting models would produce lower BIC values. Relative entropy was used to gauge classification accuracy. Convergence problems and practical considerations such as class proportions should also be considered in evaluating and interpreting models.

The loglikelihood values for the 4- and 5-class model failed to replicate and other estimation problems raised practical concerns about the viability of those models. The BIC values for the one-class through three-class models were 21,778.66, 21,682.84, and 21,621.77, respectively. Entropy values for the two-class and three-class models were 0.93 and 0.89, indicating good separation of classes for each solution. With the lowest BIC, the three-class model was deemed most tenable. The proportions of students represented in the 1- through 3-class models are displayed in Table 14.1.

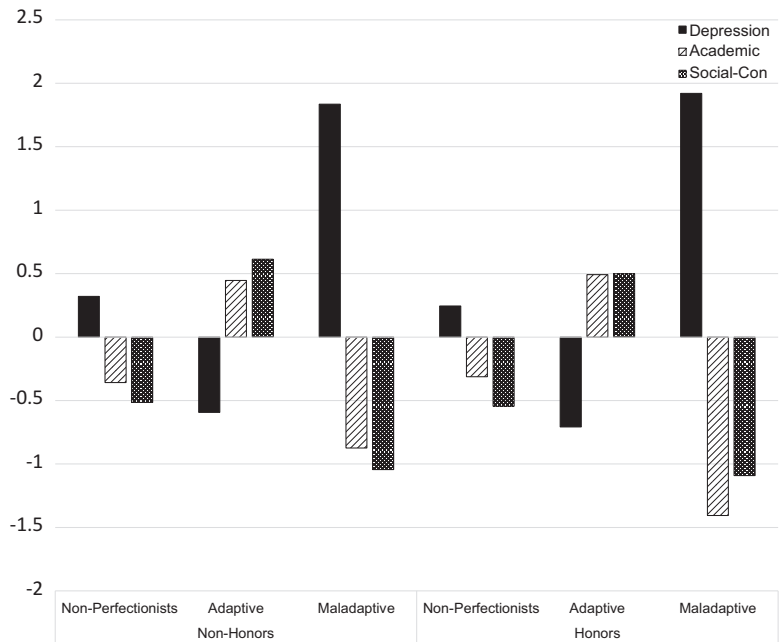
Table 14.1 Distribution of honors and non-honors students across factor mixture models

k-class model	Known class	Latent class	Count[a]	Overall proportion	Known class proportion
1	Non-honors	1	368	0.56	0.56
	Honors	1	290	0.44	0.44
2	Non-honors	1	306	0.46	0.83
	Non-honors	2	62	0.09	0.17
	Honors	1	237	0.36	0.82
	Honors	2	53	0.08	0.18
3	Non-honors	1	49	0.07	0.13
	Non-honors	2	262	0.40	0.71
	Non-honors	3	56	0.09	0.15
	Honors	1	35	0.05	0.12
	Honors	2	207	0.31	0.71
	Honors	3	48	0.07	0.17

[a]Rounded estimates for counts and proportions are based on posterior probabilities

Accounting for 71% of both student groups, class 2 was proportionally and substantially larger than the other classes. For interpretation, factor means for Standards, Discrepancy, and Perceived Stress in each class can be compared against a reference class. Table 14.2 presents the tests of those means. We also reevaluated means by against different reference classes (e.g., non-honors students in class 1, honors students in class 2). Based on comparisons with the reference groups, we developed tentative labels for the classes and those also appear in Table 14.2.

Class 2 and 3 in both student groups had comparable and higher factor mean levels of Standards (consistent with perfectionists) than class 1 (likely Non-Perfectionists). For the honors group, Discrepancy and Stress were also significantly higher in class 3 than in class 2. These patterns would be consistent with class 3 representing Maladaptive Perfectionists and class 2 denoting Adaptive Perfectionists. For the most part, the same general pattern was evident within the non-honors group, with class 3 (presumed Maladaptive) having substantially higher Discrepancy and class 2 having lower Discrepancy (presumed Adaptive). Class 3 in the non-honors group also had higher Stress than class 2 (again consistent with the Maladaptive label). The only deviation was that no difference in Stress emerged between class 1 and 2 for the non-honors students, though both groups were significantly lower than class 1 (Maladaptive) on Stress. In sum, in each student group, relative to other classes, there was one group with high Standards, low Discrepancy, and low Stress (presumed Adaptive), another with high Standards, Discrepancy, and Stress (presumed Maladaptive), and a third class with low Standards and mid-range Discrepancy (presumed Non-Perfectionists). Interestingly, the results also suggest that stress may be more of a concern for low strivings honors students who are Non-Perfectionists compared to their non-honors counterparts.



Class Differences in Depression, Academic Integration, and Social Connectedness

Table 14.2 Tests of factor means for standards, discrepancy, and perceived stress for the 3-class model

Knownclass	Class	Factor	*M*	SE	*z*	*p*	Tentative label
Non-Honors	1	Standards	−1.57	0.18	−8.75	0	Non-perfectionists
		Discrepancy	−1.96	0.26	−7.48	0	
		Perceived stress	−0.27	0.18	−1.49	0.135	
Non-Honors	2	Standards	−0.12	0.08	−1.41	0.159	Adaptive
		Discrepancy	−2.71	0.20	−13.28	0	
		Perceived stress	−0.47	0.12	−3.96	0	
Non-Honors	3	Standards	−0.09	0.11	−0.80	0.423	Maladaptive
		Discrepancy	0.09	0.25	0.34	0.732	
		Perceived stress	0.08	0.14	0.58	0.561	
Honors	1	Standards	−1.58	0.21	−7.40	0	Non-perfectionists
		Discrepancy	−1.98	0.34	−5.84	0	
		Perceived stress	−0.32	0.15	−2.15	0.032	
Honors	2	Standards	−0.10	0.09	−1.07	0.285	Adaptive
		Discrepancy	−2.88	0.21	−13.78	0	
		Perceived stress	−0.58	0.12	−5.04	0	
Honors	3	Standards	0	0	N/A	N/A	Maladaptive
		Discrepancy	0	0	N/A	N/A	
		Perceived stress	0	0	N/A	N/A	

Implications of Latent Profiles

To further examine differences between the classes, we compared profiles on other measures in the dataset for depression, college adjustment, and social connectedness (see Figure). Consistent with the class labels based on the perfectionism and stress, these results show a clear pattern of elevated difficulties for maladaptive perfectionists, better adjustment for adaptive perfectionists, and moderate levels between adaptive and maladaptive perfectionists on those outcomes for the non-perfectionists.

Summary of Measurement and Classification Approaches

Scales performed well in terms of measurement invariance analyses, which allowed for scrutiny of group differences in levels and implications of perfectionism. Similar to Mammadov et al.'s (2016) demonstration with higher-order personality factors from the five factor model, we found support for a three-class model for our sample of honors and non-honors students. Different from Mammodov et al., however, was our finding that the "typical" profile did not have elevations on a potential facet of neuroticism (self-critical perfectionism). Our results provided strong support for a number of similarities between honor and non-honors students, and unlike Chan's (2010) findings, neither student group appeared to be disproportionately represented by perfectionism, nor seemingly affected by perfectionism in different ways. Although most students were functioning quite well in terms of personal, academic, and interpersonal indicators, approximately 7–9% of the students appeared to be at risk for difficulties that might have something to do with problematic combinations of perfectionistic strivings and concerns.

Development of Perfectionism

Until this point, we have presented perfectionism in a way that might be accessible to most readers interested in individual differences or personality more specifically. That is, we have attempted to present various conceptualizations of the construct, address some thorny issues regarding measurement, classification, and comparisons between the gifted and nongifted, and link much

of the work in the study of perfectionism to the unsurprising conclusion that some forms of perfectionism may be better or worse than others. Not directly addressed but lurking in the literature reviewed and possibly in the minds of readers more familiar with giftedness and children, is that research in this area has been based on samples representing very different age groups. Parker's (1997) now classic study in this area was based on sixth graders. Wang et al. (2012) used a sample of 6th–12th graders ranging in age from 10 to 18 years. Dixon et al.'s (2004) cluster analytic study was based on high school juniors (average age of 16 years). The example used earlier in the demonstration of measurement invariance and factor mixture modeling was based on college students in honors programs (20 years old, on average; see also Miller, Lambert, & Speirs Neumeister, 2012). Similar to the points made earlier in this chapter regarding cultural considerations and adaptability of perfectionism, one can reasonably ask what is known about the development of, or change in, perfectionism over time.

One reason for a developmental lens, as Pfeiffer (2015) points out, is that "students should *not* necessarily be awarded the privilege of the gifted label for their entire schooling" (p. 39), in part because some students may not benefit from gifted programming or interventions, or may not demonstrate extraordinary performance relative to their peers *at a later time*. That is, there may be some shifts over time, some entries into and exits out of gifted programs, and essentially some instability in the construct or its consequences. Perfectionism might be considered similarly in light of other research that reveals some instability over time. In an impressive longitudinal study, Hong et al. (2016) found rather modest test–retest correlations in the 0.40 range for perfectionistic concerns when subjects were 8, 9, and then 11 years of age. Other longitudinal research on 6th–12th graders (Damian, Stoeber, Negru-Subtirica, & Băban, 2017) and young adults (Rice & Dellwo, 2002; Rice, Leever, Christopher, & Porter, 2006) revealed stronger, though far from perfect, test–retest correlations in the 0.60–0.80 range for perfectionistic strivings and concerns, though time spans only covered several months. Thus, like other individual differences, perfectionism develops in varied environmental contexts and, perhaps especially earlier in middle childhood, should not necessarily be considered inherently stable.

As Speirs Neumeister (2018) observed in her recent summary, much of the thinking and research on the development of perfectionism in the gifted can be organized according to (a) family factors, such as influences of parenting styles, parental expectations, social learning, and other family dynamics; (b) child factors, such as temperament, attachment style, and need for approval; and (c) environmental factors, such as schools and social/community expectations. Morris and Lomax (2014) reviewed childhood perfectionism and concluded that there was strong evidence linking "pushy" parenting (e.g., overprotection from mistakes, intrusive parenting to push children to achieve at certain levels) and perfectionistic concerns in children (e.g., Kenney-Benson & Pomerantz, 2005; Mitchell, Newall, Broeren, & Hudson, 2013). For example, several studies by Soenens and colleagues (Soenens, Elliot, et al., 2005; Soenens, Luyckx, Vansteenkiste, Duriez, & Goossens, 2008; Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005) have found that parents with high levels of perfectionistic concerns were likely to be psychologically controlling, which in turn predicted concurrent and prospective perfectionistic concerns with their adolescent children.

Rice, Suh, and Davis (2017) recently focused on attachment theory, person-centered theory, and self psychology to describe how perfectionism may develop as part of a process of regulating self-esteem and important tensions in key relationships during childhood. They argued that insecure bonds in parent–child relationships and parental behaviors that contributed to that insecurity probably leave children with an impaired value system that emphasizes performance over person, with neither ever being perceived as adequate, and likely sets an unfortunate foundation for self-critical perfectionism. Studies linking perfectionism with authoritarian parenting (e.g., Gong, Fletcher, & Bolin, 2015; Speirs Neumeister & Finch, 2006; c.f. Hibbard & Walton, 2014) and lack of parental responsiveness (i.e., lack of positivity and perceived warmth; Soenens,

Vansteenkiste, et al., 2005) would be consistent with those speculations.

In contrast, Rice, Suh, and Davis (2017) reviewed other work indicating that dependable parents who provide their children with clear and reasonable performance expectations but do not make their emotional support and positive attention contingent on performance, probably inspire children to pursue high but realistic standards, cope with challenges from a foundation of security and confidence, and develop healthy relationships with others. For example, perfectionists with high strivings and low concerns have reported relatively moderate parental expectations but low parental criticism compared to perfectionists with high strivings and high concerns (e.g., Parker, 1997; Rice & Mirzadeh, 2000). Enns, Cox, and Clara (2002) found that parental personal standards predicted perfectionistic strivings but harsh parenting (the combination of harsh parenting and parental standards predicted perfectionistic concerns) did not predict strivings.

Hong et al. (2016) studied children beginning at age 7 with the measurement of multiple predictors (e.g., child temperament, parenting behavior during a problem-solving task, cognitive abilities) and conducted follow-up assessments including measures of perfectionistic concerns at ages 8, 9, and 11. They identified three groups of children with different perfectionism trajectories: (a) high self-criticism that increased over time, (b) high self-criticism that decreased over time, and (c) low self-criticism that increased over time. Membership in the first two high self-criticism groups was predicted by earlier parental intrusiveness, but not by child temperament. Membership in the low but increasing self-criticism group was predicted by parents likely to use negative control behaviors such as harsh punishment or ignoring.

Challenge and Mindsets

Also addressed by Speirs Neumeister (2018) and emphasized here is another potentially intriguing area of research on the development of perfectionism that involves the influence of challenge or lack thereof early in gifted students' academic experiences. In a qualitative study, Speirs Neumeister, Williams, and Cross (2009) found that, for academically gifted high school students, early ability to achieve academically with little or no effort (lack of challenging curriculum) contributed to their expectations of perfection as the norm. A sample of gifted perfectionist college students interviewed by Neumeister (2004) similarly attributed their development of perfectionism to lack of early academic challenge, though self-oriented perfectionists indicated early academic successes contributed to their own expectations of perfection, whereas for socially prescribed perfectionists, early achievement led to others' expectations of their continued perfection in school.

These findings are consistent with Dweck's (2012) work on child and adolescent students' self-theories of intelligence or mindsets. Dweck distinguishes between fixed mindsets, beliefs that intelligence is an immutable trait, and growth mindsets, the belief that intelligence can be incrementally improved through continued effort over time. Dweck points out that the experience of many gifted students, who early in their studies receive frequent praise for high achievement with little effort, is fertile ground for the development of a fixed mindset. Students with a fixed mindset often equate their self-worth with their grades, which can cause them to interpret the intellectual challenges gifted students face later in their development as threats to their self-concept that are better avoided.

Supporting these propositions, Damian et al. (2017) found that in a longitudinal study of Romanian adolescent students, high academic achievement influenced the development of both perfectionistic strivings and perfectionistic concerns. Damian and colleagues studied adolescents ranging in age from 12 to 19, which they point to as crucial in the inculcation of perfectionism due to the increasing emphasis on evaluation, competition, and comparison in the school and social environment. Nevertheless, their study likely only captured developmental changes in perfectionism occurring well after the influential early academic successes observed in

previous qualitative studies. Recall as well the findings suggesting greater fluctuation or instability in perfectionistic characteristics for children in the 8–11 age range (Hong et al., 2016) compared with middle and late adolescents (e.g., Damian et al., 2017). Further longitudinal research could be conducted with younger children to determine whether academic achievement and lack of challenge at earlier ages does in fact predict the development of certain forms of perfectionism. Additionally, longitudinal research on early interventions such as pull-out programming, acceleration, and ability grouping will provide a more definitive view of the interaction between achievement, challenge, and perfectionism.

Generality or Domain Specificity of Perfectionism

The preceding attention on the development of perfectionism and some implications with giftedness, along with Pfeiffer's (2015) points that students (a) may need to be periodically reassessed and could cycle in and out of gifted programming, and (b) may not necessarily be detected as gifted despite their potential for giftedness, remind us that individual differences in intellectual and personality factors can reflect considerable within-person variation as well as temporal instability. Another aspect of such diversity is an appreciation that "one size does not fit all" in the area of giftedness. For example, as noted earlier, gifted children might be identified based on a very high level of general intelligence (*g*) or based on very high levels of abilities in specific domains (e.g., quantitative reasoning). A child might be gifted in the area of music but not in the area of literature. As with other constructs such as perfectionism, there may be a higher-order designation comprised of multiple facets representing diverse within-construct variation. Accounting that diversity may strengthen predictive models involving the construct.

For example, there is good evidence that lower-level or more specific personality characteristics provide substantial incremental validity in the prediction of a variety of behaviors, including academic performance, compared with broader personality dimensions (Noftle & Robins, 2007; Paunonen & Ashton, 2001). Similarly, the effects of perfectionism on academic and other outcomes also have been relatively independent of the contributions of more global personality characteristics, such as neuroticism and conscientiousness (Dunkley, Sanislow, Grilo, & McGlashan, 2006; Rice, Ashby, & Slaney, 2007). Thus, there is good precedent and a strong rationale for examining within-factor facets or sub-factors that might reveal important individual variations.

An interesting extension of this theme in moving from the general to the specific has reemerged in recent years in studies of perfectionism. The question is whether expressions of perfectionistic strivings and concerns should themselves be considered generally broad personality characteristics that have implications for multiple areas in one's life or aspects of personality that are more limited in reach to only specific areas of importance to an individual. As noted earlier, Shafran's definition of perfectionism, for example, makes it clear that perfectionism need only be problematic "in at least one highly salient domain, despite adverse consequences" in order to be of clinical significance (Shafran et al., 2002, p. 778).

Earlier work in this area came from Rhéaume, Freeston, and Ladouceur's (1994) scale development research in which they identified 22 life domains that might be affected by perfectionism. Based on a qualitative, interview study of identified perfectionists, Slaney and Ashby (1996) derived a nearly universal domain mentioned by 36 of the 37 their subjects, termed "professional or academic work," followed by several other domains such as relationships, housework/cleaning, parenting, and hobbies. Both of these earlier studies also revealed some challenges in conducting this kind research. For example, in the list provided by Rhéaume et al. were domains such as "presentation of documents," "health," and "children's education" that might be open to various interpretations. Others such as "bodily hygiene," "physical

appearance," and "dress" may not be obviously distinct for some respondents. Both sets of researchers also included some version of housework or domestic chores that might suggest gender or socioeconomic covariates requiring additional consideration.

Stoeber and Stoeber (2009) examined the "domain" question across 22 different life domains, such as work, studies, and physical appearance. More recently, Haase, Prapavessis, and Glynn Owens (2013) evaluated perfectionism in five broad but typical life domains: university/work, relationships, physical activity, domestic environment, and appearance. Both sets of researchers found more support for the domain-specificity of perfectionism than they did for perfectionism as a global construct. They also converged on finding, similar to Slaney and Ashby (1996), that the work or academic/university was most commonly affected by perfectionism. Additional evidence for the domain specificity of perfectionism that was more relevant to a focus on giftedness was provided by McArdle (2010). His sample of academically talented youth had significantly higher levels of perfectionism in the school domain than the sport domain, which was related to their perceived value of and contingent self-worth in the respective domains. This finding was further supported by Dunn, Dunn, and McDonald (2012), who reported that domain-specific perfectionism in an intercollegiate, student-athlete sample was greater in sport than in academics, and was positively related to how competent the athletes thought themselves in the domain and how important the domain was to them.

An important additional aspect of the Haase et al. (2013) study is worth considering with respect to the relative advantages and disadvantages of strivings and perfectionistic concerns. Haase et al. measured domain-specific "positive" and "negative" perfectionism. Positive perfectionism reflects strivings with motivations associated with perfectionism such as taking pride in being meticulous or enjoying one's outstanding performance. Negative perfectionism reflects perfectionistic concerns with motivations to avoid negative consequences, or to more simply feel negatively when striving for perfection. Using items from a general measure of positive and negative perfectionism (Terry-Short, Owens, Slade, & Dewey, 1995) tailored to be domain-specific, Haase et al. not only found support for the domain-specific approach, but also reported differences in the valence of perfectionism for the domains, and that some domains were more likely to be rated higher or lower as a function of gender. For example, higher levels of positive perfectionism were reported by women for the university/work domain and by men for the physical activity domain.

Perhaps a clear implication of these findings is that perfectionism may only be adaptive or maladaptive for the gifted if the focus of the perfectionism is on a particular area of a person's giftedness or talent, but has no other effects on a person's life. Alternatively, what may be adaptive is to focus the strivings on one particular area whereas what might be maladaptive is to have high performance expectations in multiple areas of one's life. Thus, accounting for domain-specificity in perfectionism may account for inconsistencies in past studies of the implications of perfectionism for the gifted. Moreover, a related complexity in this area of research for future work to address is likely to involve stronger methodologies to parse important within-subject variation (e.g., some domains are likely to be more important to others at the individual level) and between-subject variation (e.g., gender, race/ethnicity, socioeconomic, and other factors) that may also affect domain-specific perfectionism and its implications.

Interventions

Whether considered a latent class or a dimensional construct, considerable research has supported detrimental outcomes for perfectionistic concerns (maladaptive perfectionists) for a variety of samples. As multiple summaries recently attest, maladaptive perfectionism has consistently been associated with higher psychological distress and social-relational difficulties (Sirois & Molnar, 2016; Stoeber, 2017). One explana-

tion for the distress is that maladaptive perfectionists likely engage in poor stress management and coping. In a sample of gifted middle schoolers, Mofield and Peters (2015) found that unhealthy perfectionists displayed higher levels of internalizing avoidant coping than "functional" perfectionists (those with high personal standards comparable to unhealthy perfectionists, but with lower perfectionistic concerns). Functional perfectionism was not differentiated by approach-oriented coping. Dunkley (2017) provides a thorough summary of research supporting the relation between perfectionism, daily stress, and coping. Other work points to ineffective emotion regulation strategies for maladaptive perfectionists (Rice, Gnilka, et al., 2017; Richardson, Rice, & Devine, 2014). With a problematic combination of poor coping and psychological difficulties, such perfectionists seem like a reasonable target for intervention.

Unfortunately, some past research indicated that the most self-critical maladaptive perfectionists have also been identified as a particularly challenging group to treat (Blatt, Quinlan, Piklonis, & Shea, 1995). In clinical populations, maladaptive forms of perfectionism are associated with poorer outcomes in the treatment of several mental health problems (Egan, Wade, Shafran, & Antony, 2014). Maladaptive perfectionism may interfere with a client's ability to engage effectively in the working alliance between therapist and client that is crucial to efficacious treatment outcomes (Zuroff et al., 2000). Maladaptive perfectionistic clients may adopt unrealistic expectations for their treatment, strive to be the perfect client, and experience distress or disengagement when they perceive themselves falling short of expectations (Sorotzkin, 1998). These and other important dynamics in treating perfectionists have recently been addressed by Hewitt, Flett, Mikail, Kealy, and Zhang (2017). Also, and perhaps especially relevant for giftedness, perfectionists are often reluctant to relinquish the high standards they see as central to their ability to achieve, which might manifest in defensiveness or resistance.

Despite the difficulties in treating perfectionists, some limited but promising effects were reported in a meta-analysis conducted by Lloyd, Schmidt, Khondoker, and Tchanturia (2015), and a recent volume has compiled an impressive set of strategies that could be used in cognitive-behavioral therapy (CBT) targeting perfectionism (Egan et al., 2014; see also Egan & Shafran, 2017). There are also mindfulness, self-help, and online interventions that have shown promise (Pleva & Wade, 2007; Radhu, Daskalakis, Arpin-Cribbie, Irvine, & Ritvo, 2012; Wimberley, Mintz, & Suh, 2015). The intervention literature on child and adolescent perfectionists is sparse. In their review of the five intervention studies they found in the area, all preventative interventions conducted with nonclinical populations, Morris and Lomax (2014) found that on average, group-based programs designed to reduce anxiety or perfectionism were successful in producing significantly lower perfectionism scores.

The preventative or additive developmental approach to intervention tested in the above studies is consistent with those used in domains where much of gifted talent development occurs outside of the school setting, such as in sports and the performing arts. In her call for the integration of psychosocial strength training into all domains of gifted talent development, Subotnik (2015) points out that in the training of adolescent elite athletes and in Juilliard's precollege program for young performing artists, psychosocial skills such as focus, emotional regulation, goal setting, and productive coping are taught and practiced explicitly, often with individualized feedback. This is in contrast to academically gifted students, who are left to learn these skills on their own, or through experiences outside of school (Subotnik, Olsewski-Kublilius, & Worrell, 2011).

As gifted children follow the developmental trajectory of their domain, psychosocial skills help them maintain motivation, learn from challenges and failure, seek and utilize opportunities, and successfully negotiate the important transitions as they develop raw ability from potential to competency to achievement and finally to eminence in their domain. These psychosocial skills become increasingly important

in later stages as the determinant of achievement shifts from ability to motivation and task commitment. Pfeiffer similarly endorses the instruction of gifted students in what he calls heart strengths, "character strengths, virtues, and intra- and inter-personal competencies" such as humility, persistence, kindness, gratitude, enthusiasm, and playfulness, that allow students to navigate and cope with the behavioral, social, and emotional demands of performance-oriented environments (Pfeiffer, 2012, 2016, p. 4). Subotnik and Pfeiffer's recommendations are congruous with research suggesting coping strategies are promising targets of intervention to protect gifted students from the negative aspects of perfectionism (Dunkley, 2017; Gnilka, Ashby, Noble, 2012; Luo, Wang, Zhang, Chen, Quan, 2016; Park, Heppner, & Lee, 2010).

With their tendency toward dysfunctional coping, elevated stress levels, high cognitive abilities, and reluctance to change, gifted maladaptively perfectionistic students also may be good candidates for the so-called "wise" interventions: theory-derived, brief interventions that target specific psychological processes in subtle ways to produce change (Walton, 2014). Examples include values or self-affirmation to reduce stress (Sherman, 2013; Taylor & Walton, 2011), altering implicit personal theories of personality (Yeager et al., 2014), and enhancing social belonging through "saying-is-believing" (Walton & Cohen, 2011). Self-affirmation runs counter to what highly self-critical, maladaptive perfectionists are likely to experience, but may benefit from. Likewise, interventions aimed at facilitating or enhancing social connections with others are likely to shore up important coping resources that can be tapped to help reduce adverse effects of current and later stress. Finally, interventions aimed at subtle adjustments to the fixed or flexible ways in which people tend to think about personality also hold promise for interventions aimed at perfectionism, especially given the cognitive rigidity associated with higher levels of perfectionistic concerns (Rice, Vergara, & Aldea, 2006).

Values Affirmations

Self or values affirmations interventions involve subtle techniques designed to circumvent defensiveness and activate internal and intrinsically valued resources that can be used in challenging, stressful situations (Sherman, 2013). A key element in self-affirmation theory is that people are motivated to maintain self-integrity, and effectively control and cope with various challenges in life. The manipulation is designed to activate these motivations. In a typical manipulation, treatment group participants select their top personal values from a provided list, write about why those values are important to them, and rate their importance whereas control participants select and write about values that important to others. See Cohen and Sherman (2014) and Sherman (2013) for more details.

As a relevant performance-related example of values affirmations, Sherman et al. (2009) found that affirmation buffered the stress-inducing effects of a midterm exam for college students. On the morning of the exam, students in the nonaffirmed (control) condition had an increase in epinephrine (a catecholamine indicated in stress reactivity) but students who had engaged in the affirmation (treatment) intervention did not show that increase. The affirmed group also outperformed the control group on the exam. The positive effects of affirmation in that study, as seen in others, were most conspicuous among students with the greatest concerns about consequences of performing poorly on the exam. Creswell et al. (2005) found similar effects on salivary cortisol in a threat manipulation as a function of self-affirmation. Tang and Schmeichel (2015) reported effects of a self-affirmation intervention on cardiovascular indicators when subjects received interpersonal insults as feedback.

Somewhat counterintuitively, the effectiveness of self-affirmation erodes when subjects perceive the intervention as a "means to an end," as some kind of extrinsic technique bestowed by others to be applied by "targeted" (inadequate) individuals when they encounter a stressful situation; in those situations, subjects are more likely

to experience the intervention as a threatening act of control or stigmatization, and understandably will be more defensive in reaction to the intervention. Indeed, several studies (e.g., Sherman et al., 2009; Silverman, Logel, & Cohen, 2013) have shown that, "when participants are told that the affirmation is expected to benefit them, or simply led to see a connection between it and the outcome measure, its impact decreases" (Cohen & Sherman, 2014, pp. 359–360). Sherman et al. (2009, p. 761) concluded with "a perhaps counterintuitive suggestion for those interested in applying self-affirmations in field settings. The key to an effective affirmation intervention may lie in the subtlety of its delivery and the minimalism of its administration. More transparent affirmations, those that are explicitly broadcast as "academic interventions" or "stress-reducers" by contrast, may raise awareness and reduce effectiveness.

Social Belonging

As indicated earlier, there is not necessarily a reason to suspect that the gifted are any more or less problematically perfectionistic than nongifted students. However, there is strong evidence to indicate that, the most maladaptively self-critical perfectionists are likely to feel disconnected from others. The Social Disconnection Model charts the various ways in which perfectionistic strivings and concerns can lead to psychological problems through links with relationship and social difficulties (Sherry, MacKinnon, & Gautreau, 2015). Thus, the common social disconnection difficulties of self-critical perfectionists might be improved through interventions directly but subtly targeting social belonging.

Participants in social belonging interventions come to interpret their stressful experiences as common (shared connection with others) and temporary rather than pessimistically chronic. As pointed out by Walton (2014, p. 76), a key mechanism in such interventions is that participants shift their understanding of struggles from evidence that they do not belong in a particular context or situation to an appreciation of such struggles being typical or normal difficulties experienced by others in that situation. That is, such interventions create an "alternative narrative" that normalizes difficulties and thereby enhances social connection. Especially for at-risk groups, social belonging interventions have been credited with positive health and performance outcomes (see Walton, 2014, for a comprehensive summary). As one example, Walton and Cohen (2011) used a "saying-is-believing" manipulation to instill a sense of belonging. Participation in their study was presented as an opportunity for participating students to help future classmates adjust to campus and college environment. Participants read a prompt summarizing a "study" in which researchers had found that feelings of social isolation are common across all groups of people and those feelings of isolation are short-lived. Walton and Cohen then helped participants internalize that basic message by prompting them to write about how their own experiences were similar to those conveyed in the "study" they just read. The participant created a speech from the essay that was then recorded. The participants had been informed that the materials they produced would be used with future students to help with their adjustment to the new university. Although the subjects had the impression they would be aiding other future students, the subjects themselves were the focus of the study.

Walton and Cohen (2011) reported impressive long-term outcomes from the study, particularly for the African American students who were a main focus of their study. Those who received the social belongingness intervention, compared with African American students in the control group, had substantial increases in GPA over the three subsequent years students were tracked. They also had higher levels of health (both in terms of perceived health and in doctor visits), and higher levels of happiness. Health and happiness are two positive outcomes in short supply among maladaptively self-critical perfectionists (Sirois & Molnar, 2016; Stoeber, 2017), again pointing to the relevance of such interventions for that particular at-risk group.

Changing Beliefs About Personality

Other interventions relevant to perfectionism studies might implement procedures for changing beliefs about personality. Such an intervention might help self-critical perfectionists shift their understanding of personality and adopt a more flexible and ultimately more adaptive view of self and others. Based on ideas drawn from entity and incremental theories of intelligence, the central concept in implicit theories of personality is whether personality is viewed as fixed or malleable (Yeager et al., 2014). Shifting to a more flexible understanding of personality ostensibly seems similar to other interventions in this set that presumably are effective because they create an alternative narrative. In the case of implicit beliefs about personality, the shift to an incremental narrative about personality opens one up to the potential for change. That is, during stress for example, it is more likely that divergent coping strategies can be entertained and implemented if someone adheres to an incremental rather than entity narrative about personality. A related point is that the effects of implicit theories are only evident during challenging situations. As Yeager et al. (2014, p. 868) note, "Just as the belief that intelligence is fixed is not threatening when school is easy (Blackwell, Trzesniewski, & Dweck, 2007), the belief that people's socially relevant characteristics are fixed is not likely to lead to helplessness when there is no threat to one's social status (see Chen, DeWall, Poon, & Chen, 2012)."

In several studies of adolescents, Yeager et al. (2014) demonstrated that such an intervention pays off in terms of lower stress, and better health and academic performance. The experimental manipulation was aimed at enhancing an incremental view of personality. Specifically, ninth graders in the treatment condition were presented with information through what was presumably an article in Psychology Today that researchers had found support for a growth mindset (incremental theory) of personality. Participants were prompted to select the most important points made in the article, and particularly the most relevant things students would need to know in order to use the growth mindset. Finally, students were prompted to write their own version of a narrative description of the growth mindset similar to anecdotes that were part of the magazine article. Their narrative was supposed to draw on their own school experiences that would then be shared with future ninth graders (recall the "saying-is-believing" social belonging intervention described earlier). Compared with the control group, this single time intervention was associated with higher subsequent grades or, more accurately less of a decline in grades that was experienced by students over the course of the ninth grade year. Intervention subjects also reported less global stress and fewer health problems 8 months later.

Summary

Subtle interventions such as the ones described may hold considerable promise for maladaptive perfectionists because they circumvent barriers that perfectionistic youth might be especially attuned to, such as being singled out for intervention or treatment (i.e., somehow flawed or inadequate) and then experiencing corresponding stigma or shame. These kinds of more global and preventive interventions seem likely to help those at risk and unlikely to harm those not at risk. They also represent a more efficient use of social-emotional intervention resources which may be limited in many educational settings. However, to our knowledge, they have not been extensively examined in studies of perfectionism. In a preliminary study, our lab has found that a values affirmation treatment interacted with strivings and concerns to produce less anticipatory anxiety for a math test, and that lower anticipatory anxiety then led to better performance on the test. The effect was most pronounced for students with high levels of both strivings and concerns (maladaptive perfectionists), the group likely most at risk for strong stress reactivity and impaired academic performance when stressed.

Conclusion

Although several models and corresponding measures of perfectionism are actively used in perfectionism research, considerable evidence has mounted that the higher order factors of perfectionistic strivings and perfectionistic concerns are the key constructs to attend to in perfectionism. Classification analyses suggest that the incidence of perfectionism in gifted populations is the same or less than in nongifted and tends to be more adaptive, but current methodological tools such as latent profile analysis and factor mixture modelling should be utilized moving forward, which may help to provide more valid evidence to help understand these questions. Measurement invariance for measures must also be addressed before group comparisons can be made accurately between gifted and nongifted populations, between subgroups within the gifted population (e.g., gender or age-group comparisons), or over time.

The prevalence of perfectionism in the gifted may not be out of step with that of the nongifted, but there is compelling evidence that a subgroup within the gifted could be classified as maladaptive perfectionists who strive for high performance expectations, perceive their efforts as inadequate, and engage in harsh self-criticism as a result. Members of this subgroup may not be directly underperforming, but these tendencies make it more difficult for them to progress through the developmental trajectory of their domain in a way that maximizes their potential. A key mechanism for the influence of perfectionism on these difficulties is maladaptive coping, establishing it as an important target of intervention that warrants further study. The empirical intervention literature addressing maladaptive perfectionism in the gifted seems inadequate. The gifted may benefit from interventions targeting maladaptive perfectionism and enhancing psychosocial skills, though perfectionistic processes may also dampen the effects of such interventions. As a way to circumvent potential dampening, wise interventions that subtly activate processes related to self-theories, social connection, or self-affirmation represent a promising path toward lessening the negative effects of maladaptive perfectionism that is worth investigating with gifted populations.

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15 Depression, Suicide, and Giftedness: Disentangling Risk Factors, Protective Factors, and Implications for Optimal Growth

Christian E. Mueller and Denise L. Winsor

Abstract

Although exact incidences of depression and suicide among the gifted remain unknown, they are most likely in line with that of the larger student population. In the present chapter, we invoke two theoretical frameworks—person–environment fit theory and the Differentiated Model of Giftedness and Talent Development—to understand how *intrapersonal*, *interpersonal*, *environmental*, and *developmental* risk and protective factors manifest uniquely for gifted student populations. To better reflect the current status of gifted student development in the twenty-first century, we place special emphasis on two recent trends: social media use and cyberbullying, in addition to reviewing traditional literature as it relates to risk and protective factors. We place much emphasis on understanding possible unique contributors to the development of depression and suicide ideation among gifted students, but also on providing strategies for helping parents, teachers, and other caregivers. Implications of this chapter are for those who are interested in developing intervention strategies that consider developmental as well as epidemiological factors when exploring depression and suicide among the gifted.

Introduction

Growing up as a gifted child or adolescent in the twenty-first century can be a complex and unpredictable experience that carries with it unique opportunities for growth, but also unique challenges for the parents, teachers, and other caregivers who guide these individuals from childhood and adolescence into adulthood. Individual differences in adaptability and responsiveness rely on the interplay among *intrapersonal*, *interpersonal*, *contextual*, and *developmental* factors (e.g., Bronfenbrenner, 1994; Gagné, 2004, 2009). Essentially, intrapersonal factors are those found within the individual, such as with self-concept, self-esteem, or other self-beliefs. Interpersonal factors refer to interactions with other individuals, such as with peers, friends, teachers, and family members. Contextual or environmental factors refer to those factors that can exert a direct or indirect influence on student growth and development, such as through social media. Lastly, developmental factors relate to how intrapersonal, interpersonal and contextual factors intersect to impact growth trajectories

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differently during childhood, adolescence, and adulthood. Although these broad conceptions can be found across disparate theoretical frameworks (e.g., Flay, Snyder, & Petraitis, 2009), they offer a useful way for exploring how depression, suicide, risk, and resilience may uniquely manifest for gifted children and adolescents in the twenty-first century.

While the main focus of this chapter is to review the most recent and relevant theory and research on depression and suicide as it manifests for twenty-first century gifted children and adolescents, we also present and discuss practical suggestions for helping caregivers as they help gifted students along their burgeoning developmental pathways. For reasons outlined here in the present chapter, whether one considers gifted children and adolescents as being at risk or resilient to psychosocial adjustment issues, depends upon how one views the overall path of gifted student development. Historically, for example, when discussing social/emotional development among gifted students, two contrasting views have emerged (Neihart, 1999). First, is the prevailing view that gifted students are at greater risk for psychosocial adjustment problems, because of increased vulnerability due to issues such as asynchronous development (Alsop, 2003; Bailey, 2011; Silverman, 1997), maladaptive perfectionism (Dixon, Lapsley, & Hanchon, 2004), social introversion (Neihart, Reis, Robinson, Moon, & National Association for Gifted Children, 2002), and heightened sensitivity (Cross & Andersen, 2015, p. 79). The contrasting view is that gifted children and adolescents may actually be better equipped than their nonidentified peers to navigate and respond successfully to inherent challenges during adolescent transitions. The thinking here goes that at the individual level, gifted characteristics mirror resiliency characteristics in many ways (Bland, Sowa, & Callahan, 1994), and at the interpersonal or environmental level, because of their heightened sensitivity and advanced cognitive ability, gifted children and adolescents may be better equipped to seek out and utilize available resources during times of risk and growth (Kitano & Lewis, 2005). As discussed later in the chapter, this may be especially true as gifted adolescents increasingly turn to technology and social media as ways to cope with their changing worlds (Housand & Housand, 2012; Michikyan & Suárez-Orozco, 2016).

Proposed Framework for Exploring Depression, Suicide, Risk, and Resilience Among Gifted Children and Adolescents

Before detailing the research as it relates specifically to depression, suicide, risk, and resilience among gifted children and adolescents, it may be beneficial for readers to explore two additional conceptions as they may shed light on adaptability and responsiveness: that of *person–environment fit* (P-E) theory (Eccles, Wigfield, Midgley, & Reuman, 1993; Hunt, 1975; Roberts & Robins, 2004) and Françoys Gagné's differentiated model of giftedness and talent (DMGT; Gagné, 2004, 2009). P-E fit theory is useful for exploring risk factors for depression and suicide among the gifted, because gifted student adjustment is appropriately explained through psychological congruence or mismatch between the individual and their environment (Mueller, 2009; Silverman, 1997). Furthermore, Gagné's DMGT model is useful for exploring resiliency as it relates to depression and suicide among the gifted, because it offers a way to categorize broad factors that may work in a protective fashion such as through social support (e.g., Olszewski-Kubilius, Grant, & Seibert, 1994; Rinn, Reynolds, & McQueen, 2011). Combined, these frameworks can explain how a lack of psychological congruence (i.e., person–environment fit theory) and differentiated developmental pathways for gifted students as explained through intrapersonal, interpersonal and environmental interactions (i.e., DMGT), can exert unique influence on gifted student adjustment. Next, we provide a brief overview of each framework and discuss how they relate specifically to risk and resiliency for depression and suicide among the gifted.

Person–Environment Fit Theory

Hunt (1975) originally proposed that observed behavioral (B) differences among individuals is best described as a function of both the person (P) and the environment (E). He suggested that the relationship between an individual and their environment, and its subsequent influence on behavior, is best understood as being interactive, taking a developmental course, exerting reciprocal influence, and that understanding of the B-P-E relationship should lead to practical understanding and solutions about structuring responsive environments. Eccles et al. (1993), referring to this interaction as *stage–environment fit*, showed how changing physiological and psychological development in early adolescents was often in conflict with the way that learning environments were structured in typical middle schools. They note:

> "In essence, we are suggesting that it is the fit between the developmental needs of the adolescent and the educational environment that is important. Imagine two trajectories: one a developmental trajectory of early adolescent growth, the other a trajectory of environmental change across the school years. We believe there will be positive motivational consequences when these two trajectories are in synchrony, that is, when the environment is both responsive to the changing needs of the individual and offers the kinds of stimulation that will propel continued positive growth…In contrast, negative motivational consequences will result if the two trajectories are not in synchrony." (p. 91)

Although Eccles and her colleagues focused primarily on the negative impact of psychological incongruence on academic motivation, the notion of P-E fit has been extended to personality development (Roberts & Robins, 2004) and extends to gifted student development, as well. For example, Jackson and Peterson (2003) and Versteynen (2001) suggest that as level of giftedness increases (i.e., higher IQ), the level of mismatch between gifted students and their environments also increases, thus leading to difficulties in relating to family and peers (Mueller, 2009). Consequently, this can contribute to feelings of social isolation, which in turn may lead to experiencing depressive symptoms or contemplating suicide (Cross & Cross, 2018). Similarly, Silverman (1997, 2002) suggested that gifted students may often perceive themselves as being different—that their heightened sensitivity, intensity, and insight combined with their advanced cognitive ability, often put them ahead developmentally of their age-mate peers, thus causing them to experience asynchrony or to be "out of sync" with others in their family and school environments. Much the same as may happen with early adolescents, gifted students may often experience a "double-whammy" in P-E terms. In other words, all along their developmental paths, gifted students are often not only out of sync with their immediate environments, but the immediate environment may also be ill prepared to respond appropriately to attenuate risk and simultaneously promote growth (Hunt, 1975; Silverman, 2002). Consequently, as we explore later, depression and suicide may often accompany these feelings of asynchrony or social isolation (Pfeiffer & Stocking, 2000).

Françoys Gagné's Differentiated Model of Giftedness and Talent

Much in the same way that P-E fit theory can be adapted to explain risk factors as they relate to the manifestation of depression and suicidal ideation among gifted children and adolescents, Gagné's DMGT model[1] likewise offers a useful way to organize protective factors that may attenuate risk for depression and suicide among the gifted. It should be pointed out that Gagné's original intent for his model was to present a "talent development" perspective on giftedness, rather than one that emphasizes giftedness as mere innate ability (Renzulli, 2002). However, the DMGT model is particularly appropriate in the context of the present chapter for three reasons: first, it applies specifically to gifted student development, and can thus be extended to exploring issues related to psychosocial development; second, it offers a developmental perspective in

[1]Readers not familiar with this model should see Gagné (2004) and Gagné (2013).

explaining growth, which is a primary focus of the present chapter; and finally, it offers a taxonomy to organize possible protective factors. According to Mueller (2009), protective factors such as those described in the present chapter often fall into three broad categories:

> "Personality or individual (e.g. self-esteem; Carbonell et al., 2002), family cohesion (e.g. parent-family connectedness, Resnick et al., 1997), and environmental support (e.g. school belonging; Resnick et al., 1997)." (p. 5)

Furthermore, these factors may interact differently depending upon what developmental stage a gifted student finds himself or herself. For example, it has been found that family and school support remain particularly important as a way to buffer against depression (Meadows, Brown, & Elder, 2006), especially among gifted adolescents (Dunn, Putallaz, Sheppard, & Lindstrom, 1987; Mueller & Haines, 2012).

Unique Growth Trajectories for Gifted Children and Adolescents

During transitions—from childhood into adolescence, within the period of adolescence (early, ages 11–14; middle, ages 15–17; late, ages 18–21), and from adolescence into adulthood, gifted students have unique opportunities for growth, but also challenges that may lead to maladjustment. During adolescence, individuals undergo dramatic and substantial changes to their cognitive, emotional, and behavioral development, as well as to their role expectations (Arnett & Taber, 1994). For gifted children and adolescents, these changes accompany unique experiences. For those who view giftedness from a risk perspective, cognitive changes often put gifted students "out of sync" with their school and home environments. In other words, advanced cognitive ability (and subsequent cognitive changes) makes it difficult for gifted students to relate to peers, teachers, family members, and others; often, because the environment is ill-matched for individuals with advanced intellectual capacity. And this is especially true when instructional environments do not mesh with intellectual capacity (Mueller & Winsor, 2016). Over time, these feelings of being out of sync may lead to feelings of social isolation and withdraw, which in turn, may lead to experiencing depressive symptoms and for some, contemplating suicide. Emotionally, gifted students may also be out of sync with their school and family environments, and as a result, this puts them at far greater risk for experiencing depression or contemplating suicide (Gross, 2002). According to O'Connor (2002), Dabrowski's (1964) Theory of positive disintegration is an appropriate lens through which to view social/emotional development of gifted students. Although the theory is somewhat complex, essentially gifted students experience their lives with "greater intensity and sensitivity" (p. 55). In turn,

> "Many individuals with elevated overexcitabilities attempt to hide or learn to control their intensities and sensitivities in order to conform to the expectations of others (Lewis, Kitano, & Lynch). Silverman acknowledges the position of such individuals, explaining that 'Feeling everything more deeply than others do is both painful and frightening' (p. 17)." (p. 56)

From a risk perspective, current giftedness research also provides insight as to how role expectations are unique for gifted students, especially as these expectations sometimes force gifted children and adolescents into "an earlier psychological maturity" (Olszewski-Kubilius, 2002, p. 209). According to Arnett and Taber (1994), changing role expectations accompany certain rites of passage, or the assuming of increasing levels of independence and maturity; for example, finishing formal schooling, getting your first job outside the home, and getting married. Although debatable, many consider these rites of passage to be universal. Everyone goes through them. For some gifted students, encountering these rites of passage may come before they are emotionally mature enough to handle the accompanying responsibilities; however, because of their advanced intellectual capacity or social interaction styles (i.e., high verbal ability), parents and teachers may treat them as being more emotionally ready than they actually are. In turn,

the gifted student may experience stress (which they do not possess the coping skills to deal with), which can eventually lead to depression or thoughts of suicide. Here, the "P-E double-whammy" may come into play again, because at a time when the gifted student's social and emotional needs are becoming more important, those in the immediate environment may actually react in ways that increase stress and force maladjustment. One example that may be unique for gifted students is when parents and teachers hold unrealistically high academic expectations (Ablard & Parker, 1997; Kolb & Jussim, 1994), which sometimes leads to anxiety, depression. or feelings of suicide. Again, contrary to common belief, social relationships such as those found with parents (and caregivers) and teachers often remain essential for psychosocial health and well-being during the adolescent years (Mueller & Winsor, 2016; Pfeiffer & Stocking, 2000).

Risk Factors Applied to Gifted Children and Adolescents

Coming full circle, we next turn our attention to specific risk factors that may impact incidence rates for depression and suicide among gifted children and adolescents. According to Pfeiffer and Stocking (2000), risk factors that may be unique for academically gifted children and adolescents—"both those internal to the gifted youngster, and those external environmental and family factors" (p. 85)—can be characterized across five areas. They note,

> "[First], The gifted student's uneven or asynchronous development across the cognitive, emotional, social and physical domains is a significant risk factor…;[second], the unrealistic expectations of parents, teachers and significant others…often coupled with excessive and inappropriate use of praise for the gifted student's accomplishment of any task, leading to a warped sense of ability and success…;[third], related to unrealistic parental expectations, is parental over-involvement or enmeshment…;[fourth], gifted students as a group frequently suffer from a mismatch between their capabilities and the instructional environment. Teachers may feel that, because of his high intelligence, the gifted child will 'do fine' even without special attention or opportunities…; [and, fifth], the gifted student is particularly vulnerable to social and emotional problems resulting from difficulties with the peer group, either in terms of having trouble finding an appropriate peer group or reaching acceptance within the desired group." (pp. 85–86).

Furthermore, they note that certain personality factors such as perfectionism, excitability, moral sensitivity, gender, twice-exceptionality, and being a member of a disadvantaged group all increase likelihood of developing psychosocial symptomology, including depressive symptoms or suicide ideation. While many of these risk factors have been studied in some detail among gifted populations (e.g., Mueller, 2009; Neihart, 1999), an emerging body of research is exploring how media, technology and social media usage impact growth trajectories for adolescents (Lenhart, 2015) and for gifted adolescents (Housand & Housand, 2012), especially as it relates to overall health and well-being (Romer, Bagdasarov, & More, 2013).

According to Michikyan & Suárez-Orozco (2016), increasingly, teens are turning to evolving media and social media as ways to meet their needs for self-presentation and self-disclosure, and that these behaviors have been linked with key developmental tasks for adolescents—formation of an integrated identity (Erikson, 1964), formation of intimate relationships (Maher, Winston, & S, 2017; Mayseless, 1993), and overall general well-being (Best, Manktelow, & Taylor, 2014). As discussed in more detail later, these media actually may offer ways for gifted students to manage their feelings around depression or suicide, however, many times these same media be linked with negative outcomes, including depression and anxiety (Radovic, Gmelin, Stein, & Miller, 2017; Woods & Scott, 2016) and in some cases, suicidal ideation (Laffier, 2016).

In addition, the incidence of bullying and cyberbullying is also increasing among teens (Selkie, Fales, & Moreno, 2016), which in some cases does lead to depression and suicide (Bauman, Toomey, & Walker, 2013). Gifted students who are criticized or bullied online are

more at risk for emotional difficulties, according to Webb (2005), gifted students who are not in the proper educational environment are likely to be alienated by peers, including being called "geeks" and "nerds". Suicide attempts are more frequent among youths who are particularly creative and highly sensitive (Webb, Gore, Amend, & DeVries, 2007).

Depression and Suicide in Gifted Children and Adolescents

According to the American Psychological Association (1994), depression is a psychological state generally represented by feelings of sadness; and a sense of hopelessness, helplessness, and worthlessness; and does not discriminate according to gender, age, socioeconomic level, amount of education, or race/ethnicity. Symptoms of depression manifest across several developmental domains, including behavioral, cognitive, social, emotional, and physical (Jackson & Peterson, 2003). Figure 15.1 provides a graphical list of some examples of depression in each of these domains.

As evidenced here, symptoms of depression are often simultaneously present across areas of development. Furthermore, among gifted students, who often possess the capacity to compensate, these factors may contribute to the possibility that these symptoms go undetected or remain masked. According to the National Association for Gifted Children (NAGC) (2018), approximately 10% of gifted adolescents are seen each year for clinical symptoms of depression. One way of looking at the propensity for depression among students with gifts, is that because they demonstrate advanced development, have more sophisticated reasoning ability, and have a heightened awareness of their surroundings that they somehow have a protective coating that exempts them from stress that can lead to emotional distress (e.g., depression, anxiety, and suicidal ideation). Along this perspective gifted children and adolescents either do not get caught-up in the activities of daily life that are common place among developing preteens and teens; or they are more equipped to cope with the nuances persistent across all developing children and adolescents.

On the other hand, it might seem counterintuitive to think that individuals who excel academically and who demonstrate high levels of self-control, curiosity; and who are ambitious, goal-directed and have such an interest in learning

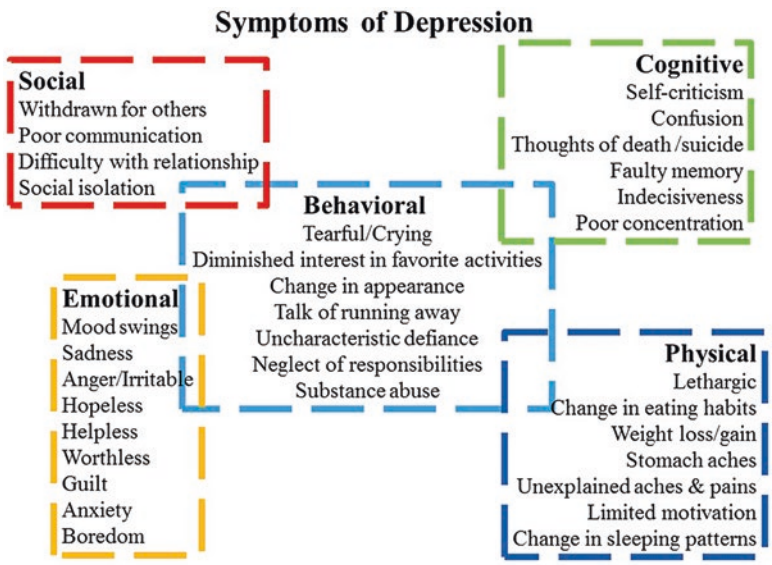

Fig. 15.1 General symptoms of depression by developmental domain

could actually be prone to feelings of depression (and suicide). However, the literature suggests that it is these very gifted characteristics that provide gifted students with amazing educational experiences that act as the catalysts for their social and emotional battles. For instance, they have higher than average tendencies toward perfectionism, therefore face challenges with more intensity and persistence; their higher aptitude potential often makes them struggle to see where and how they fit into their peer group; their heightened sensitivity makes them more emotionally vulnerable with stronger senses of awareness that foster self-doubt and self-criticism; there level of maturity prevents them from adequate coping skills that lead to relationship conflicts that in turn can cause them to be introverted and isolate themselves in all contexts (i.e., home, school, and peers). Gifted students have exceptional opportunities because of their aptitude and ability. These opportunities facilitate a unique view of the world; and can intensify intrapersonal, interpersonal, and contextual catalysts that gifted children and adolescents encounter. The consequences of giftedness can result in equal or above normal depressive symptoms that activate added pressure and stress on some gifted children and adolescents who have limited or poor coping skills that allow them to persevere effectively. An added problem is that parents, teachers, school counselors, and peers who interact with gifted children and adolescents are challenged to identify and/or aid these students in an appropriate manner.

There is a good amount of literature to support claims that depression in gifted children and adolescents is a cause for concern among parents (Cross, Gust-Brey, & Ball, 2002; Logan, Crosby, & Hamburger, 2011; Morawska & Sanders, 2008; Peterson, 2002; Wellisch, 2010) educators (Cross & Andersen, 2016; Jackson, 1998; Mueller & Haines, 2012; Preuss & Dubow, 2004), and counselors (Peterson, 2002; Peterson & Moon, 2008; Pfeiffer, 2012; Riedl-Cross & Cross, 2015) because they are (at least) a high risk population, if not at higher risk of depression due to their high ability, asynchronous development, and maladaptive social and emotional challenges (Neihart et al., 2002). It is conceivable that signs and symptoms of depression in gifted populations of children and adolescents are easier to go unnoticed, overlooked, misunderstood, mistreated, and even misdiagnosed; regardless the implications can sometimes be deadly (Bender, Anestis, Gordon, & Joiner, 2012; Klein & Wender, 1993; Missett, 2013; Riedl-Cross & Cross, 2015).

Peterson (2002) conducted a longitudinal study of post high school gifted students at risk of poor educational outcomes; and found that both male and female gifted individuals struggled with varying degrees of self-assessment, family issues, autonomy, commitment, conflict resolution, and career planning; all of which in their reflections started at a very young age. Although the population is inconsistent with our focus and the study was not targeting depressive symptoms, this study is relevant for two reasons. First, signs of depression were riddled throughout the qualitative data that was provided in the paper. It could be that the maturity level and life experiences allowed them to reflect and discuss their emotions. It could be that someone taking an interest in them gave them a platform to discuss their emotions. Second, it was apparent that the alignment of their giftedness and their depressive signs persisted into young adulthood where they continued to struggle; this seems like a foreshadowing and can inform how we can prevent and intervene with gifted children and adolescents in their earlier development.

On an intrapersonal level, young gifted girls experience increased levels of guilt, low self-esteem, and depression and somatic symptoms (indicator of depression) compared to boys (Silverman, 1993). Generally, across the literature girls feel more out of sync and out of control, they succumb to pressure and stress; falling into a stereotypical gender rabbit-hole of feelings of incompetence, self-doubt, ambiguity about their ability, low self-esteem, negative self-evaluation, and passivity. Girls receive more mixed messages from parents, teachers, and peers than their male counterparts; and generally feel more unhappy and tense. They report feeling more overwhelmed with the pressure of being female and gifted but tend to strongly value having a career and adult

responsibilities. Girls want to develop into kind, caring, and compassionate individuals; however, gifted females report that during childhood and adolescence they are in constant intrapersonal conflict with how to find autonomy. They discuss struggling with feelings of inadequacy and experiencing interpersonal pressure that comes with the expectations of those around them. Gifted girls demonstrate more outward signs of depression but according to Peterson's (2002) study they have better long-term rebound effects when they reach a level of maturity or gain experiences that prepare them to cope more effectively. So it is that preteen and teen girls struggle with developing their female identity, and it is the same for their male counterparts.

Gifted boys struggle with the same intrapersonal challenges negotiating their masculinity as girls do with their femininity; however, there is substantially less research conducted on gifted boys (Shepard, Foley-Nicpon, Haley, Lind, & Liu, 2011). According to Levy and Plucker (2003), boys frequently experience problems with depression, perfectionism, identity, navigating environment, and social relationships because they have the same asynchronous development as their female counterparts. Since gifted boys experience all of the typical gifted characteristics (e.g., heightened sensitivity and emotionality) which are in direct contrast to masculinity. Developmentally, gifted boys are likely to succumb to their perceptions of manliness and withdraw and cover up feelings of isolation, fear, and doubt (Hébert, 2002). However, academically boys are more likely to enter math and science fields so they have more opportunities to develop higher levels of confidence, self-esteem, and increased academic self-concept than girls (Preckel, Goetz, Pekrun, & Kleine, 2008). However, in terms of leadership boys might be less likely to participate in activities such as school governance because they are considered to be more feminine roles (Kerr, Preuss, & King, 2006). Despite the slight differences that young boys experience they are still prone to asynchronous development that can facilitate maladaptive gender and identity development that can and should raise awareness of the risk of depression. Shepard et al. (2011) found that boys struggle with their masculinity surfaces earlier that girls struggle with their femininity.

It is more often that depressive signs and symptoms in gifted students subside for a myriad of reasons; for instance, maturation, the immediate stress is alleviated, the individual acquires coping skills to manage the distress independently, or preventative measures are in place to provide a support system or resources to manage the symptoms. In other cases of depression symptoms require prevention and intervention which will be discussed shortly. In more sever instances of gifted child and adolescent depression, a real concern is the exacerbation of depression which can be very difficult to identify since gifted students have a tendency to turn inward, and alienate or isolate themselves. One major concern for these students is the potential their mortality because suicidal behavior is very commonly preempted by some warning signs and symptoms associated with depression, in which symptoms of depression are either persistent or consistent or exacerbated (Bender et al., 2012; Ferguson, 1983).

Theories of Suicide

The act of suicide actually occurs in isolation or as a result of isolation and alienation; but the process of getting to the point of suicidal thinking or acting on the ideations evolves. However, how it evolves is associated with several theories of suicide. We have framed our perspective using the person–environment fit theory and the differentiated model of giftedness and talent (DMGT) to discuss how risk factors apply to gifted children and adolescents. Vulnerabilities and being out of sync place gifted children and adolescents on a direct path to depression and suicidal behaviors. This section will review some of the theories of suicide that capture gifted characteristics and development; and contextual experiences; as well as, discuss the juxtaposition that exists between risk factors and resiliency in gifted children and adolescents. In one way or another these

Psychological, Sociological, Interpersonal, and Existential Theories assist in explaining how gifted children and adolescents experience internal/external stress, and require sufficient coping mechanisms to escape struggling with depression or suicidal behaviors. Additionally, they assist in identifying prevention and intervention resources that can capitalize on the protective factors of gifted children and adolescents.

Psychological Theories of Suicide

There are psychological theories of suicide that emerge due to intrapsychic imbalance (i.e., self/intrapersonal) caused by overwhelming psychological stress that is brought on by one's self, relationship with others (i.e., interpersonal), or interaction with their environment (i.e., contextual). Using the person–environment fit theory applied to the differentiated model of giftedness and talent, while taking into consideration the complexities of asynchronous development we view these psychological theories as foundations for an Integrated Model of Gifted Depression and Suicide. In this view, psychological theories of suicide are one pillar in the complexities of depression and suicide. We next turn our attention to discussion on three psychological theories of suicide: development, hopelessness, and psychache.

Developmental. Suicide is dynamic and multidimensional versus static and descriptive (Maris, Berman, & Silverman, 2000). A developmental perspective of suicide assumes that individuals go through developmental life stages; each stage having specific milestones. At each stage as an individual grows and progresses; likewise their interactions with others and their environment continually changes. When an individual is unable and ill-prepared to cope with the changes that occur within their trajectory they can become depressed and view suicide as a palpable option. For example, in our education system (contextually) an individual changes schools on the average of 4–5 times in a P-12 career (i.e., preschool, elementary, middle, secondary or junior high, and high school). The context changes, the teachers and friends change, individuals change interests so groups may change all the while the individual him or herself is experiencing cognitive, emotional, social, and physical changes.

According to Erikson (1964), if an individual is incapable or cannot navigate all of the developmental changes they begin to form maladaptive behaviors such as mistrust, guilt, shame, and isolation; and interestingly enough these same maladaptive behaviors are characterized repeatedly across all of the gifted literature (Cross & Andersen, 2016; Jackson & Peterson, 2003; Mueller, 2009; Olszewski-Kubilius, 2002; Pfeiffer & Stocking, 2000; Preuss & Dubow, 2004; Rollins & Cross, 2014; Wellisch, 2010). The dimensionality of understanding suicide from a development perspective is comprehensive and includes most or all of the following: (a) parental/sibling history of depression/suicide; maladaptive coping behaviors; (b) the individual's social development (e.g., social support or social isolation patterns); (c) cultural and historical of political climate (e.g., pre-911 or post-911); (d) the economic climate they are exposed to (e.g., the Great Depression, collapse of the stock market); (e) biological dispositions, physical health, and well-being; (f) values and beliefs; and (g) patterns of emotional maturity, coping, and maladaptive behavior.

Hopelessness. Beck (1979) presented a cognitive triad in which there is a negative alignment about one's self, their environment, and the future. According to Abrahamson et al. (2000) suicidal individuals often perceive situations in a predominantly negative manner. For instance, they strive for, need, and desire a particular outcome; but according to the hopelessness theory, they view the outcome as unattainable or improbable because they are ill-prepared to accomplish the goal or their social network does not provide the necessary supports for success. The individual begins to focus on adverse consequences and believes there is nothing they can do to attain the goal. Their hopelessness turns to despair and they turn to death as a solution.

Psychache. Psychache is a psychological theory of suicide that evolved from Shneidman's (1987) cubic model. Shneidman (1993) identified psychache as the mental soreness, ache, pain, hurt, and anguish that an individual experiences in their mind or psyche. Much like the theory of hopelessness, Shneidman (2001) tied psychache to feelings of torment and hopelessness derived from cognitive and affective intolerances, in which an individual becomes disturbed and intolerant of the constant mental pain as the pressure and stress continues to stack-up. Suicide emerges as an individual views death as a solution to the insufferable pain that is called psychache. Cross (2013) and Cross and Cross (2018) suggest that psychache and hopelessness are ideal theories for understanding students who are in distress and the lived experiences of suicidal behaviors. Additionally, very similar to the theory of hopelessness, psychache breaks down protective factors such as; sense of self and industry, social supports, uses of agency; and makes it possible to succumb to risk factors.

Sociological Theories of Suicide

In thinking of theories of suicide as pillars that can be mapped onto our notion of person–environment fit theory and DMGT as a way to address depression and suicide in gifted children and adolescents; the second pillar consists of sociological theories of suicide. A Sociological perspectives focus on the "environment" and the social interaction that an individual has with members of a particular environment. For example, at home children and adolescents interact with their parents, their siblings, maybe extended family, neighbors, the family pet; and sometimes their peers. Another example of environment is school; an individual interacts with many different teachers, staff, administrators, and peers. Maybe an individual interacts differently with their peers in their home environment versus at school; and maybe a student interacts differently with their Math teacher versus their English teacher. A sociological view considers how different groups of people can interpret exact events in dissimilar ways or how social norms change the way the same person might interact differently based on others and the environment. We will discuss two sociological theories: Durkeim's social integration theory and Suicide Trajectory Model. We think that both of these theories of suicide speak to many of the challenges experienced by gifted children and adolescents that increase their vulnerability to depression and suicide; and can enhance protective factors.

Durkeim's Social Integration. In Durkheim's (1951) approach, individuals are connected socially through activity within a social group or network. Our relationship with the group could be by choice or convenience or by chance, regardless of the nature of the connection we are bound to particular social groups. Therefore, Durkheim's theory is twofold; social integration and social regulation. Social integration addresses the nature of our connection to a certain social group; and social regulation addresses how our needs and emotions are driven by the culture of the group (e.g., norms and customs).

In Durkheim's Social Integration approach there are four types of suicide: (1) Egoistic, occurs when an individual fails to integrate or identify with their social group; (2) Anomic, occurs due to a disruption of social norms within a group, this disconnect can be real or perceived; (3) Altruistic, results from social enmeshment with a group such that an individual loses their autonomy; and (4) Fatalistic, results from hopelessness in which and individual can see no way out.

Suicide Trajectory Model. Stillion and McDowell's (1996) Suicide Trajectory Model encompasses all of the risk factors that lead to depression and subsequently if gone undetected and untreated result in suicidality. We are talking the gamut; biological, psychological, cognitive, social, and environmental factors that promote poor or weakening coping skills, maladaptive behaviors, illogical reasoning; the more these risk factors mount, the higher the individual's vulnerability to suicide becomes over time.

Interpersonal Theory of Suicide

Joiner (2005) introduced interpersonal theory of suicide; it is a straightforward approach to understanding suicide. Joiner (2005) and Joiner, Van Orden, Witte, and Rudd (2009) suggest that an individual will eventually evolve to suicide if two psychological states are experienced by an individual at the same time and for some extended duration. Specifically, the suicidal individual perceives that they are a burden (i.e., perceived burdensomeness) and lack any sense of belonging (e.g., social isolation). So over time a depressed individual begins a process of becoming capable of committing suicide by building a tolerance (so to speak) of dying in which they do not fear death, injury, or pain. A person might begin inflicting self-injury repeatedly or getting into physical altercations or even placing themselves in harm's way to experience accidental injury so they in a sense become familiar or habituated to the pain. Another way to build a tolerance to the fear of death and pain is vicariously by exposure to others' death, pain, or suffering. For instance, a war veteran or an emergency room doctor might acquire higher tolerances for pain and suffering by being a repeated witness to others' experiences. At the time an individual decides to kill themselves; according to Joiner et al. (2009) all three components must be aligned for suicide to occur; burdensomeness, lack of belonging, and capability.

Existential–Constructivist Framework

This framework is two-sided, consisting of Yalom's (1980) theory of existence (i.e., death, existential isolation, meaninglessness, and freedom); and a constructivist mindset in which an individual constructs their view of self and other relationships. Further, in this framework, the individual is faced with environmental challenges that require action. Suicide becomes a viable option when an individual rejects the idea of maintaining an existing view (i.e., existing construction) and rejects the notion of constructing a new or different view because events or risk factors become too overwhelming to cope with, making it possible to elect not to view self and other relationships in the world (Rogers, Bromley, McNally, & Lester, 2007).

Gifted children and adolescents have the cognitive capacity to negotiate philosophical dilemmas such as life and death; and they possess the intensity to contemplate such topics in terms of depth and duration. On the down side, gifted students might also have a maladaptive tendency for asynchronous social and emotional development that limits their ability to have trusted role models (mentors), as well as limited coping ability that might lead to suicide as a reasonable solution to alleviate the cognitive dissonance. Gifted individuals are generally highly intellectual, sensitive, and rigidly idealistic who have lower tolerance for their own perceived imperfections; and others' behavioral or moral inconsistencies.

Suicide

The majority of the recent literature across research fields (e.g., medical, mental health, education, and counseling) follows the CDC's definition of suicidal behavior (for more detailed description, see CDC; Crosby, Ortega, & Melanson, 2011; Cross & Cross, 2018). Suicide is identified as behavior that results in death that is intended to end one's life and is self-inflicted. Suicide attempt is identified as behavior that does not result in death in which an individual may or may not incur injury; and is self-inflicted with intent to end one's life. Suicidal ideation is guided more by thinking about or contemplating suicide or having a plan; rather than behaviorally acting on it.

Suicide is serious at any age and among all populations however, some literature is more readily available; for example, age (e.g., age and gender) and cause of death (e.g., suicide) while other information is simply not collected (e.g., gifted students; Cassady & Cross, 2006; Cross, 1996; Cross & Andersen, 2016). Therefore, Table 15.1 was created based on reports published by the Center for Disease Control and Prevention from 2006–2015 as a way to gain

Table 15.1 CDC 2006–2015 cause of suicide by age and gender

	Overall rank cause	Age 10–14	% Male 10–14		% Female 10–14		Overall rank cause	Age 15–24	% Male 15–19		% Female 15–19	
2006	4	215	7.3		4.9[a]	6	3	4189	12.7		7.7	
2007	4	180	6.2		3.3[a]	6	3	4140	12.8		7.4[a]	2
2008	3	215	7.9		5.2[a]	5	3	4298	14.3		9.3[a]	2
2009	3	259	9.2		6.9		3	4371	16.2		10.3[a]	2
2010	3	267	10.4		7.1		3	4600	16.8		11.1[a]	2
2011	3	282	11.0		7.4[a]	4	2	4822	18.8[a]	3	12.4	
2012	3	306	12.9		7.4		2	4872	19.0[a]	3	14.4	
2013	3	386	14.5[a]	2	11.6		2	4878	20.0		14.6	
2014	2	425	15.5		13.4[a]	3	2	5079	20.6		15.6	
2015	3	409	NA		NA		2	5491	NA		NA	

[a]Indicates *rank cause* discrepancy by gender. Split cells represent the adjusted rank per age/gender

some perspective about the number of instances; and the rate that suicide might be impacting gifted children and adolescents who make up a piece of the statistics. Keep in mind that these statistics are likely modest because often an intended suicide is not ruled as a suicide when a medical examiner cannot be sure or due to a variety of emotional, political, or religious variables (Granello & Granello, 2007).

In 2006, at the American Psychological Association's Annual Convention a panel of experts discussed suicide among preteens and teens; most notably the rise in suicide among children age 12 and under based on the 2006 report from the National Center for Injury Prevention and Control (NCIPC), which identified 56 preadolescent suicides in the United States. However, when you compare this statistic to reports by the CDC, we are really talking about a pretty specific preadolescent group from age 10 to 12; because the CDC has not reported suicide as a cause of the death in the 5-to-9-year-old category. Further, it is preadolescent boys who successfully commit suicide as compared to their female counterparts. For example, in the 2006 NCIPC reported of the 56 preteen suicides there were 45 boys and 11 girls. The most recent data from the CDC and the NCIPC continues to show an increasing trend in child and adolescent suicide, with girls attempting suicide at higher rates but with boys being more successful.

Table 15.1 shows that, in children age 10–14 the number of suicides nearly doubled between 2006 and 2014 (215 versus 425 instances of suicide); and that the suicide rate among teens between ages 15–19 is *probably* in the neighborhood of ten times that of their younger peers. For example, in 2015 the CDC reported 409 children ages 10–14 committed suicide and 5491 adolescences/young adults between 15 and 24 took their own lives. The emphasis on "probably" is because when the CDC reports overall cause of death (e.g., suicide), the age range is 15–24 years old as compared to how they report the gender specific cause of death which is 15–19 years old (see Table 15.1).

It is worth noting too, that the ranking for the cause of death changes slightly when you consider gender (see Table 15.1). For males, suicide as a cause of death is consistently ranked (i.e., overall and gender-specific) across the younger and older groups. According to the CDC reports and Cross (2013), the higher success rate in boys could be because their preferred means of suicide are firearms which are easily acquired and inflict more terminal consequences; whereas, girls choose overdose or poisoning which allows time for medical intervention to prevent eventual death.

Conversely, when considering the trends across the female groups we see three definitive shifts that should put parents and professionals on high alert. First, in the younger group (10–14) in 2006, the suicide rate was 4.9% and suicide

was the sixth cause of death but by 2013 the suicide rate increased to 13.4% and became the second cause of death. This illustrates how suicide as a cause of death in 10- to 14-year-old girls has nearly tripled. Second, between 2006 and 2008 when comparing the younger and older groups of females, suicide as a cause of death seemed to rank lower in the 10–14 age group in which it was the sixth cause of death compared to their older peers during the same years where suicide was the second cause of death. This illustrates how girls begin to view suicide as a viable option as they develop from preteen to teenager. Third, the percent of younger girls in terms of suicide as a cause of death is steadily increasing more rapidly than their male counterparts; in 2006 the difference between percentage of suicide in boys and girls was 2.4; however, in 2014 it is 2.1; this demonstrates that the younger girls are catching up to the younger boys; as opposed to the older group of boys and girls in which suicide as a cause of death is increasing at about the same rate. This should give us reason to pause and consider children and preteens (10–14) very seriously despite the considerable contrast in instances of suicide in the older age group due to the 10- to 14-year-olds nearly doubling the cases of suicide and noticing that the increased trajectory is progressing more rapidly than older adolescents.

It goes without question that gifted children and adolescents are a unique and complex population; and yes vulnerable to depression and suicide. Here again, there is no empirical evidence to indicate that gifted students are more or less prone to suicidal ideas or risk of suicide (Cross & Cross, 2018; Nicpon & Pfeiffer, 2011). According to the NAGC of the 10% of gifted adolescents who are seen for clinical symptoms of depression, the rate of suicide tends to be higher in those who are more sensitive, artistically creative, and attend competitive schools. Otherwise, we encounter very similar obscurities that exist in the literature when comparing gifted students and nongifted students; however, it is important to note that it is because this type of data is not collected and not because there are not documented cases of gifted student experiences with depression and suicide (Cross, 2002).

In a psychological autopsy case study, Hyatt (2010) identified some themes from an 18-year-old female who committed suicide. All of the themes are consistent (with varying degrees) with both young gifted boys and girls who are seen for depression and have attempted suicide. For example, instances of being bullied, feelings of rejection and being misunderstood, and thoughts of suicide as a solution for their need to be perfect and a genuine mistrust of adults. There are two salient aspects of this study that resonate across much of the research with gifted children and adolescent depression and suicide. First, the duration of the painful intrapersonal turmoil that is experienced (i.e., suicidal ideation). For instance, Hyatt (2010) writes the young girls words, "I've strongly considered it since 5th GRADE!!! I'm obviously serious." Second, the sophistication and integration of ruminating thoughts and emotion that far exceed most child and adolescent cognition. Hyatt (2010) discusses some of the topics captured in poems and reflective writing that include; thinking and worrying about people who are hungry and her desire to help; as well as some characteristic issues such as her mother's safety and a desire to be rich and famous. At age 10, she wrote about topics that are quite uncharacteristically complex; for instance, feeling so detached that she thought she might be insane and die from the illness. Joiner (2005) talks about how suicidal individuals become habituated to the ideas of death in which the fear becomes comfort by physical or psychological familiarity to the pain. This is consistent with Hyatt's (2010) case, in which she begins to personify a dying tree and what the experience might be like if she was the tree. Third and alarming at many levels, is the overall mistrust of adults (Hyatt, 2010). Depressed and suicidal children and teens have very covert ways of demonstrating depression and suicidal ideations; they more readily make this information available to their peers who do not disclose such information. In Hyatt's (2010) case a friend of the suicide victim confides to the victim's mother 2 weeks after her death that she knew of the girls plan. This same victim refused

help from counselors (again still referencing 5th grade) because counselors tend concentrate on what is wrong with the individual; she spoke of teachers as "rigid authoritarians" and felt she would be silenced. Further, more in-depth perspectives regarding adults centered on issues of conforming to adult perspectives and that adults are not invested in innovation or originality. Hyatt (2010) conveys a time in which the girl wrote in an assignment thoughts of suicide; and when the paper was returned the teacher had simply placed a check mark on it to represent the completion of the assignment. In her reflection the suicidal teen's impression of adultways (i.e., rigidity, silencing, and lack of investment) is vented because the teacher had not so much as acknowledged her pain.

Integrated Model of Gifted Depression and Suicide in Children and Adolescents

The inability to cope effectively can manifest in ways that can be explained through a more complex integrated perspective using person–environment fit theory and DMGT that mirrors the complexity of a gifted student. In Fig. 15.1, we propose a conceptual model that gifted children and adolescents are impacted in three discrete but integrated ways: intrapersonal (relationship with self), interpersonal (relationship with others; e.g., teachers, parents, and peers), and contextual (relationship with the environment; e.g., home and school) disequilibrium. The model is intended to demonstrate the complexity of relationships and the dynamic nature of perpetual movement and change.

Within each of these types of relationships are protective factors and risk factors (see King & Merchant, 2008). Protective factors are characteristics or dispositions such as resourcefulness, skill level, support structure, and the effectiveness of coping ability that an individual has within themselves, and others. Additionally, protective factors cut across multiple contexts (home, school, and extended community) that provide some level of developmental insurance that an individual will be able to manage and cope with stressful life events in a developmentally productive, effective, and efficient manner. Ideally, the protective factors should aid in reducing or diminishing one's risk factors. Risk factors are characteristics or dispositions that can impose specific challenges or obstacles that threaten a healthy trajectory of development. Everyone has protective factors and risk factors but in thinking of protective factors and risk factors among gifted children and adolescents, we propose, might involve a different type of process. They certainly have several protective factors (see Table 15.2); particularly in the cognitive domain (e.g., high reasoning ability and problem-solving or tendencies toward curiosity and exploration); however, it is these very cognitive-rich traits that can lead gifted individuals to encounter asynchronous development in other developmental domains that are catalysts for depression and suicidal thoughts and behaviors. The *Integrated Model of Gifted Depression and Suicide* (Fig. 15.2) demonstrates how risk factors experienced by gifted students pose imminent cause for concern about tendencies toward depression and suicidal behaviors because of the unique stress, ineffective coping, maladaptive adjustment, and asynchronous development in which cognitive ability exceeds their emotional and social maturity. This contextually embedded perspective applies developmental process and the challenges unique to gifted students.

We will offer some thoughts and suggestions for parents and professionals of gifted children and adolescents that might make students who are at risk of depression and suicidal behaviors more readily identifiable; and then make recommendations that capitalize on gifted student protective factors initially by using person–environment fit; and later suggestions for preventative strategies and intervention protocols. Figure 15.3 is a more practical application of the conceptual integrated model of gifted depression and suicide that demonstrates the process and how coping strategies and environmental supports can effectively address the needs of gifted children and adolescents.

Table 15.2 Gifted characteristics applied developmentally to person–environment fit

Gifted developmental process and protective catalyst applied to giftedness			
P-E fit Development	Intrapersonal Relationship w/ Self	Interpersonal Relationship with Others	Contextual Relationship with environment
Behavioral	Advanced developmental performance (e.g., artistic, athletic, music, intellectual) Strive for perfection	Bored and impatient with conventional teaching approaches Difficulty with peers	Bored and impatient with standard educational settings Driven to explore and understand their environment
Cognitive	High capacity for effortless learning Intense motivation to explore big ideas/problems in depth Interest in philosophical & social issues Logical/Intuitive/Curious Reasoning, Abstraction, Conceptualization, and Synthesis	Vulnerable to perceived peer rejection of thoughts and ideas	Understand and integrate inanimate objects Sophisticated sense of beauty in the world
Social	Need to be alone Introverted/Isolation Independent	Restlessness in groups Adult mistrust Lack compromise skills	Require order/structure Intolerant to physical obstacles and proximity to others
Emotional	Over excitability Overly passionate Self-criticism	Emotional insight toward the other personalities Empathy for pain and suffering of others Sensitive to peer rejection Take criticism personally Feel others stress	Interest in and bonding with the physical world
Physical	Intense allergic responses Difficulty sleeping	Psychomotor agitation (e.g., rapid speech and nervousness)	Aesthetic sensitivity (e.g., color, rhythm, form, space) Physical sensitivity (e.g., light, sound, food, fabric, and temperature)

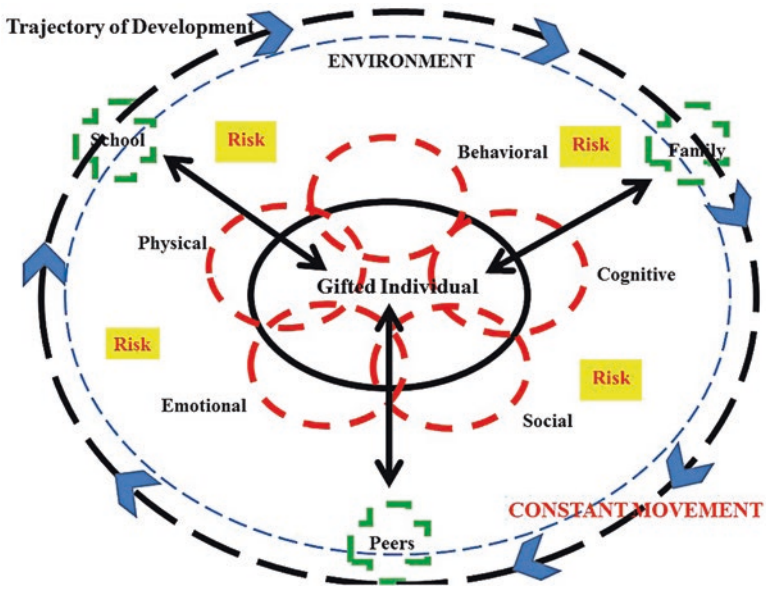

Fig. 15.2 Trajectory of an integrated model of gifted depression and suicide

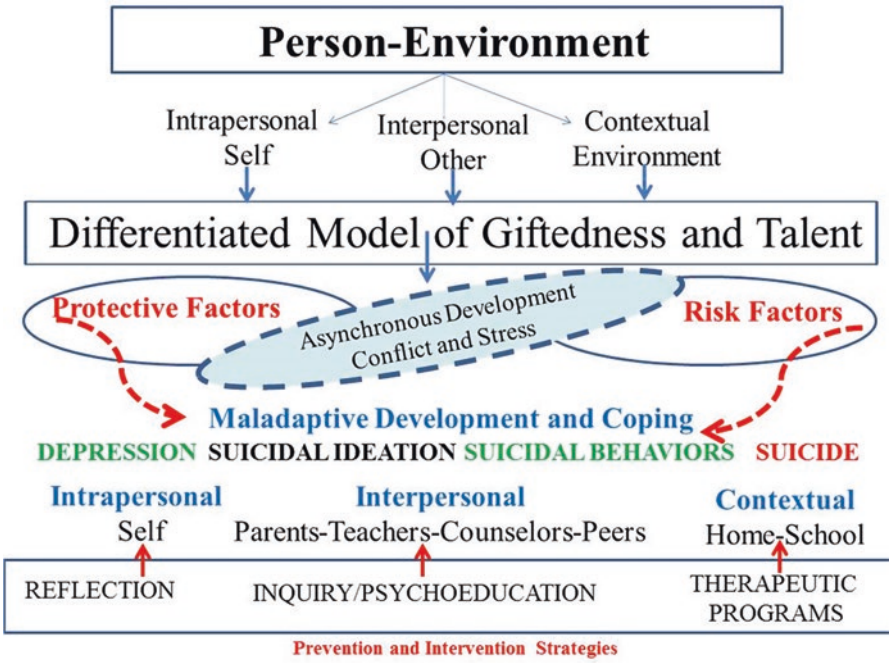

Fig. 15.3 Practical application of the integrated model for practice

Intrapersonal Protective and Risk Indicators

There are specific reasons why gifted children and adolescents can become depressed and/or experience suicidal ideations or suicidal behaviors that are different from their academically average counterparts. Although all children and adolescents develop an internal relationship that they have with themselves, and through the development of a relationship with one's self are a certain amount of protective factors and risk factors, those that are experienced by gifted children and adolescents are slightly unique. In this section, we discuss intrapersonal protective characteristics and the corresponding risk factors. In Fig. 15.3, we show a disconnect between protective and risk factors that can cause a push-pull (i.e., nondichotomous). Another way to say this is that there is a reciprocal and ongoing struggle in which the protective factors facilitate the risk factors and vice versa; and lead to increased intrapersonal stress and conflict which in terms can promote asynchronous development. On an intrapersonal level (refer to Table 15.2) gifted students demonstrate high ability and strive for perfection in all that they accomplish and can regulate their behavior which makes them appear to have equally high maturity levels (i.e., an adult perception of high maturity). In terms of development we see the same high standards that they hold for themselves in terms of cognitive ability (e.g., things come easier to them, they are self-driven, they are logical, intuitive, and curious, and they are familiar with higher-order thinking and problem-solving). There can be self-imposed pressure to excel because they perceive pressure from parents and teachers to over perform consistently; and in all areas. This high cognitive ability and performance may be seemingly providing protective resourcefulness. However, when considering development, this is a misinterpretation since this places the gifted student in a direct path for developmental imbalance. They have greater than average cognitive and behavioral ability but this can create social risk factors because they view themselves as different from their nongifted peers. Being different

gives a gifted student a sense of insecurity and self-doubt that makes them search for where and how they fit-in with their peers (especially their nongifted peers). This awkwardness can prompt them to isolate themselves; and given their preferences for solitude and independent work they can appear to their peers to be unapproachable or unrelatable so the alienation grows and so does the potential risk of depression or suicidal behaviors. Likewise, the emotional characteristics of gifted children and adolescents are in contrast to their peers, because despite adult perception of or expectation of maturity, peers observe gifted students as overly excitable about learning and ostracize them from peer-groups because they are weird for liking school and view them as immature. The constant reflection that gifted students experience about fitting in and social struggles can foster self-criticism. They do not evaluate themselves fairly and are easily placed at risk or are prone to being bullied by their peers at school and by their siblings at home. Additionally, there are physical characteristics that can place gifted students at risk. For instance, they have heightened sensitivities to the environment that can cause allergies, rashes, and illnesses; and they have difficulty sleeping. These physical implications further promote some of the same self-critical and isolative risk factors. The self-criticism, increased time spent in isolation, feeling of being an outcast can work cooperatively with the high cognitive ability to internalize feelings of depression, suicidal ideations or suicidal behaviors. These are consistent with the theories of suicide reviewed briefly in an earlier section. High cognitive ability poses challenges in gifted children and adolescents' development of self that can be addressed by parents, teachers, and counselors.

Developmentally appropriate intrapersonal needs. Parents, teachers, and counselors should try to identify feelings of guilt, low self-esteem, self-doubt, learned helplessness, and cognitive struggles and changes in concentration, attention, and memory. Focus should be on the student's strengths; reason about the positive aspects of being gifted, and set realistic goals. Gifted students respond well to higher-order strategies such as mindfulness, self-assessment, and relaxation because these are areas that they excel. Bibliotherapy interventions involve providing students with reading materials like books in which the characters encounter similar challenges. Gifted students can develop an awareness that others have similar struggles and develop coping mechanisms vicariously.

Interpersonal Protective and Risk Indicators

Positive social relationships can be effective tools for avoiding depressive symptoms that can lead to suicidal behaviors (Baumeister & Leary, 1995). Finding friends and developing rich and meaningful relationships with others that meet their high need for stimulation is particularly challenging for gifted children and adolescents, so that they are at higher than normal risk of social isolation and alienation. Again, referring to Table 15.2, the protective-risk factor trap is more apparent when thinking about gifted children's and adolescents' vulnerabilities to feelings of depression and suicide. They can become bored and impatient with others; in particular, teaching approaches that do not accommodate their cognitive inquisitive nature and need for perfectionism. As noticeable in the intrapersonal struggles, it is apparent that when considering the interpersonal relationships the apparent vulnerabilities in developing peer relationships is a high developmental need and a high risk factor for gifted students pretty much across the board. They are restless and uncomfortable in groups, they mistrust adults (especially parents, teachers, and counselors), and can be perceived as inflexible, uncompromising, and needing extensive explanations to be satisfied (Hyatt, 2010). Therefore, relationships with parents, teachers, and counselors can often be characterized as conflictual, critical, and judgmental. Despite the interpersonal challenges at a time when social relationships and supports are so critical, gifted children and adolescents continue to feel a great deal of compassion and empathy for others, especially those who are in pain or

suffering. The problem with this is that their heightened emotional sensitivity for others does not result in a close connection to others that can foster developmental balance with interpersonal behavioral, cognitive, social, emotional, or physical domains. Relationship with others is accompanied by added pressure and stress for academic achievement and persistent peer rejection. Developmentally, this is a time when relationships with others are important for developmental support, role modeling, building meaningful interaction that can scaffold coping skills and problem-solving strategies (Cross, 2012). Relationships with others (particularly peer relationships) promote opportunities to better understand developmental challenges and have a shared sense of comradery that older children begin to need and adolescents definitely need to continue on a healthy social developmental trajectory. Relationships with adults during this developmental period can act as guidance and evaluation for potential vulnerabilities. The juxtaposition that occurs at an interpersonal level in gifted children and adolescents is potentially problematic given the high cognitive ability and asynchronous development in other domains. The lack of interpersonal connection and the lack of quality interpersonal interactions threaten a gifted student's ability to learn how to appropriately see how they fit in, rarely are able to get help from others, and can exacerbate intrapersonal stress, criticism, and doubt (Webb et al., 2007). So in this way we see there is a push-pull between the protective factors and the risk factor again with interpersonal relationships but we also begin to notice the reciprocal connection that occurs between intrapersonal and intrapersonal relationships. It is this within relationship development and between relationships development that might place gifted students at even more jeopardy of depression and suicidal behaviors because of it spins a web (so to speak) that gradually eliminates the ability to acquire coping mechanisms and support networks.

Developmentally appropriate interpersonal needs. Interpersonal weaknesses are more readily available because of the observable indicators such as boredom, limited or awkward interactions with peers, signs of rigidity or inflexibility when working with others, overt display of oversensitivity, and talk of outside pressure. It is important to encourage involvement in groups in which the child or adolescent has an interest and can engage with peers that have similar cognitive and intellectual abilities. An area that can inadvertently aid gifted students is for the parents of the student to seek out mutual support. One of the key contributors to gifted student challenge is their adverse response to outside pressure and stress brought on my parents and families. Parents and families need support from others who experience many of the same challenges. Gifted students can also benefit from a strong line of communication between parents and educator that includes proactive plans about the asynchronous development.

Environmental Indicators

Social and emotional maladjustment is compounded when gifted children and adolescents do not have supportive home environments or are academically mismatched. Specific challenges present themselves to gifted individuals when they view obstacles within themselves as in the intrapersonal traits discussed earlier but also if they perceive the environment to be unsatisfactory to meet their needs (Swanson & Woitke, 1997). According to Riedl-Cross and Cross (2015), when the environment is not compatible with the needs of gifted students exceptional intellectual needs and responsive to their social and emotional needs depression can result. Gifted students are more prone to boredom; therefore, they have to be accommodated so that boredom is avoided or they must have the intrapersonal resources to manage the boredom. Changing classroom environments or activities or adapting and self-regulating one's own behavior has been effective strategies in dealing with gifted student boredom (Coleman, Guo, & Dabbs, 2007).

Developmentally appropriate environmental needs. One of the main concerns is the misalignment of a gifted student and their home and classroom environment, it is essential that the environment is compatible with the student's strengths and weaknesses. Therefore, parents and teacher communication is essential for staying abreast of the alignment. Parents and teachers need to communicate about the student performance and behavior to identify the early indicators that something is amiss. Parents should be familiar with the classroom curriculum and the teacher's method and style in the classroom. When there is reciprocal interaction between the teacher and parents there tends to be is more realistic and appropriate expectations for academic performance and behavior.

Prevention and Intervention

There is an agreement that gifted children and adolescents are a misunderstood population and are vulnerable to depression and suicide which can often be unnoticed, overlooked, and misguided. According to Pfeiffer (2012), gifted students experience typical developmental challenges albeit in an asynchronous manner. According to Peterson and Moon (2008) younger gifted children are more likely to be accelerated in their social and emotional development for their age, whereas preteens and adolescents tend to be more delayed with their social and emotional development given their developmental expectation. For example, younger children spend more time in the safety of their home and have less exposure to social environments, they have far less experience with academic pressure to excel and do not perceive their giftedness as burdensome so they mature socially and emotionally congruent to or slightly ahead of their peers. Conversely, preteen and teen's experiences are much more complex socially, emotionally, and academically; the Band-Aid is quickly gone, but the maturity level and coping ability does not keep up with the rapid fire of the awkwardness. The shift in social and emotional development of gifted students between childhood and adolescents is likely because of the persistent escalation of their gifted characteristics and the social and environmental stressors. In gifted adolescents, the persistence of heightened sensitivity, social isolation, advanced curiosity, and aptitude begin to pull them away from others and their environment which makes the gap in their social and emotional development that much more apparent and salient; and create a skill-deficit in their ability to cope within their environment. The accelerated rate of development in conjunction with the unique characteristics of gifted children and adolescents can generate a host of social and emotional difficulties; this does not happen to all gifted students but it can lead to depression and suicidal behavior.

Although there is no evidence-based research on success rates of prevention and intervention of gifted depression and suicide, there is some question about the use of best practices or trends in addressing the social and emotional needs and disparities of gifted students (Mendaglio & Peterson, 2007; Moon, 2003; Peterson & Moon, 2008). Pfeiffer (2012) provides a basic but applicable way of thinking about how to counsel gifted students that we think applies to formal (e.g., counseling and therapy) and informal (e.g., parents and teachers). We have adapted his perspective slightly to align with the our DMGT and P-E fit perspective: (1) know your gifted student's characteristics including their protective and risk factors; (2) have a high level of developmentally appropriate gifted expertise; (3) know your gifted student's home and school environment; and (4) be flexible in your ability to work with gifted student's as it is not a one-size-fits-all approach, use the best practice for the presenting issue. There is one additional practice we would recommend when working with gifted children and adolescents; (5) include the family whenever possible. This seems like a particularly important intrapersonal developmental need for promoting autonomy and self-efficacy. Additionally, parents typically need the psychoeducation and support too. Recall from earlier discussion that a major source of stress and conflict among young gifted adults (when reflecting on their childhood and adolescents) was family conflict that persisted

into young adulthood. In terms of interpersonal relationship building there are immediate and long-term implications for strengthening family as a supportive resource as opposed to a constant and persistent source of stress.

This section is dedicated to helping parents and families, teachers, counselors, and other educational professionals; and peers to appropriately identify gifted children and adolescents who are at risk of depression and suicidal behaviors; and we provide some thoughtful tools to address the student's developmental needs.

Developmental Challenges

The developmental challenges and asynchronous development of gifted children and adolescents is cause for action on the part of parent, teachers, and school counselors. Gifted students can be challenging or misleading because of the young age or their high verbal ability. There are several considerations to take into account as a means of identifying gifted students who are at risk of depression and suicidal behaviors. Attacking the risk factors and promoting the resiliency factors can tap into the high cognitive abilities and incorporate healthy social and emotional development among gifted children and adolescents. In terms of promoting psychological well-being, it is important to place a strong emphasis on goals and goal-setting approaches to ensure well-being (Perrone, Civiletto, Webb, & Fitch, 2004); and this type of focus has been successful with gifted students (Gust-Brey & Cross, 1999; Preuss & Dubow, 2004). Some of the approaches that are effective at promoting resiliency are use of inquiry, psychoeducation, career counseling, bibliotherapy, and group counseling.

Having strong support systems can make identifying gifted students more efficient, this includes; parents, teachers, counselors, and peers. Tailored inquiry can help discern typical development from atypical development, particularly in the social and emotional domains. It is imperative to be knowledgeable about the nature of a student's relationship with; family (i.e., parents, siblings, and extended family), teachers, counselors, and friends. Langley (1998) explains that interpersonal relationships need to be authentic, mutually reciprocated, and respectful. Intrapersonal gifted characteristics can make building interpersonal relationships challenging but knowing about their heightened sensitivities, moral engagement, and their need for cognition can make facilitating social awareness can be mutually beneficial.

There might be confusion across nonclinical professionals, that addressing symptoms of depression and suicide need to be approached in a clinical/therapeutic context. However, there are some basic goal-directed approaches that can occur outside of a therapeutic environment; for instance, this idea of fostering interpersonal relationships as a means of avoiding depressive symptomology. Using Carl Roger's ideas about unconditional positive regard could be useful since it addresses the intrapersonal need for acceptance of thoughts without judgment and the interpersonal support of others whether it is a parent, teacher, or counselor. Given that gifted students have high ability inductive and deductive reasoning; and an intuitive sense about others relationship building is imperative. According to Pfeiffer (2012), some noticeable therapeutic relationship changes can occur when adequate attention is given to the individual's needs. In particular, the need for adult mentoring and identifying useful resources outside the family system that could meet social and emotional needs; and intellectual capacity. Now, not to minimize the need for therapeutic interventions but in the spirit of being proactive in addressing the unique developmentally appropriate needs of gifted children and adolescents as a means of moving them away from risk factors, mentoring seems like a viable and plausible goal for parents and teachers well before a need for counseling or therapeutic intervention is necessary. The important message from Pfeiffer (2012) is that the therapeutic relationship shifted from hierarchical to collaborative to more student-lead in which the content of the interaction included information that stimulated

the students' intellectual level and need for cognition, as well as developmentally appropriate intrapersonal goals (e.g., self-efficacy and fair self-assessment).

Learning skills to improve conflict resolution, problem-solving, how to handle disputes with others. Teaching communications skills and explicitly discussing the purpose and need for social interaction seems too easy but can be highly positive since gifted students have a high capacity for understanding concepts more deeply. Teaching gifted students healthy social skills and effective coping strategies are ways to address effective intrapersonal weaknesses to facilitate more manageable interpersonal relationships, such as tutoring a lower performing peer or joining an organization or extracurricular activity or some form of altruistic work. Any of these teaching and learning approaches can assist gifted students learn how to improve their self-assessments, and learn the value and importance of social interactions that are needed to be more balanced and facilitate continued success in a more balanced way; and it can minimize the frequency and impact of challenging experiences.

Developing resiliency serves to enhance protective factor and minimize risk factors among gifted children and adolescents (Armstrong & Manion, 2013; Majid & Alias, 2010). Resiliency can be taught by tapping into the student's strengths, teaching critical thinking skills that decrease negative self-perception and increase self-efficacy. It is healthy and productive to praise accomplishments, be immediate and specific with the praise in conjunction with clear and constructive feedback. Praise and feedback should offer ideas about possible solutions; gifted students require choices to be successful. Developing resiliency means avoiding lectures, constant criticisms, and consequences that are controlling or overbearing. When gifted children and adolescents feel overly or inappropriately criticized or having a lack of control over what is happening to them they lose the motivation and efficacy to preserver.

Suicide Myths/Facts

There are many myths about suicide around gifted children and adolescence that hinder timely and appropriate prevention and intervention (Baker, 1995; Cassady & Cross, 2006). It is especially important to highlight and demystifying such thinking that can create barriers and obstacles because we so often do not associate gifted students with being depressed or suicidal (Cross, Cassady, & Miller, 2006). Not only do the myths make it difficult to identify suicidal risk, they inhibit attempts to be influential in the lives of young children and adolescent who might be experiencing warning signs or active risk factors of depression and suicidal ideations or behaviors (Cross, 2013). For instance, there is a preponderance of evidence that discusses two predominant myths surrounding how gifted students are thought of by just about everyone (i.e., parents, teachers, peers):

Juxtaposition 1: Gifted children and adolescence do not have problems. They are above average; they have sophisticated cognitive ability and therefore can handle any challenges or difficulties independently. What could they possibly have to be depressed or suicidal about?

Juxtaposition 2: Gifted children and adolescence are often described as having characteristics that are perceived as pathological due to their talent and ability. Therefore, warning signs consistent with symptoms of depression or suicide present themselves, they are frequently dismissed as idiosyncrasy of being gifted or misdiagnosed.

General Suicide Myths

Often, it is difficult to know where to start or what to do and how to proceed when trying to identify or provide support in dealing with childhood and adolescent suicide; and there are some myths surrounding gifted students specifically that are important to take into consideration and dispel a bit within the context. Below are some very common myths about suicide in general and gifted students and suicide.

Talking about suicide increases the risk of suicidal thoughts or behaviors. In fact, discussions about suicidal thoughts and feelings can create opportunities to open lines of communication. This has a connected myth, that most depressed or suicidal students will not admit that they have some depressive symptoms or thoughts of suicide. There is a therapeutic impact that occurs when thoughts and fears are articulated. When irrational or illogical ideas are shared an individual is more able to recognize the error of their thinking when it is brought to their attention and can assert change (remember gifted students like challenges if framed appropriately) when presented in a noncritical or judgmental manner. When there are missed opportunities to discuss feelings of depression or thoughts of suicide then there are missed opportunities for intrapersonal and interpersonal social and emotional growth. For example, a student might have the opportunity to see they are not alone and that they have support systems in place or develop feelings of trust. Inquiry can begin as interest in the individual rather than assessment of symptoms and then can progress to a more direct series of questions. In the even that a gifted students should disclose feeling of depression or suicidal thinking this could be a very good sign because it could mean that they have reason to trust and could be the beginning of help-seeking as opposed to attention-seeking. It is appropriate to encourage the student to talk further; the point is not to evaluate in a professional sense but to be able to obtain as much information as possible to be able to solicit consultation from others who might be more knowledgeable or equipped. Upon more direct inquiry, it is acceptable to ask a gifted student if they can explain how they feel in detail or inquire about a specific challenging situation and how they are handling it. If there is a strong indication of depression or poor coping or suicidal ideation, it is acceptable to inquire if they are contemplating harm to themselves or if they have a plan.

Student-Specific Suicide Myths

Aside from general suicide misconceptions are those that pertain to student-specific myths that parent, teachers, and counselors should be aware of so that some foreshadowing about how to handle a suicidal child or adolescent can take place.

Children/teens who talk about suicide are not serious about doing it and do not attempt or commit suicide. In fact, this is more likely to be a sign that the individual is on a trajectory toward a suicide attempt; by disclosing suicidal ideations it is more likely a plea for help (Cross & Cross, 2018). When a child or teen talks about suicidal thoughts it should always be taken seriously and never trivialized. If a child or teen is talking about suicidal thoughts or feelings, this is the time to open up a thread of inquiry to understand the scope of their thinking. For example: Do they have a plan? What is the plan? How long have they had this thought or feeling? It is always proactive to openly discuss how to develop a personal safety plan; for example, step-by-step planning to spend time with others, a schedule of check-in's (especially for counselors) with trusted adults, and focusing on goals and future plans. Keeping a gifted student active and engaged is always productive and developmentally healthy at an intrapersonal and interpersonal level. Discussions that include step-by-step processes can get a gifted student thinking more deeply about how they might be able to construct environmental changes that can stimulate their intellect; and be goal-directed.

Children/teens who attempt suicide are attention-seeking or always show signs beforehand. All suicidal behavior or thought should be taken with the utmost seriousness. Never minimize or diminish suicidal behaviors or thoughts as it is not a goal of a nonprofessional to determine the nature of the individual's intention but to determine how to be the most supportive. Again, this is somewhat linked to another myth, those who attempt or succeed suicide spend a lot of time planning. This could not be further from the truth, children and adolescents can be quite impulsive and become overwhelmed in their lives and actually

commit suicide on accident. In fact, a suicide attempt should never be minimized or dismissed as attention-seeking since it might mean that the individual has an unmet need or has a problem that seems insurmountable. Coping with stress, social interactions, and emotional development are particularly challenging among gifted students so a suicide attempt might be their way of solving a problem. Moreover, it would be remiss to dismiss a suicide attempt as attention-seeking solely on the grounds that we know that suicide can happen by accident (Heilbron, Compton, Daniel, & Goldston, 2010). Although we cannot know how many suicides happen by accident, we do know that not all people who attempt suicide intend to die. Attention-seeking behavior should not be viewed as negative. Giving the individual attention can help identify the need and provide growth and development opportunities while at the same time save their life.

Help-Based Suicide Myths

Parents, teachers, and counselors might hold their own host of myths about child and adolescent suicide.

Don't ask and don't tell. In fact, caring for the health, welfare and safety of students is a large part of the job of parents, teachers, and counselors. Questions regarding depression and suicide need to be asked even with the slightest warning sign. By not asking these important questions we are placing students in jeopardy and we do not fulfill our commitment. Further, if there is an indication or disclosure, then all confidentiality goes out the window. For example, requests of secrecy or private or sealed messages are late signs of a suicide plan and must be acted upon.

Educating children/teens about suicide will increase suicidal thoughts or behaviors. Psychoeducation as a preventative strategy can be very effective when considering the gifted student. Psychoeducation might include discussion about developmentally appropriate challenges and struggles; and how some amount of these challenges can be typical and can exacerbate and subside. Psychoeducation can help open thoughtful and meaningful questions about symptoms of depression and coping productive strategies; as well as, goal-directed problem-solving techniques. Using case scenarios can engage gifted students in a cognitive and intellectual manner. A large part of psychoeducation around depression and suicidal behaviors with gifted students can assist with their tendency toward mastery and perfectionism; fear of failure; and loneliness and isolation. Psychoeducation can address some of these risk factors by cognitive stimulation and practices that promote intrapersonal, interpersonal, and contextual development.

Perfectionism. There is a certain amount of pressure to excel that is placed on gifted children and adolescents. This pressure comes from all directions, just to name the most influential among gifted students are; within themselves, parents, extended families, teachers, and their peers. The pressure to excel can manifest in a need for perfectionism or a combination of thoughts and behaviors associated with high expectations for self and others. Perfectionism is associated in the clinical literature on general populations with a wide range of medical and emotional problems, including depression and suicide. A few things to keep in mind when working with gifted student's challenges with perfectionism is that it is a negative strategy which is unrealistic and inhibiting goals and promoted intrapersonal doubt, ambivalence, poor self-assessment, and emotional torment. When using psychoeducation as a tool for enhancing gifted student's coping mechanisms a perfectionistic mindset holds them back from doing the best they can with what they have. It is much more effective to attempt a positive approach; for example, talk with them about forcing failure; limit time on task and allow revisions so they can improve, ask them to reflect on what they did different, and give feedback on the effort they put forth, focus on the progress versus the perfection, and help them see the positive learning experience about doing the best that they can within the limitations.

Fear of failure. This can be extremely unhealthy, an atypical need to avoid failure.

Gifted students often struggle with making realistic goals and reasonable commitments, which can lead to higher levels of stress alongside a cavity of coping skills in their tool-box.

Loneliness and social isolation. Personality traits of gifted adolescents include a strong tendency towards psychological introversion. This can also be associated with social isolation. According to research, social isolation happens when gifted children are not being accelerated among gifted peers and are not receiving appropriate educational services.

Only counselors/therapist can help a suicidal person. In fact, it is very contrary in reality; therapeutic approaches rely heavily on those that interact with a suicidal individual (e.g., parents, siblings, family friends, and peers) to provide emotional support, take an interest in the individual, report behavioral observations, give encouragement, and feedback on appropriate behaviors. Counselors work with the child/teen on skills that can effectively interact with others; however, it is anyone who interacts with the suicidal individual that can help them progress in more appropriate ways.

Social Media

Social media can be a useful resource for gifted students and their families; however, it can always be a catalyst for perpetuating asynchronous development and risk factors among gifted children and adolescents. Gifted students who are criticized or bullied are more at risk for emotional difficulties (Webb et. al., 2011). Gifted students who are not in environmental or contextually compatible educational setting that are adequately matched with their intellectual needs are more likely to be alienated by peers and exposed to a litany of name calling. Suicide attempts are more frequent among youths who are particularly creative and highly sensitive to criticism from peers. Bullying and cyberbullying is an unfortunate trend that has crept into schools with a lack of supervision before and after school (i.e., bullying); and with the advances in technology (i.e., cyberbullying). However, in doing research for this chapter we found that social media venues such as Facebook, Twitter, Instagram, and Pinterest can be great sources of support for individual gifted children and adolescents; and parents/families of gifted students. On a basic search of Facebook we quickly located several posting for articles from Supporting Emotional Needs of the Gifted (SENG, 2018), and upward of 100 other organizations that provide literature and support; as well as, over 300 personal pages from depressed and suicidal children and adolescents themselves or from families and peers who have lost a child or friend to depression and suicide (see Table 15.3 for nine popular groups). These are valuable, relevant, and salient resources in which organizations and individuals provide a glimpse into the thoughts, behaviors, and emotions of children and adolescents (some even identifying as "gifted" or "Talented). For instance, on a Facebook page (closed because you have to request approval to view the entire page and interact with others) called "Suicidal Thoughts" one young lady identified as being in a gifted program; and surprised by her feelings of inadequacies; writing, "I just need someone to hug me and tell me I'm not as worthless as I think I am."

Pinterest is filled with individual youth and family boards of personal visual representations of feelings of depression and thoughts of suicide. Although we could not find any publish research on social media or social networking as a source or outlet for children and adolescents it is not an extraordinary reach to see that today's youth are turning to social media for self-expression, support, and a call for help. We confidently recommend that moving forward that suicide prevention and intervention programs or protocols for gifted children and adolescents need to include social media/networking that are easily accessible from mobile technology. For the purpose of this chapter it seems invasive to incorporate the messages or images from the social media platforms but it is important to mention that the messages vary from diverse and expressive about feelings of

Table 15.3 Facebook supportive pages for youth and families

Page name/followers	Page description
Supporting the Emotional Needs of the Gifted (SENG) (2018) Website: http://sengifted.org/about-seng/missionvision/ Public 23,170	SENG is an independent, nonprofit 501(c)(3) entity with a diverse Board of Directors, focused on the unique emotional needs of gifted individuals. In 1981, SENG was formed to bring attention to the unique emotional needs of gifted children. Today, SENG focuses on gifted individuals of all ages, from childhood to adulthood to old age. Many schools, communities, and organizations focus on the intellectual needs of gifted individuals. SENG brings attention to the unique social and emotional needs of gifted individuals, which are often misunderstood or ignored. By providing education, research, and theory building, SENG promotes environments where gifted individuals can develop self-esteem, thrive, and utilize their talents
Suicide Prevention and Awareness: David's Story Public 1480	Welcome to Suicide Prevention and Awareness—David's Story!! The purpose of this group is to bring awareness to suicide and mental health and to provide a safe, nonjudgment place for support to anyone who may need it. Feel free to share your stories. This group is part of the David J Cobb Foundation (djcfoundation.org) and we also have a Facebook Page (David J Cobb Foundation). Please visit and join us at each site
Suicide Support Closed 12,801	This group is a support group of friends. It is also a page to vent about feelings, give tips, and to help others. If you want to join, ask to join, it will be open
Suicide Support Closed 10,805	Welcome to Suicide Support! This is a group for individuals contemplating suicide, and individuals that have been directly affected by someone who has passed by suicide. This is a judgment-free zone, and all are welcomed as long as you follow the rules. Please read the pinned post and comment "Read and Agree" in the comments section
Suicide Thoughts Closed 7030	A place to come when you have thoughts of suicide. We want to help find you support. Welcome to Suicide Thoughts! We have set up a few rules to go by. Author note: the list of rules exceeds our space limits, but we urge you to go the FB and review them
Teen anxiety, depression, PTSD, self-harm, and Suicide Support group Closed 1736	First and foremost: TEENS ONLY (ages 13–19). The only adults are admin. This group has been designed with the safety of teens in mind. We are here to be a safe place to talk about your problems, vent, cry, and not be judged or harmed by others. What is said in this group stays in this group, unless we believe someone is in danger
Stop Bullying Abuse and Teen Suicide Closed 2519	This group is for the protection of teens, young children, and adults from abuse and bullying. You can post pictures, poems, fears, memories, ask advice or just someone to talk to. This site is to help save our children from suicide which is a growing number, growing too fast. This site is in memory of those teens. This site is also for adults who are in pain from abuse or bullying. Adult bullying is one of the worst. Also for adults thinking of suicide, please get help. We are here for you too
Mothers Against Suicide Closed 1293	For Mothers and Grandmothers of Suicide Only—If requesting to join, you must be a mother or grandmother who has lost a child to suicide. Our group has beautifully evolved to a loving family of grieving Mothers and Grandmothers who stand together, support one another as survivors, while lifting up our children, and fighting this epidemic in their honor. That is our mission that is our work. Through our stand against suicide we break the bonds of suicide on our lives. Through trusting that the Lord has our children, He saw their struggles and received them and He has them safe in paradise until our time to join them... through this, to the degree our faith allows we obtain a measure of peace
Suicide Grief Support Closed 2372	This group is for anyone who has lost a loved one to suicide. If you are a parent who lost a child to suicide, we have a group called Suicide Grief Support for parents. Feel free to join either group. Our goal is to help you through the hard times and to let you know you are not alone

depression and suicide from a negative, lonely, frustrated and painful place to more positive and healthy perspectives that convey hope, support, and optimistic affirmations. Anyone with an account for the social media applications can search gifted youth suicide and depression to see the public forum of personal thoughts and feelings.

Culturally Diverse Aspects of Depression and Suicide Applied to Gifted Adolescents

According to Mueller (2009), negotiating giftedness may be more challenging for ethnic minorities. Pfeiffer (2012) reported that Asian students are overrepresented in gifted populations due to their high work ethic and academic success. Peterson and Moon (2008), gender and ethnicity can contribute to diminished levels of motivation among gifted students and can negatively impact underachievement. The increased intrapersonal, interpersonal, and environmental stressors of culture on top of the pressure of being gifted often contribute to added risk of depression and suicidal thinking or behavior (Herbert & Kelly, 2006). It is necessary that parents, teachers, and counselors are sensitive and knowledgeable about the added complexities of race, culture, and ethnicity of gifted children and adolescents. Peterson and Moon (2008) recommend additional training that considers multicultural awareness. There are several models of multicultural education that might be applied effectively to gifted students. Some of the specific applications can include cultural identity development, social justice ideology, and respect for diversity (Ford, 2011).

Summary and Conclusion

In the present chapter, we discussed ways of understanding how depression, suicide, risk, and resilience uniquely manifest among gifted children and adolescents by exploring these factors through the lens of person–environment fit theory and the differentiated model of giftedness and talent development. Understanding how intrapersonal, interpersonal, environmental and developmental factors work together during growth transitions allows those interested in developing intervention strategies to effectively treat the whole child. We placed special emphasis on understanding depression and suicide from a holistic perspective—including understanding the intrapersonal, interpersonal, environmental, and developmental factors that influence depression and suicide manifestation among gifted children and adolescents in the twenty-first century. Although depression and suicide sometimes go hand in hand, we believe that a more productive focus for important people in the lives of gifted students is in understanding how to be responsive in ways that support optimal growth (Seligman & Csikszentmihalyi, 2000).

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16 Understanding Underachievement

Del Siegle

Abstract

Up to 50% of gifted children underachieve at some point in their school career; therefore, it is an important issue for parents and educators to address. Underachievement affects children from high as well as low socioeconomic groups. It affects urban as well as rural students. In this chapter, I review factors associated with underachievement and suggest strategies to address the underachievement of gifted children. While no single strategy works with all underachievers, a combination of counseling and instructional interventions show the greatest promise.

Understanding Underachievement

Underachievement involves a set of complex issues that vary across students. Individuals underachieve for a number of different reasons, and no single intervention effectively reverses underachievement for every individual. As a group, underachievers differ more from each other than achievers differ from each other (McCoach & Siegle, 2003a, 2003b). Siegle (2013) reviewed categories of underachievers proposed by Rimm (1997), Heacox (1991), and Mandel and Marcus (1995) and suggested that they fall into 17 different types of underachievers. Therefore, any list of characteristics of underachievers will contain items that fit some, but not all underachievers. Educators and parents often view underachievement synonymously with low motivation. Although underachievement often is the product of low motivation, low motivation and underachievement are not the same. In this chapter, I define underachievement; provide reasons why children identified as gifted might underachieve; and share promising theories and solutions to address it.

Over a quarter century ago, Emerick (1992) noted:

> The gifted underachiever has been described as one of the greatest social wastes of our culture. Beyond social cost, however, there are personal wastes as well---opportunities for advanced educational experiences and personal development are thwarted by academic underachievement. Today, there is no problem more perplexing or frustrating than the situation in which a bright child cannot or will not perform at an academic level commensurate with his or her intellectual ability. (p. 140)

Emerick's statement brings to light two value issues related to underachievement. First, do individuals have an obligation to society and themselves to develop their talents? Is it alright to "get by" without achieving high levels of performance? Second, who determines what talents individuals should develop? Is a highly gifted

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mathematician who chooses a career in music an underachiever because she did not develop her mathematics ability? In some sense, whether an individual is underachieving is "in the eye of the beholder" and what the beholder values. Many underachievers report that they are doing "just fine" and want those who are pressing them to perform better to "get off their back." As Reis and McCoach (2000) noted, "Labeling a student an underachiever requires making a value judgment about the worthiness of certain accomplishments. A teacher may believe that reading *Huckleberry Finn* is more worthwhile than mastering a new video game, but a child may not" (p. 156). Peterson (2001) cautioned that educators and parents should not make future judgements about individuals based on problems experienced during a specific period of time or during some developmental stage. She also suggested that students who are achieving at something should not be a concern. Peterson noted that underachievement becomes an issue when it limits what an individual wants to do. For example, mediocre grades become an issue when a student wished to attend a prestigious university. Therefore, educators and parents must address under performance behaviors that limit future options.

What Is Underachievement?

Underachievement in gifted children is difficult to define for two reasons. First, the field of gifted education has not agreed upon a common definition for giftedness. Second, researchers and practitioners define underachievement differently. Readers will find a discussion of what giftedness is and how to identify it in Chapters 1-3 and 12 of this handbook. For the purpose of discussion, I will use the National Association for Gifted Children definition developed by a panel of respected practitioners and eminent scholars in the field and approved by the NAGC Board of Directors in 2010:

> Gifted individuals are those who demonstrate outstanding levels of aptitude (defined as an exceptional ability to reason and learn) or competence (documented performance or achievement in top 10% or rarer) in one or more domains. Domains include any structured area of activity with its own symbol system (e.g., mathematics, music, language) and/or set of sensorimotor skills (e.g., painting, dance, sports).
> The development of ability or talent is a lifelong process. It can be evident in young children as exceptional performance on tests and/or other measures of ability or as a rapid rate of learning, compared to other students of the same age, or in actual achievement in a domain. As individuals mature through childhood to adolescence, however, achievement and high levels of motivation in the domain become the primary characteristics of their giftedness. Various factors can either enhance or inhibit the development and expression of abilities.

This thoughtful definition notes that giftedness can involve aptitude as well as competence and that, ultimately, as individuals mature they must achieve. Gifted underachievers would be those individuals who fail to ultimately develop their potential. McCoach and Siegle (2003a, 2003b) suggested, "The key features that distinguish gifted achievers from gifted underachievers are the goals they set for themselves and effort they put forth to achieve these goals" (p. 151). The traditional definition of underachievement is a discrepancy between potential and performance (Reis & McCoach, 2002). How each is measured produces a different type of underachiever (Rimm, 2008a). Within the field of gifted education, educators often have measured potential with an IQ test and achievement with achievement tests or grades. Underachievement would be a discrepancy between the IQ and either grades or achievement test scores. However, achievement test scores can also be considered a measure of potential and grades the measure of performance. Emerick (1988) conducted some of the early research on gifted underachievement. She proposed six different discrepancy combinations:

- High IQ score and low achievement test scores
- High IQ score and low grades
- High achievement test scores and low grades
- High indicators of intellectual, creative potential and low creative productivity
- High indicators of potential and limited presence of appropriate opportunity for intellectual and creative development

Whatever the combination, a number of factors need to be considered when making comparisons between potential and achievement. Some gifted students do not want to appear smart, so they avoid demonstrating their ability. Students can be test anxious, and not perform to their full potential (Moore, 2006). Twice-exceptional students may be dyslexic or have a learning disability that interferes with demonstrating their ability. Grades do not always reflect what students know or have learned.

The discrepancy between high IQ and low achievement scores can exist for a number of reasons. Individually administered IQ tests require less reading than achievement tests. Therefore, gifted students with a reading disability may perform lower on the achievement assessment. Moon and Hall (1998) warned that gifted students who are underachieving should be screened for a learning disability. Rimm (2008a) also suggested that a gifted student may be experiencing test anxiety when taking achievement tests that results in lower than expected achievement scores. She also suggested that unchallenging curriculum can lead gifted students to demonstrate defensive patterns through which they avoid achievement, thus resulting in poor achievement test scores. Others (Kanevsky & Keighley, 2003) have also reported unchallenging curriculum can lead to underachievement.

Grades often do not reflect what students know, so that discrepancy between grades and IQ can be misleading. Gifted students may choose not to complete homework assignments, which results in lower grades. "Homework completion, another indicator of academic engagement, appears to be a struggle for many gifted students who underachieve and/or choose to leave high school" (Landis & Reschly, 2013, p. 230). Some believe that students who manage to learn new material each year and perform well on their achievement tests, but do not complete and do poorly on classroom work, could be considered "selective producers" instead of underachievers (Delisle & Galbraith, 2002).

The discrepancy between high achievement test scores and low grades is particularly troubling for educators and parents. Although grades are less reliable than standardized measures of academic achievement, they are an indication of a student's current level of achievement within a classroom environment. In addition, to some extent, grades also reflect students' motivation. The largest longitudinal study of underachievers conducted to date (McCall, Evahn, & Kratzer, 1992) highlighted the importance of classroom grades. McCall et al. found that 13 years after high school, the educational and occupational status of high school underachievers paralleled their grades in high school, rather than their abilities. They also found that underachievers appeared to have greater difficulty completing college and remaining in their jobs and marriages than other students did. Therefore, gifted students with low grades are an area of concern.

Students can demonstrate their giftedness with behaviors not captured with test scores. Educators often use rating scales, such as the Gifted Rating Scales (GRS; Pfeiffer & Jarosewich, 2007) and the Scales for Rating the Behavior Characteristics of Superior Students (SRBCSS; Renzulli et al., 2010) to identify behaviors indicative of giftedness. Educators should be concerned about students who demonstrate the behaviors associated with giftedness on these scales but who are not achieving.

Emerick's (1988) last category is one that is receiving considerable attention. Schools and society do not afford students of poverty and those from underrepresented groups the same educational opportunities as their more affluent and dominant culture peers. For example, the percentage of students eligible for free and reduced lunch in a school is negatively related to the percentage of students identified as gifted (National Center for Research on Gifted Education, 2016). Failing to be identified or attending a school without a gifted program limits these students' opportunity to achieve their full potential. These involuntary underachievers underachieve through no fault of their own. In Germany, Endepohls-Ulpe and Ruf (2006) found gifted underachievers, children with low achievement motivation, and gifted girls were at higher risk to be overlooked as gifted. Therefore, they were less likely to develop fully their talents…in

effect…possibly becoming involuntary underachievers. The definition of achievement in a particular subculture may differ from that of the dominant culture. Additionally, researchers and educators may need to adjust their views of both giftedness and underachievement when attempting to both identify and address underachievement within a culturally diverse student population.

Labeling someone as an underachiever is a value judgement. Should we identify individuals as underachieving because they choose not to perform in areas that they do not value and that are not of interest to them? It is unrealistic to expect gifted students to achieve at the highest level universally. Some gifted students do not put forth effort in areas that do not interest or are not important to them. However, they do excel in other areas that they enjoy and value. "The gifted students who should be of greatest concern to educators and parents are those failing to achieve in *any* productive area" (Siegle & McCoach, 2013, p. 379).

Factors Associated with Underachievement

Gender

Gifted underachievers tend to be male. Over a variety of studies across time, researchers identify underachieving gifted boys at two to three times the rate of gifted girls (Gowan, 1955; McCall, 1994; McCoach & Siegle, 2001; Matthews & McBee, 2007; Peterson & Colangelo, 1996). Females have higher GPAs in school (Duckworth & Seligman, 2005), enroll in college at higher rates (Conger & Long, 2010), and have higher graduation rates (Conger & Long, 2010). However, the ratio of male to female underachievers may be exaggerated. Part of the imbalance may be that underachieving gifted boys tend to draw more attention to themselves by acting out. Some have suggested that many gifted underachieving females are possibly being overlooked (Siegle & McCoach, 2013). Therefore, educators and parents must be alert to possible underachievement with females as well as males.

Peers

Ryan (2001) found that students select friends who have similar levels of academic self-efficacy and achievement. She also found "students' peer group context in the fall predicted changes in their liking and enjoyment of school…and their achievement over the school year" (p. 1135). In other words, students' attitudes and achievement become more like those of their friends. Individuals' behaviors are not only influenced by their acquaintances, but also by their acquaintances' acquaintances (Fowler & Christakis, 2010). Berndt (1999) found that students seemed to more closely resemble their friends at the end of the school year than they did at the beginning of the school year; students' grades decreased between fall and spring if their friends had lower grades in the fall. Kindermann (1993) found that even at the beginning of the year, fourth and fifth grade students tended to affiliate with classmates who shared similar motivation orientations, and they reorganized their peer groups throughout the year to preserve their motivational composition.

Being popular is an issue for many adolescents. Rimm (2005) found that middle-school students worried that appearing to work hard in school would put them into an unpopular "nerd" category. Several studies suggest peer groups significantly influence student achievement (Henfield, Owens, & Moore III, 2008; Schultz, 2002). In fact, underachieving gifted adolescents have reported the peer group influence was the number one obstacle to their achievement (Clasen & Clasen, 1995).

Possible Causes of Underachievement

The literature generally suggests a variety of possible causes of underachievement: an initiating situation, excessive power, inconsistency and opposition, inappropriate classroom environment, competition issues, perfectionism, and value conflicts. Events in students' lives can alter their achievement patterns. This might be a change in the family structure, such as a new sibling, parent divorce or marriage, or a move to a

new school. Parents and educators who are aware of these potential pitfalls can potentially prevent or lessen their impact (Rimm, 1995).

Bestowing adult status on a child at too young an age may contribute to the development of underachievement (Fine & Pitts, 1980; Rimm & Lowe, 1988). Young people who experience excessive power at home can have difficulty adjusting to a school environment in which they have limited choices.

Gifted students who receive conflicting messages from parents, conflicting messages from parents and teachers, or conflicting messages from gifted specialists and classroom teachers may justify reasons not to achieve. For example, students may hear their parents discuss the parents' discontent over the way the school is addressing the student's gifted needs. A gifted specialist may share with students his concern about how their classroom teacher is not addressing their academic needs. Each of these scenarios provides the child with ammunition that can be used as an excuse for not producing his or her best work.

Rimm and Lowe (1988) studied the family environments of 22 underachieving gifted students. In 95% of the families, one parent emerged as the disciplinarian, while the other parent acted as a protector. Often, opposition between parents increased as the challenger became more authoritarian and the rescuer became increasingly protective. Mandel and Marcus (1995) describe the "wheeler-dealer underachiever" who is impulsive and demands immediate satisfaction and instant gratification—traits that are not conducive to reading a book or working on a project. These students often have parents who strongly differ on their views of their child's behavior and what do to about it. Parents of underachievers also tend to be either overly lenient or overly strict (Pendarvis, Howley, & Howley, 1990; Weiner, 1992), or may vacillate between lenient and strict.

Classrooms do not always provide intellectually stimulating environments for gifted and talented students to thrive. Many gifted students underachieve by default; they simple do not receive the academic content or instruction necessary to reach their potential. Regular classroom time is often unproductive for gifted learners. Fredricks, Alfeld, and Eccles (2010) found that regular classes, as compared to gifted education and advanced classes, tend to undermine, rather than support, a passion for learning. Many gifted elementary school students already know as much as half of the material to be covered in their current grade prior to the start of the school year (Reis et al., 1993). The majority of gifted students spend 80% of their time in regular education settings instead of in specialized programs designed to meet their unique needs (Westberg, Archambault Jr., Dobyns, & Salvin, 1993), yet 61% of classroom teachers have not received training in meeting the needs of advanced students (Robinson, Shore, & Enerson, 2007). Matthews and McBee (2007) found that school-year GPA, something that normally would be indicative of underachievement, was not a significant predictor of gifted students' achievement in a summer program designed to meet their intellectual needs. The researchers concluded that programs that successfully address the academic and social needs of gifted children can reverse many underachievement behaviors. Kanevsky and Keighley (2003) reported five C's contributed to gifted students' satisfaction with their learning environment: control, choice, challenge, complexity, and caring. They sought control to give them choice over what and how they learned. They sought intellectual stimulation through content that was challenging and complex. Finally, they sought a caring teacher who was interested in them and their learning.

Students must learn to function within a competitive society (Rimm, 2008b); at the same time, overly competitive situations can also be detrimental. Gifted students who view giftedness as a fixed mindset may be particularly at risk in competitive and academically challenging situations (Dweck, 2000, p. 23). Makel, Snyder, Chandler, Malone, and Putallz (2015) found that many academically gifted adolescents view intelligence as malleable (incremental view) and giftedness as fixed (entity view), while few viewed giftedness as malleable and intelligence as fixed. Gifted students with a fixed mindset may be reluctant to

risk their "giftedness," something they see as set, by performing poorly in competitive and challenging situations. For these students, not performing is less risky than performing and failing. For them, every difficult task is a test of their giftedness, and many become underachievers because they are simply not willing to take that risk. For some, this means not completing the assignment. For others, it means procrastinating and then hiding behind statements such as, "I could have done better if I had more time." Rosario, Schrimshaw, and Hunter (2009) found a strong relationship between procrastination and underachievement.

Because of their fixed mindset, many gifted students do not see their effort as playing a part in their achievement. Siegle and Reis (1998) reported that while the teachers' ratings of middle school gifted students' ability (r = .81) and effort (r = .80) were similarly associated with the quality of work these students produce, gifted students' ratings of themselves were not. Overall, gifted students' responses showed a stronger relationship between their perceived ability and the quality of work they reported they did (r = .72) than between their percieved effort and the quality of work they reported they did (r = .34). The authors contemplated whether these students believed their success was more contingent on their natural ability than the effort they put forth or whether they were simply reporting that they were not being challenged and therefore did not need to work hard to produce quality work. Neither of these proposed scenarios is positive, and both could contribute to student underachievement. Wu (2005) noted that Chinese culture deemphasizes giftedness as an innate ability and emphasizes the concept of talent performance. In that culture, gifted children need to take responsibility for developing their gifts.

Some research (Siegle, Rubenstein, Pollard, & Romey, 2010) showed that first semester achieving gifted college students can believe that ability is important in doing well without developing a fixed entity view. The researchers noted that "although some researchers have cautioned against recognizing student ability at the peril of diminishing the importance of effort, educators and parents should not be fearful of discussing the role ability plays in gifted students' performances, while also emphasizing the importance of hard work and perseverance" (p. 92). Perhaps gifted achievers are able to appreciate the role ability plays in high performance without being paralyzed by it, while gifted underachievers view ability as a possible limiting factor in their success (Siegle & McCoach, 2013).

Perfectionism is an issue for many underachievers. One study found that gifted underachievers do not appear to suffer from many of the maladaptive behaviors associated with perfectionism such as concern over mistakes; rather, underachievers lack the high standards and organization associated with positive striving perfectionists (Mofield, Peters, & Chakraborti-Ghosh, 2016). Although gifted students are no more likely to suffer from perfectionism than other students (Adelson & Wilson, 2009), when students' self-worth is tied to their giftedness and high performance, behaviors associated with perfectionism such as procrastination, fear of failure, and dichotomous thinking may become issues that lead to underachievement (Siegle, 2013).

Finally, value conflicts between family, peers, and the school environment can limit student achievement. As stated earlier, negative peer attitudes often relate to underachievement (Clasen & Clasen, 1995; Weiner, 1992). The reverse can also be true. Positive attitudes about achievement and the future are essential for doing well in school. Mindnich (2007) found Latino students' background characteristics, including gender, generational status, and maternal education level, did not contribute to differences in Latino student achievement, while aspirations for future educational attainment significantly contributed to achievement. The value peers and family place on education plays a role in students' achievement.

Theoretical Models and Possible Solutions

Programs to reverse underachievement generally fall into two categories, counseling and instructional interventions, and often involve a combination of both. Therefore, counselors and

psychologists are in unique positions to help reverse underachievement by working with parents, teachers, and mentors to build underachievers' self-efficacy, teach resilience, help students balance achievement and social needs, help students to develop their strengths and accept weaknesses, and assist students to set realistic goals for success (Rimm, 2008b).

Fong, Snyder, Barr, and Patall (2014) examined the effectiveness of interventions to reverse underachievement. Their meta-analysis of 53 research studies suggested that interventions moderately improved achievement and psychological function. Interventions were most effective in elementary and middle school settings. The most successful interventions for improving achievement focused on instilling a value for learning.

Rimm's Trifocal Model

Rimm's (2008a, b) Trifocal Model has been successful in about 80% of the cases in which it has been used. The name springs from its three-way emphasis on school, home, and student. The model is based on the premise that underachievement is learned, and therefore it can be unlearned.

The model contains six steps. The first step of the model is conducting a comprehensive assessment of the student to document what the student is actually capable of achieving, to provide information about the student's learning styles, strengths, and weaknesses, and to determine what behaviors may be contributing to the underachievement. The second step is communicating to parents and teachers information from the assessment so that they are aware of the students' strengths and weaknesses and what factors may be reinforcing the underachievement.

The third step is changing the expectations of those involved in the situation. This includes helping the student recognize that he or she has the ability to be successful, helping parents set reasonable expectations at home, and helping teachers set realistic learning goals for the student and understand the student is capable of high achievement.

The fourth step is identifying achieving role models with whom the student can identify. Rimm emphasized "All other treatments for underachievement dim in importance compared with strong identification with an achieving model" (Rimm, Siegle, & Davis, 2018, pp. 255–256).

Students with a long pattern of underachievement will have skill deficiencies that need to be addressed, which involves the fifth step in Rimm's model. Fortunately, because they are gifted, gifted students can often quickly overcome these deficits with tutoring. The final step is making changes that support student achievement and discourage behaviors that feed underachievement. These may include adjusting to a more appropriate curriculum and learning environment, as well as addressing parent and teacher behaviors that may be reinforcing the student's nonproductive habits.

Snyder and Linnenbrink-Garcia's Maladaptive Competence Beliefs and Declining Value Beliefs Pathways

Snyder and Linnenbrink-Garcia (2013) proposed a developmental, person-centered theoretical approach to understanding underachievement. In their model, underachievement follows two pathways: the Maladaptive Competence Beliefs Pathway and the Declining Value Beliefs Pathway. In this model, students' early reactions to being identified as gifted and the challenge, or the lack of challenge, they encounter early in their school career can set them on one of the two pathways that ultimately become problematic as academic challenge increases. Some students' sense of identity becomes maladaptively tied to both their gifted label and their easily attained early achievement. When the curriculum becomes more difficult, these students may self-handicap and disengage to protect their gifted identity. Alternatively, some students are not maladaptive to their gifted label; however, due to insufficient challenge in school work, they fail to see value in academic work. By failing to develop a connection between effort and positive outcomes, they

set themselves up for disengagement and underachievement as academic content becomes more challenging. Implications from this model suggest that parents and teachers should carefully consider how they discuss the gifted label, and educators should ensure gifted students encounter appropriately challenging curriculum early.

Renzulli and Reis's Schoolwide Enrichment Model

In a study of university freshman honors students, Siegle et al. (2010) found that in 15 different talent areas (from leadership and music to mathematics and writing) there was always a significant, positive relationship between students' interest in a talent area and their assessment of their skill in that area. Students who reported being interested in an area tended to do well; those with lower interest also had lower self-reported achievement. Playing off students' interests is a key to increasing passion for learning in schools. Fredricks et al. (2010) suggested that an intellectually stimulating and challenging environment can be created by the following:

> Cognitively complex tasks that are both meaningful and challenging and allow youth to pose and solve real-world problems can help accomplish this goal. Providing opportunities for students to incorporate their outside interests and future plans in their schoolwork is also likely to be beneficial. Finally, teachers should give youth some choice over the types of activities they work on and some control over how they complete these activities. (p. 27)

Fredricks et al.'s suggestion mirrors the Type III activities found in the Schoolwide Enrichment Model (Reis & Renzulli, 2009). Baum, Renzulli, and Hébert (1995) used Type III activities with 17 gifted underachievers ages 8–13. Eighty-two percent of them made positive gains during the course of the school year and in the following year. Hébert and Olenchak (2000) also found a plan of strength and interest-based strategies reversed the underachievement.

Type III Enrichment activities are academic investigations that focus on (a) personalization of interest, (b) the use of authentic investigative and creative methodology, (c) problems without predetermined correct answers, and (d) development of a product with impact on one or more intended audiences (Reis & Renzulli, 2009).

Type III investigations are a component of the Schoolwide Enrichment Model (SEM; Renzulli & Reis, 2014) and the Enrichment Triad Model (Renzulli, 1977) and are often the result of an interest sparked through the student's participation in a general exploratory activity (Type I Enrichment) and involve training in cognitive and affective skills (Type II Enrichment). Research on students who engaged in Type III Enrichment suggests a relationship between students' early and subsequent interests (Westberg, 2010), postsecondary school plans (Hébert, 1993), career choices (Delcourt, 1994; Starko, 1988), goal valuation (Brigandi, Siegle, Weiner, Gubbins, & Little, 2016), levels of self-efficacy (Schack, Starko, & Burns, 1991; Starko, 1988), and ability to self-regulate (Hébert, 1993).

Siegle and McCoach's Achievement Orientation Model

The Achievement Orientation Model (see Fig. 16.1; Siegle & McCoach, 2005b) posits that beliefs and values students hold toward themselves, given tasks, and achievement itself influences what tasks students seek, and whether they are able to obtain them. In the model, students' self-perceptions in three areas (self-efficacy, goal valuation, and environmental perceptions) interact to motivate them to self-regulate their behaviors and subsequently engage and achieve.

The model is based on motivation principles and has been used to reverse underachievement (Rubenstein, Siegle, Reis, McCoach, & Burton, 2012). Self-efficacy beliefs answer the question, "Am I smart enough?" Students must believe they have the skills to perform a task before they will attempt it. For example, students must believe they are capable in mathematics before they will attempt a difficult math problem. If they believe that mathematics is too difficult, they are unlikely to put forth appropriate effort. Therefore they must believe they can learn the material if

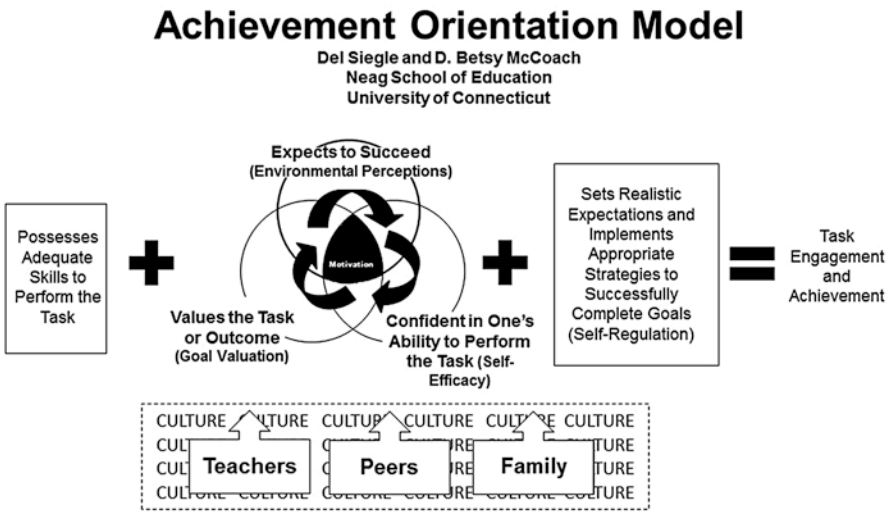

Fig. 16.1 Achievement orientation model. Reprinted with permission of Del Siegle

they try. Goal valuation beliefs answer the question, "Why try?" There are two basic reasons that students engage in a task; either they enjoy the activity or they value the outcome or byproduct of the activity. Many students are not motivated to achieve in school because they do not value the outcomes of school, nor do they enjoy completing schoolwork; therefore, they see little value. To reverse underachievement that stems from not seeing purpose in the work, educators must build into students' school experiences activities and content that students value. Environmental perception beliefs address the question, "Can I be successful here?" Students must view their environment as friendly and likely to provide positive outcomes for them. Students who possess positive environmental perceptions believe their home and school environments support their efforts. Their perception of the friendliness of their surroundings has an impact on their academic attitude and behavior (Siegle & McCoach, 2005a).

Students must possess positive affect in the areas of self-efficacy, goal valuation, and environmental perceptions. The intensity of their positivity in the three areas need not be equally strong, but it must be positive. If any of the three do not meet a "threshold" value, students may fail to be motivated and subsequently underachieve. Intense positivity in one of the three areas does not compensate for negativity in one of the other areas (Siegle, McCoach, & Roberts, 2017). However, beliefs and values are not sufficient. It is the addition of the self-regulation metacognitive process that ultimately results in achievement (Brigandi, 2015).

Although there is no silver bullet to address underachievement, educators who implemented combinations of the following strategies have successfully addressed underachievement for many students:

- Explain the purpose for lessons and assignments.
- Help students set short and long-term academic goals.
- Help students see beyond the present activity to the long-term benefits it produces.
- Tie assignments to "real-world" situations.
- Learn about student interests, and integrate these interests into schoolwork.
- Offer students authentic choices about the ways in which they learn and show mastery of the material.
- Offer instruction at levels that are optimally challenging.
- Build opportunities for immediate feedback into classroom activities.

- Work with students to help them articulate their reasons for choosing or failing to put forth effort in a class.
- Develop portfolios of student work and periodically share it with students to help them recognize their growth.
- Encourage students to compete with themselves by charting their own progress.
- Recognize student growth by complimenting specific skills and drawing attention to the student's role in developing the skills.
- Discuss with students the obstacles they believe are keeping them from doing well and what options exist for them.
- Listen actively to resolve students' concerns.
- Provide opportunities for students to interact with more challenging and interesting material.
- Evaluate what study skills are needed to be successful.
- Help students organize their work and study time.
- Encourage self-monitoring skills that review distractibility, delayed gratification, and awareness of performance avoidance.
- Help students plan school work tasks.
- Stay positive and do not give up, all of us are works in progress.

Conclusions

Some students naturally reverse their underachievement during later high school years; others do not. Others reverse their underachievement when they encounter a caring teacher or mentor. Still others reverse their achievement when they encounter a more healthy environment (Peterson, 2001). Just as gifted underachievers differ in their reasons for underachieving, so do strategies for helping them achieve differ from one student to another. Research on achieving students suggests that successful students believe that they have the skills to be successful, see purpose in what they are doing, and trust those around them who support their efforts. They also set realistic expectations and self-regulate (McCoach & Siegle, 2003a, b).

Schultz (2002) noted that gifted students are often seen as defective merchandise in need of repair" (p. 204). He suggested that educators move away from this perspective of working on students and move to a perspective based on working with students. Working together, parents and educators can help students build an achievement-oriented attitude. However, as Whitmore (1986) noted over a quarter a century ago, "The final choice, obviously, is the child's; he or she must want to change and believe effort will be rewarded by sufficient success and personal satisfaction" (p. 69).

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17 Counseling the Gifted: Current Status and Future Prospects

Steven I. Pfeiffer and Renata Muniz Prado

Abstract

This chapter provides a critical review on the topic of counseling the gifted. The chapter takes the position that a scientifically defensible approach starts from the perspective that the counselor or therapist follows a model of evidence-based clinical practice. Evidence-based clinical practice, according to the authors, is defined as the integration of the best available research with clinical expertise in the context of understanding the world of the gifted youngster. A clinical case is presented to help illustrate evidence-based practice in working with a troubled gifted adolescent.

Introduction

As many contributors to this Second Edition have already pointed out that gifted children and youth are an often misunderstood, special-needs population. Part of the challenge is that they are different, in many ways, from their non-gifted peers. Another factor contributing to the confusion is the fact that there is not one universally accepted way to define giftedness (Pfeiffer, 2009, 2015).

Perhaps not surprising, gifted students encounter the full range of psychosocial and socio-emotional challenges that any child or adolescent might encounter or struggle with in today's society. Gifted students, however gifted is defined, can experience troubling and even debilitating depression, anxiety, loneliness, suicidal ideation, physical and sexual abuse, and illegal drug use. They can experience teasing and peer relation problems, conduct, impulse control, and anger management problems, post-traumatic stress disorder, thought disorder, ADHD, mood disorders, sleep disorders, eating disorders, parent and family conflict, and learning disabilities (Pfeiffer, 2013; Pfeiffer & Foley-Nicpon, 2018). The point of this chapter is that the gifted student is not impervious to any of the mental health problems or stressors which today's youth face, both here in the USA and globally. We also know that today the incidence of mental health problems is significant. Growing up has never been an easy process, and today's children and youth face new and more challenging pressures that previous generations could not have imagined. Experts estimate that one in five students in school today have significant mental health problems (Pfeiffer, 2003).

In addition to the full range of mental health problems that any student, including gifted

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students might encounter during childhood and adolescence, there are certain developmental challenges and problems that, if not unique, are certainly more frequently encountered among gifted students because of their gift or because of how society views gifted individuals.

The following is a list of some common challenges that the gifted may experience that can set the stage for a need for counseling. It is important not to forget, however, that most gifted individuals are well adjusted and do not present with clinical or subclinical psychological problems that warrant counseling or psychotherapy (Neihart, Pfeiffer, & Cross, 2016; Robinson, 2002). But some gifted youngsters do, and for this reason we need to be mindful of these developmental challenges.

Unique Developmental Challenges

- A substantial number of intellectually gifted students experience a significant mismatch with their educational environment. This mismatch can create boredom, inattentiveness, academic underachievement, and even conduct problems in the classroom. Many bright students are out of sync with their classmates and peer group, creating feelings of alienation, loneliness and not being understood. The more gifted the student, the more out of sync they can be expected to be.
- A number of chapters in this Second Edition and many authorities in the gifted field talk about how our society is marked by an anti-intellectual culture (Gallagher, 2008; Robinson, 2002; Subotnik, Olszewski-Kubilius, & Worrel, 2011). The gifted child's social environment can feel unsupportive and even be experienced as emotionally toxic.
- Although there are only a few empirical studies supporting this position, some authorities contend—based primarily on case study and anecdotal evidence, that many gifted suffer from negative or neurotic perfectionism. The first author has seen this very issue in his private practice. This would lead the gifted to be more vulnerable to self-criticism, anxiety, and emotional withdrawal.
- Another, as yet unconfirmed by hard research, set of beliefs are that many gifted suffer from maladaptive motivational characteristics and heightened sensitivities/over-excitabilities. The first author has also seen these issues in his private practice. However, at the present time, we do not have any community-based epidemiological evidence corroborating or, for that matter, refuting these hypotheses. Whatever the actual incidence of these characteristics among the gifted, counseling certainly is one possible intervention for students with below optimal motivation or heightened intensities/over-excitabilities.
- The highly gifted (145 IQ and above) and the twice exceptional are two subgroups that present with asynchronous development across domains (Peterson & Moon, 2008; Pfeiffer & Foley-Nicpon, 2018). These asynchronies create challenges to normal socialization and peer relations.
- As pointed out by Kerr in this Second Edition, gifted females can struggle with achievement—affiliation conflicts in adolescence and career development choices in young adulthood (Reis, 1998, 2006). Gifted African American males face unique developmental challenges, as well. Their peer group culture is not supportive of academic excellence, which can exert pressure to underachieve and even act dumb (Steinberg, 1996).
- Bullying and teasing is a serious peer issue for all students, and one that, unfortunately, is more prevalent among the gifted. One study reported that 67% of gifted eighth graders experienced bullying and 11% experienced repeated bullying (Peterson & Ray, 2006). A study that our research lab completed indicated that 72% of our sample of gifted high school students reported having experienced negative name calling, compared to 40% among a non-gifted comparison group. We also found that gifted students were teased more frequently than non-gifted students (2.3 vs 1.9 incidents, on average), yielding a significant *t*-test

(0.05 level) and medium effect (d = 0.38). We also found that name calling negatively correlated with self-esteem and feelings of belongingness (Saintil & Pfeiffer, 2017).

- Gifted students can experience considerable anxiety over early career planning. Because of their precocious intellectual and academic development, and often wide variety of interests, aptitudes and abilities (Kerr, 1990), some gifted students can experience anxiety over career planning because of their broad range of choices or because they are not ready to select a career path (Sampson & Chason, 2008).

Do the Gifted Require a Unique Type of Counseling?

A chapter on counseling the gifted would be remiss if it did not raise the provocative and even inconvenient question of whether a unique approach is required in psychotherapeutic work with gifted children and adolescents. Many in the gifted field who write about counseling the gifted feel that this is a basic maxim. That gifted students warrant a different and unique approach if counseling is to be effective. There are only a handful of publications specifically written on counseling gifted students. Four books that come to mind are Ziv (1977), Colangelo and Zaffrann (1979), Silverman (1993), and most recently, the volume edited by Mendaglio and Peterson (2007). By and large, these authors emphasize the importance of the therapist recognizing the uniqueness of the client's giftedness as a starting point in therapeutic work with individuals of high ability. These books offer many valuable insights and clinical vignettes. We think that it is fair to state that these authors as a group emphasize the uniqueness of the gifted child. And as a result, perhaps inadvertently neglect to give equal weight to the evidence-based approaches to treating the various problems that bring gifted youngsters to treatment, as a central tenet of their approach to counseling.

The approach which we advocate, and which undergirds this chapter, supports a somewhat different position. We contend, based on the first author's experience as a therapist and a clinical supervisor, and on our shared careful reading of the clinically relevant literature, that a scientifically defensible approach starts from the perspective that the therapist follows a *model of evidence based practice* (Pfeiffer, 2014). Evidence-based practice is defined as "the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (APA Task Force on Evidence-Based Practice, 2006, p. 273).

Our position in working therapeutically with gifted children and youth embraces the following points. A more detailed presentation is found in Pfeiffer (2013, 2014):

- No one theory explains all of what can go awry when a gifted child develops psychological problems, and no one theory can hope to explain all of counseling. However, there are specifiable and useful theories that help guide the design, implementation, and evaluation of treatment programs for specific problems exhibited by the gifted (Kendall, 2006). In our opinion, the most useful counseling theories are those that explain the *processes of change*. Understanding the processes of change helps gain a focus, specific treatment targets and objectives, and insights into why a given client might or might not be responding favorably to the planned intervention. In any clinical work with gifted clients, it is important to know which therapeutic processes are helping to create the change you are working towards.
- Work with the gifted should almost always address the parents, parenting, and families. In our experience, and this axiom is supported by considerable clinical research, the inclusion of parents in the treatment of children with behavioral, social, or emotional problems increases the likelihood of a favorable therapeutic outcome. Of course, the nature and extent of the parent or family involvement will vary by the unique circumstances of each case. But it is clinically imprudent to ignore the gifted child's parents. This does not mean

that the parents or family necessarily need to be counseling clients. What it does means, however, is that the therapist must consider and respect the role of the parents and family in the etiology, maintenance and/or treatment of the index client's problems.

- There now exists considerable clinically relevant research on almost every type of psychological problem that one might encounter in work with a gifted client. There are published articles in peer-review journals on the prevalence, expression, associated symptoms, developmental trajectory if left untreated, and response to treatment for almost every developmental, neuro-medical, psychiatric, and educational disorder that exists. With the advent of the Internet, it is easy for even the busiest practitioner to access targeted literature searches. The *e*Medicine Clinical Knowledge Database is a continually updated evidence-based resource with extensive psychiatric information and specific modules on addictions. *e*Medicine is a product of WebMD and is available free of charge at www.emedicine.com/. Many professional and government organizations have created evidence-based practice websites. For example, the Substance Abuse and Mental Health Services Association (SAMHSA) website at www.samhsa.gov includes extensive data and reports, including the surgeon general reports. SAMHSA also features the National Registry of Evidence-Based Programs and Practices NREPP), a database of mental health and substance abuse treatments freely available at www.nrepp.samhsa.gov/find.asp. Information on the effectiveness of alternative treatments is available at this site. The Society of Clinical Child and Adolescent Psychology, Division 53 of the American Psychological Association, supports a web site on Evidence-Based Mental Health Treatment for Children and Adolescents. The Division of School Psychology (16) of the American Psychological Association sponsored a Task Force on Evidence-Based Interventions in School Psychology. The Task Force was endorsed by the National Association of School Psychologists and produced a 136-page procedural and coding manual in support of promoting and disseminating evidence-based interventions in schools (Kratochwill & Stoiber, 2002). What we are saying is that there is easily available clinically relevant research on best practices and evidence-based interventions which should guide counseling. Norcross, Hogan, and Koocher (2008) published a paperback entitled, *Clinician's Guide to Evidence-Based Practices* which includes a chapter on how to easily search for and locate the best available research and information on almost any clinical question.
- The final point is the recognition that the quality of the therapeutic relationship, often called *the therapeutic alliance*, is essential in all effective counseling and psychotherapy (Bachelor & Horvath, 1999; Bordin, 1979; Falkenbach, Poythress, & Heide, 2003; Gelso & Hayes, 1998; Horvath, Del Re, Flückiger, & Symonds, 2011; Kazdin & Durbin, 2012; Zilcha-Mano, 2017) including counseling the gifted. This may sound like an obvious, almost no-brainer counseling axiom. But it has remained a cornerstone in our understanding of what makes counseling special and what helps gifted children and adolescents take the risk to change. In the first author's experience, it is impossible to encourage, nudge, or even inspire a gifted child or adolescent who is struggling with a personally painful or distressing or embarrassing problem to change what they are doing, thinking, or feeling if they do not trust the therapist and do not feel that the therapist is sincerely concerned about their well-being. All clients in counseling, but particularly children and adolescents, need to feel that the therapist understands and even feels, to a degree, what they are personally experiencing (Kazdin & Durbin, 2012; Norcross, 2002). In essence, there needs to be a palpable bond that the practitioner must work to create between herself and the client if counseling is going to be effective. The therapeutic alliance is defined by the quality of the client–therapist relationship, their collaborative interaction, and the attachment

between the two that develops over the course of counseling (Pfeiffer, 2013). Research consistently supports the fact that therapeutic alliance, measured by adolescent self-report, is a reliable predictor of treatment outcome for children and adolescents (Florsheim, Shotorbani, Guest-Warnick, Barratt, & Hwang, 2000).

In terms of establishing a therapeutic alliance with the gifted client, the two concepts of empathy and unconditional positive regard are as relevant today as when Carl Rogers first wrote about them (Corey, 2005). Establishing and maintaining a therapeutic alliance with the gifted child or adolescent is part of what we consider the *clinical expertise* of the therapist. Clinical expertise includes making wise and prudent clinical decisions, timing interventions well, understanding sociocultural and ethnic nuances, being comfortable with kids and familiar with their world and what interests them, being knowledgeable about developmental psychopathology and normal development—including what is normal for gifted kids, and knowledgeable about psychologically healthy environments. Clinical expertise also includes being kind and considerate, being patient, and respecting that change often is difficult and scary for the client, and takes time. Lazarus (1993) wisely advised that therapists tailor their relational approach to the client's expectations, and in effect, customize counseling so as not to treat every client in the same manner. Lazarus humorously called this elegant therapeutic relationship accommodation "being an authentic chameleon" (Lazarus, 1993, p. 404). We wholeheartedly agree with this clinical axiom and have found it beneficial in our clinical work with gifted clients.

Earlier in the chapter we stated that we advocate an approach which starts from the perspective that the therapist follows a model of evidence based practice. Evidence-based practice is defined as "the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (APA Task Force on Evidence-Based Practice, 2006, p. 273). In workshops, the first author often uses the metaphor of a 3-legged stool in explaining what constitutes evidence-based practice. The first leg of the stool is being knowledgeable about the population that you are working with—in this instance, the gifted. It could just as likely be working with children from migrant families, adolescents who gay, lesbian or transgender, young children with physically disabilities, first generation youth from Kuwait, Iraq, Iran, Somalia, or Afghanistan, or youngsters with multiple foster care placements. Although all children and youth worldwide are similar in many ways, distinct groups of children—including the gifted, are distinctive in many important ways, including sharing unique concerns, issues, preferences, characteristics and experiences.

Therapists working with any distinct group of children, including the gifted, need to be knowledgeable about the group. The first author, many years ago, was invited by the Bureau of Indian Affairs to provide psychological services to the Havasupai Native American Indian tribe. He quickly learned through a series of unintended missteps how ignorant he was about the culture, values and beliefs of this tribe. It served as an important lesson that one must become quite familiar with the population that one intends to work with. The gifted are no exception. Fortunately there are many excellent references on the social and emotional world of the gifted and their family, including many chapters in this Second Edition. Another excellent resource is the Second Edition of *The social and emotional development of gifted children: What do we know?* coedited by Neihart et al. (2016).

The second leg of the metaphorical stool is familiarity with the best available and most up-to-date clinically relevant research literature. We have already indicated that it is relatively easy to access online clinically relevant research on almost any type of psychological problem that one might encounter in their counseling practice. WedMD, PubMed, PsycINFO, MEDLINE, SAMHSA, the National Guideline Clearinghouse (www.guideline.gov), and Google Scholar (www.scholar.google.com) offer free search

access to literally thousands of reports, book chapters, articles, conference proceedings, and citations. An increasing number of professional organizations, including the American Psychological Association and American Psychiatric Association, are creating "evidence-based practice" (EBP) sites and posting updated evidence-based information. When counseling gifted students, the therapist must be current with the best available clinically relevant research literature on the problem. For example, a graduate student who the first author supervised began seeing a gifted first grader presenting with general symptoms of anxiety and school refusal behaviors. He directed the student to check the available current research literature on these specific clinical problems. The graduate student found that individual and parent cognitive-behavior therapy (CBT), family CBT, and CBT for school refusal with parent/teacher training were considered efficacious treatments. She decided that this would be a clinically wise starting point in her work with this young gifted child.

The third leg of the metaphorical stool is developing clinical expertise. As mentioned above, clinical expertise includes a variety of elements that converge to promote positive therapeutic outcomes (Martin, Garske, & Davis, 2000; Norcross et al., 2008). Clinical expertise takes time to develop, in fact, many years of clinical practice under supervision. The development of clinical expertise requires ongoing professional training and exposure to different ideas, techniques, and ways of viewing how one operates as a therapist. Clinical expertise as a therapist also requires a willingness to shift or change what is not facilitative of therapeutic change, and an openness to grow, learn anew, and adjust one's therapeutic posture or style (Lazarus, 1993). The first author wrote about the importance of these therapeutic elements more almost 30 years ago, and still finds them highly relevant (Pfeiffer, 1986).

These three legs of the evidence-based counseling stool, taken together, create a powerful and almost magical context for therapeutic change to occur. These three components of evidence-based counseling, a deep knowledge about gifted kids, relying on the best available clinical research, and developing clinical expertise, together create, we believe, the therapeutic context and leverage required to bring about beneficial change.

What follows is an example of applying evidence-based counseling with a gifted adolescent who the first author treated in his private practice, first reported in Pfeiffer (2013). The example illustrates the components of evidence-based practice when working with a gifted adolescent who was referred because of substance abuse, recurring suicidal threats, and pervasive feelings of loneliness, despair, and desolation. Although we use an actual case with a specific set of clinical issues, the point that we intend to make about evidence-based counseling gifted clients can be applied to almost any case.

Treating a Gifted Adolescent with Borderline Pathology

Borderline personality disorder (BPD) is a serious psychiatric disorder that affects approximately 2% of the adult population (Lenzenweger, Lane, Loranger, & Kessler, 2007; Sharp & Kim, 2015). Persons suffering from BPD display multiple symptoms including intensive efforts to prevent real or imagined abandonment, a pattern of personal relationships characterized by instability and intensity that fluctuates between extremes of idealization and devaluation, impulsivity including high-risk behaviors such as substance abuse, binge eating, high-risk sex, recurring suicidal ideation, gestures or threats, pronounced emotional instability, and inappropriate, impulsive, and/or intensive anger (American Psychiatric Association, 2000). For a variety of reasons, BPD is difficult to diagnose and, some argue, of questionable diagnostic validity in adolescence. This has led many clinicians to describe borderline adolescent symptomatology rather than make a formal diagnosis and use the term "borderline pathology" when referring to adolescents presenting with BPD symptomatology (Crowell et al., 2008). It is estimated that the prevalence of borderline pathology in adolescents is as high as

3–14% (Crowell et al., 2008). Because of the very real associated risk of suicide (Anderson, 2002), effective treatment of adolescent borderline pathology is a critical mental health issue. Although there is exists no epidemiological data, it is reasonable to assume that the incidence of borderline pathology among intellectually and academically gifted adolescents is equivalent as the reported rates among adolescents in general.

Jonathan (his name has been changed to protect the client's privacy and anonymity) was referred by his parents at the encouragement of his school psychologist because of recurring suicidal ideation and behaviors, reported substance abuse, and depression and pervasive feelings of loneliness and despair. He had been seen by a psychiatrist who suspected that Jonathan was "borderline" BPD—the psychiatrist was diagnostically conservative in respecting the fact that Jonathan's impulsivity, emotional instability, and existential angst might more reflect developmental issues and not a true Axis II psychiatric disorder. The initial impression after interviewing Jonathan and his parents and reviewing his case file was that he qualified for the diagnosis of borderline pathology. Jonathan was obviously gifted, whichever definition one might choose to apply—he had an outstanding academic record attending an elite, competitive private school, an IQ of 135, and combined SAT scores of 1160 taken when in the seventh grade as part of a regional talent search, and the previous year had been the only freshman on his school's debate team). He was also a painfully unhappy young man who was engaging in high-risk, unsafe, and potentially self-injurious behaviors. It was apparent that this gifted adolescent desperately needed treatment.

Dialectical Behavior Therapy (DBT) (Kliem, Kröger, & Kosfelder, 2010; Miller, Glinski, Woodberry, Mitchell, & Indik, 2002; Neacsiu, Rizvi, & Linehan, 2010) is an empirically validated therapeutic intervention for adults with BPD. DBT was developed by Linehan to apply cognitive behavioral treatment (CBT) to borderline personality patients exhibiting suicidal and para-suicidal behaviors (Katz & Cox, 2002; Linehan, 1993). We will not go into a detailed description of DBT in this chapter; the reader interested in learning more about this evidence-based intervention is referred to Linehan (1993), Linehan and Dexter-Mazza (2008), and Katz, Fotti, and Postl (2009). DBT is based on a transactional model in which the borderline pathology is viewed as the result of cyclical interactions between an individual's biological predispositions for emotional dysregulation and an invalidating environment (Katz & Cox, 2002). Interestingly, some gifted are described as overly intense and highly overexcited, based on a theory of "overexcitabilities" first proposed by the Polish psychiatrist Kasimierz Dabrowski (Kitano, 1990). In fact, some authorities posit that intensity is "an almost universal characteristic of gifted children and adults" (Webb et al., 2005; p. 10). Although we are not convinced that this temperamental characteristic is shared by all or even the majority of intellectually gifted, the first author has seen gifted youngsters marked by emotional and/or psychomotor over-excitability in his clinical practice.

In work with Jonathan, which lasted over the course of almost 2 years, the first author employed a DBT approach. He modified the standard protocol somewhat since the model was developed for and empirically validated with adults, not adolescents. For example, one significant modification that he incorporated was involving Jonathan's family in the treatment, particularly in the phase where we worked on behavioral skills training. This modification follows the recommendations of DBT experts (Katz et al., 2009; Miller, Rathus, Linehan, Wetzler, & Leigh, 1997). Early in counseling, the therapist emphasized playing devil's advocate in challenging Jonathan's dangerous and life-threatening behaviors (substance abuse, suicidal behaviors) and working to enlist his interest and commitment to the therapeutic process. The therapist's experience working with many gifted adolescent clients helped him understand Jonathan's style of thinking, resistance to confronting his self-defeating behaviors, and world view. Jonathan did not feel accepted or liked at his school; he was hypersensitive to teasing and sarcastic comments from peers.

Without the experience of working with many similar adolescents and without the understanding and appreciation for what was unique about Jonathan as a gifted youngster, the therapist would not have been able to enlist his participation in the treatment. And without his active commitment to therapy—and the establishment of a working therapeutic alliance, even the most powerful therapeutic techniques that DBT has to offer would have proven useless (Wampold, 2015). In other words, in work with gifted clients, "common factors" are important and make a difference.

After successfully engaging Jonathan in his treatment—which required about six or seven sessions and considerable effort and patience, much of counseling was skills-based, consistent with the DBT model. The therapist's posture was clearly as a consultant and adviser to Jonathan. Many sessions focused on decreasing his substance use and high risk sex and increasing his repertoire of behavioral skills. Mindfulness, emotional regulation, distress tolerance, and social and interpersonal skills training were introduced, consistent with Linehan and Dexter-Mazza (2008). During skills training, the first author and Jonathan frequently enacted and then processed role plays. Jonathan was often assigned homework tasks. Because Jonathan held rather rigid, polarizing points of views—not uncommon among bright adolescents with borderline pathology, one therapeutic strategy which was employed was helping him accept a "middle path" and adopting a less harsh, judgmental perspective (Miller et al., 2002). Many sessions were spent working on this specific goal.

Finally, a considerable amount of counseling focused on encouraging Jonathan to search for positive emotional experiences in his daily life. The therapist's familiarity with gifted adolescents made this phase of the treatment less challenging. Working with adolescents in general can be tricky (Pfeiffer, 2013; Verhaagen, 2010). Working with gifted adolescents or, for that matter, any group of children or adolescents who are different in a substantive way from mainstream youngsters is uniquely challenging.

This case illustrates four key points. First, evidence-based practice requires more than simply being aware of the best available clinically relevant research. However, the second point is that relying on clinically relevant research is certainly a critically important first step in work with any client, including a client who happens to be gifted. It would have been clinically imprudent, and even perhaps unethical, to not consider DBT given Jonathan's presenting constellation of problems (Norcross et al., 2008).

The third point is that evidence-based practice also requires clinical expertise. There is considerable evidence that the therapist's training, skill, and experience promote positive therapeutic outcomes (Norcross et al., 2008). As we have already stated, clinical expertise takes time to develop and consists of sound clinical judgment and decision-making, monitoring client progress (or lack thereof), knowing when to nudge or challenge the client and when to back off, and the timing of interventions. Clinical expertise also includes awareness of one's competence and limitations, and willingness to seek consultation and available resources as needed (Norcross, Beutler, & Levant, 2006). Finally, the fourth point of this case vignette is that evidence-based practice recognizes that patient characteristics matter. Competent clinical practice necessitates a deep understanding and appreciation for the unique characteristics, preferences, culture, and world view of each patient that you are working with. This is as true for the gifted client as it is for the client who is LGBT, elderly, from a different culture or racial/ethnic group, or gender than your own. Keen awareness of the cognitive, social, and emotional characteristics, unique concerns, preferences, and challenges facing gifted students is critically important if one hopes to be effective in counseling the gifted student with problems.

Zilcha-Mano (2017), an Israeli psychotherapist, points out that establishing and maintaining a working therapeutic alliance can be tricky with some clients. She distinguishes between trait-like and state-like components of alliance. Essentially, Zilcha-Mano contends that trait-like components of the alliance include the client's ability to form

satisfactory relationships with others, their internal representation of self and others, and their expectations from interpersonal relationships. These trait-like abilities can and often affects the client's capacity to form satisfactory relationships with the therapist, and the client's capacity to benefit from counseling (Zilcha-Mano, 2017). In other words, the therapist's well-intended efforts at establishing trust, conveying unconditional positive regard and warmth, and creating a therapeutic alliance with the client can be limited by the existing traits of the gifted client. Wampold and Budge (2012) offer the sage reminder that no client comes to therapy *tabula rasa.*

Concluding Comments

In emphasizing an evidence-based practice model applied to counseling the gifted, we have omitted a few important topics that bear at least brief mention. In the following pages, we discuss four such topics: preventive counseling, career counseling, incorporating strength-based/positive psychology into treatment, and measuring success.

Preventive Counseling and the Gifted

Not all gifted students who would benefit from individual or group counseling present with a clinical or even subclinical problem. Most gifted students, in fact, do quite well socially and emotionally, are well-adjusted and effectively navigate the challenges encountered in their homes, schools and neighborhoods (Neihart et al., 2016). Even so, preventive counseling is cost-effective and shown to be efficacious (Capuzzi & Gross, 2014; Conyne, 2015; Hage et al., 2007; Pfeiffer & Reddy, 1999, 2001). A growing number of gifted programs include an affective curriculum implemented by the teacher (Betts, 1986; Betts & Neihart, 1986; Moon, 2002). The first author is piloting a school-wide social-emotional learning curriculum that incorporates encouraging mindfulness and character strengths (Niemiec, 2014); preliminary findings suggest an overall reduction in teasing and bullying, and increases in levels of empathy, compassion, gratitude, and subjective well-being.

Preventive groups for gifted students in schools are another powerful intervention. As well as running preventive and support groups for parents of gifted students. Groups can be open-ended or closed. Closed groups have a specific start and end date and group members are recruited with the expectation that they will attend all of the scheduled group meetings. They typically are short-term, and meet for 1–6 sessions, depending upon the focus of the group or curriculum adopted. Open-ended groups, on the other hand, can continue over the course of a semester or even a school year with gifted students or parents able to "drop in" whenever they find a topic of interest. The interested reader can find more details on groups in Pfeiffer (2013). Parents of high ability students have unique concerns and questions, and SENG (Supporting the Emotional Needs of the Gifted; www.sengifted.org), an international organization dedicated to the emotional concerns of the gifted, developed an excellent guide for facilitators of parental support groups (Web & DeVries, 1993). Although there is no published research on its efficacy, attendee feedback is uniformly favorable, and anecdotal evidence indicates that these groups are well received by parents.

Bibliotherapy is another viable preventive counseling strategy for gifted students and their parents. There is no shortage of self-help books and guides to parenting gifted children. Prufrock Press (www.prufrock.com) and Great Potential Press (www.giftedbooks.com) have published the majority of self-help and parenting books in the gifted field. The first author coedited one such book for Prufrock Press written for parents of young gifted children, *Early Gifts: Recognizing and Nurturing Children's Talents* (Olszewski-Kubilius, Limburg-Weber, & Pfeiffer, 2003). Biographies of famous people and select Hollywood films can serve as valuable resources of high appeal with the potential to convey important personal lessons and facilitate the character strengths of gifted

students in meaningful and lasting ways. The movie *Good Will Hunting* is one example of a film that many adolescent clients find profoundly insightful and love to discuss. There are numerous well-written biographies on and books written by famous individuals who gifted kids can relate to. For example, Stephen Hawking's book, *A Brief History of Time* (Hawking, 1988) a popular read and inspirational for twice exceptional gifted students with SLD, ADHD, and physical disabilities. Professor Hawking has Lou Gehrig's disease, but has not let this debilitating condition slow down his brilliant accomplishments.

Career Counseling

Therapists can use counseling to help gifted adolescents make informed pre-career and career choices. Career counseling includes knowledge about career development, career problem solving, and career decision-making. As the chapter on career counseling in this volume argues, career counseling is a specialization with a long history and extensive research. However, it is a unique type of counseling that requires specialized training and supervision. One evidence-based approach to career exploration and decision-making is the Cognitive-Information Processing (CIP) model (Peterson, Sampson Jr., Lenz, & Reardon, 2002; Reardon, Lenz, Peterson, & Sampson Jr., 2017; Reardon, Lenz, Sampson Jr., & Peterson, 2011). The CIP approach specifies that the gifted adolescent will make prudent career-choice decisions if she can effectively process information in the self-knowledge and occupational knowledge domains and if she possesses good decision-making and executive processing skills. The CIP model addresses an adolescent's readiness to make informed and careful career choices while considering multiple factors that can influence career development (Sampson & Chason, 2008).

Authorities in the career development field remind us that career success has as much to do with interpersonal relationships as intelligence. Mulitpotentiality has been defined as "the ability to select and develop any number of career options because of a wide variety of interests, aptitudes, and abilities" (Kerr, 1990, p. 1). The concept of multipotentiality is similar to low differentiation of interests and ability in Holland's (1997) theory of vocational choice (Rysview, Shore, & Leeb, 1999). Multipotentiality can complicate career planning for the high ability student because they have more choices and options than their non-gifted peers. There have been challenges to the widely held concept of multipotentiality, notably by Achter, Benbow, and Lubinski (1997), who found low differentiation of ability profiles among a large cohort of intellectually gifted students. Despite Achter et al.'s (1997) reproach of the validity of the multipotentiality construct, it is indisputable that gifted students, by nature of their heightened abilities, have greater career options. And this can create the mixed blessing of more options generating more anxiety and confusion, thus emphasizing the real value of counseling.

A Strength-Based Focus

There has been a growing paradigm shift in psychology, with heightened interest in focusing on the positive aspects of human nature. Historically, our field emphasized pathology, risk factors, and impediments to human development. More recently, the mental health field has shifted to focusing on assets and strengths of the individual, and assets within the environments in which they live (Bronfenbrenner, 1977; Csikszentmihalyi, 1990; Fredrickson, 2001; Seligman & Csikszentmihalyi, 2000). Theorists now recognize that the impact of counseling increases when therapists focus on identifying and reinforcing traits, skills, competencies, and protective factors that promote mental health and well-being (Pfeiffer, 2013; Suldo & Shaffer, 2008). Scholars correctly argue that indicators such as resilience, hope, optimism, and gratitude provide powerful leverage in optimizing human functioning (Luthar, 2006; Park & Peterson,

2008; Sapienza & Masten, 2011). We contend that this positive focus can and should be incorporated into counseling, including work with gifted clients (Pfeiffer, 2015).

The scientific study of optimal human functioning, known as "positive psychology," has contributed to our understanding of how character strengths and virtues, such as curiosity, love of learning, honesty, enthusiasm, generosity, compassion, and social and emotional intelligence help individuals and communities to thrive and flourish. These very character strengths and virtues can be woven into counseling to facilitate positive change (Lyons, Huebner, Hills, & Shinkareva, 2012; Pfeiffer, 2015; Seligman & Csikszentmihalyi, 2000; Suldo & Shaffer, 2008).

One example of therapists relying on building resilience and incorporating a strength-based perspective with gifted clients is reported by Renati, Bonfiglio, and Pfeiffer (2016). Another example using coping strategies to achieve positive adaptation within adversity among vulnerable clients is reported by Lee, Cheung, and Kwong (2012).

A resilience-focused, strength-based approach can be tailored to impact any of three levels: the individual gifted child, the family, and the social environment. Overall, the focus should include: (a) developing and practicing personal coping skills using training and role plays, including new resources to learn assertiveness, decision-making, relaxation, optimism, and self-control; (b) enhancing parental and family resources, since the family is the primary social support for the gifted child. These can include teaching positive parent–child communication and interactions skills, effective monitoring of child behavior, and effective discipline, rules, and limit setting; (c) promoting experiences and opportunities for developing supportive friendships, positive teacher interactions, academic success, and emotional well-being within the school environment (Cutuli et al., 2013; Niemiec, 2014; Zolkoski & Bullock, 2012).

Measuring Success

Finally, we conclude with an intentionally brief discussion on the value of measuring change and improvement—or lack thereof, in counseling the gifted child. We believe that it is extremely helpful—and ethical, for therapists to incorporate a practical and reliable data system for measuring change in treatment. We emphasize "practical" because we recognize that most child and adolescent therapists, whether they practice in schools, in an agency, or in private, are very busy and do not have the time to implement a complex assessment protocol for their clients. The system needs to be simple and easy to administer, score, and interpret.

In work with children and adolescent clients, self-report and parent and teacher report scales are particularly useful and readily available. Of course, the scales (or subscales) that the therapist selects to use to measure progress should directly reflect and reliably measure the goals and objectives of the individual treatment plan. No one test or scale will work best for all clients. The therapist will want to remember two points in establishing a system to measure change and success in counseling. First, client progress waxes and wanes, even in the best of circumstances. And not all clients improve, for many reasons (Lambert, 2013). Second, what may seem like improvement, or for that matter, lack-of-progress or even deterioration, may simply reflect the vagaries of the psychometric qualities of the test, and not any real changes in the status of the client. The therapist needs to be cautious when collecting data on the client to not over-interpret slight and nonsignificant increases or decreases in test scores. Strupp and Hadley (1977), in a now-classic article on psychotherapy, recommend that therapists should use a "tripartite model" to evaluate client improvement. Applied to the gifted client, the therapist would routinely collect outcome data directly from the client (child/adolescent self-report data), from the parent and teacher (rating scales), and finally, from the perspective of the therapist herself. These three independent sources of information

provide, Strupp and Hadley persuasively argue, a comprehensive picture of how the client is functioning, and affords more reliable estimates of the positive impact of counseling on the client's functioning. The tripartite model, elegant in design, unfortunately may stretch the notion of simplicity in everyday counseling practice. The important point here is that it behooves the therapist to routinely collect outcome data on the gifted client to determine whether, for each client, the planned interventions are helpful or not. Robertson and Pfeiffer (2016) provide suggestions on how to measure gifted student improvement within a response-to-intervention (RTI) model in schools.

Concluding Comments

This chapter provides a brief, critical review on counseling the gifted. We argue that a scientifically defensible approach to counseling the gifted begins from the perspective of following a model of evidence-based clinical practice. Evidence-based clinical practice consists of the integration of the best available research, with clinical expertise, in the context of understanding the world of the gifted youngster. We provide a clinical vignette to help illustrate evidence-based practice in working with a troubled gifted adolescent.

Because of space limitations, there is much that we neglected to cover. As one example, we do not discuss evidence-based treatment applied to a multicultural population. The interested reader is directed to a recent article on this important topic published in *Gifted Education International* (Yeo & Pfeiffer, 2016). We hope that the chapter will provide a clear and compelling rationale for counselors and therapists who counsel gifted clients and their families to follow a model of evidence-based clinical practice.

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18 Career Counseling for the Gifted and Talented: A Life Span Development Approach

Carol Klose Smith and Susannah M. Wood

Abstract

One milestone of adolescence is determining a career direction. For the nation's most talented students, evidence suggests that conventional approaches to career development may not be adequate. This chapter outlines the unique challenges of providing career counseling to gifted students, and provides an examination of how social cognitive career theory can be used to assist students. Finally, the career needs of various special populations of gifted and talented students are examined.

Why do people work? This question is a deceptively simple place to begin on a book chapter focused on career development for the gifted and talented individual. For some the answer may be quite simple: in order to supply oneself with the basic needs of maintaining life (i.e., having adequate food, shelter, clothing, etc.). While other individuals may see work as a way to fulfill other more complex motivations such as gaining a sense of personal identity, fulfilling a need to give to society, and to have a purpose within society (Lent & Brown, 2013a). In sum, individuals work for a wide variety of reasons. The role work plays in our lives is complex and ranges from "working to live" to "living to work." An individual's world-view of work and what work means in their lives has an impact upon many facets of the career development process. At times within our culture, a "…premium is placed upon approaching work as an opportunity to achieve growth, purpose, meaning and social contribution" (Lent & Brown, 2013b, p. 5). How one sees the role of work, how one's family approaches work, and how we as a society value work all contribute and influence the career development process.

Career development refers to the process of formal and informal experiences that provides information about an individual's talents, interests, values, and knowledge of the world of work. The process begins in childhood and continues throughout one's life: from early knowledge of self, to career decision-making, to working, and finally to retirement. An important part of this process is career choice which is at its heart a decision-making process of selecting, training, and entering a career, while career development encompasses one's total experience with work or career.

The research around career counseling and gifted students has vacillated over time often with the politics of the gifted education movement itself (Kerr & Fisher, 1997). From the post-Sputnik era in the early 1960s to the initiatives and strategies to attract gifted and talented student

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into science, technology, engineering, and mathematics (STEM) careers has influenced, albeit sometimes indirectly, the career decision-making of gifted and talented students. Overall, within the gifted and talented literature much of the focus has been upon career choice and career selection processes especially barriers and challenges that exist for the gifted and talented student. Often this research has been focused on the decision-making processes of secondary education students and the career development process of college students. However, for the secondary level or college student career choice is often not the start of the process. According to Watters (2010) the career decision-making process begins much earlier and will continue into adulthood. Career development is a lifelong process that schools often initiate but continues far after an individual leaves the educational environment (Kim, 2013).

For the gifted and talented student evidence suggests that career counseling should begin early (Watters, 2010). Many states are now mandating that schools assist in creating academic plans that align with a student's post-secondary educational goals. This process is generally formalized with written plans at 13 or 14 years of age. For the gifted and talented student this process may need to be accelerated; since it is not uncommon for an early emergence of career interests since many gifted and talented students are seriously contemplating their future by age 9 (Willings, 1986). This early emergence of career interests is an important consideration for those working with gifted students. The need for career counseling is often far greater than their same age peers which creates a mismatch between students' needs the career curriculum provided in schools. This may put gifted students into seeking information on their own. Without a solid comprehensive approach to career planning students will look for role models closest to them which may leave them not fully cognizant of all their many options. This is especially true for gifted and talented student who live in rural areas or who are from impoverished backgrounds.

In addition, to the issue of early emergence some additional challenges for the provision of career counseling services within the schools are often present. Currently, there is much more of a focus on college and career readiness in schools from the federal government as well. Former First Lady, Michelle Obama's Reach Higher initiative invigorated the ideas of careful academic planning for students to prepare them for their future career goals. Unfortunately, this initiative did not also include additional funding for schools, which left many schools in the position of providing these academic planning and career counseling interventions with the existing resources. While useful, these interventions target a more general student body, and many school counselors still struggle to find the time for such interventions (Anctil, Smith, Schenck, & Dahir, 2012). While school counselors highly value providing career development to students, they often struggle with balancing the various needs within a school and providing a differentiated career and academic planning interventions (Anctil et al., 2012). Given the high school counselor-to-student ratio, it is not very surprising that one of the most requested services by parents of gifted and talented student is career counseling services (Yoo & Moon, 2006). In addition, many school counselors are not well versed in the unique needs and challenges inherent in working with career development concerns of the gifted and talented student (Wood, 2010). Gifted students and their families may then rely upon their own personal experiences, teachers and others to help develop career plans (Greene Burton, 2016). This avenue is only as good as one's connections and the information available to them and may assist beyond exposure to careers in the immediate sphere in which a student grows and develops.

For the student who is gifted many of these complexities in career decision-making may be impacted by their abilities and personal characteristics, as well as sociocultural or environmental influences. These issues which will be discussed later in the chapter are: Multipotentiality, early career emergence, expectations of self and others,

personality traits, and special populations (e.g., gender, LGBT, race/ethnicity, and adult populations). Although there is not a prototypical gifted individual there are certain considerations that are important to understand when providing career counseling for students who are gifted and talented.

This chapter posits that students who are gifted and talented need career development and counseling earlier and systematically, thus creating a comprehensive career development and academic planning process that cumulates in a career choice (Watters, 2010). The authors of this chapter contend that the process continues even beyond determining a career path but extends into the pursuit of obtaining and performing at the chosen career. Furthermore, career development should not only be developmental and comprehensive, but also be purposeful (Pfeiffer, 2013). Careful and thoughtful planning utilizing a theoretical approach is also advantageous.

Career developmental theories exist in order to explain and make sense of a complicated process of one's work life. Given the complexity and the numerous variables that can impact one's career life, many career theories have been created. However, only a few have been applied to the unique needs and concerns of the gifted and talented student. Gottfredson's (2005) theory of circumscription, compromise, and self-creation; Super's (1963) theory of career development; and the cognitive information processing approach (Peterson, Sampson Jr., Lenz, & Reardon, 2002) have had recent writings applying these theories to the gifted and talented individual (Chen & Wong, 2013; Muratori & Smith, 2015; Sampson & Chason, 2008; Wood, Smith, & Duys, 2017). In addition to the more traditional theories, more recently derived approaches such as an ecological model (Hook & Ashton, 2002) and constructivist (Maxwell, 2007) have shown promise with this population as well. This chapter focuses upon career development being a lifelong process beginning in childhood and continuing throughout one's life. As such using a career development model that emphasizes this approach as well as incorporates the interaction between the individual's thoughts and their interaction within their environment makes Social Cognitive Career Theory an appropriate choice for working with gifted and talented individuals (Watters, 2010).

SCCT Theory

Social cognitive career theory is especially useful in providing a solid approach to career development with individuals who are gifted and talented. SCCT with its focus upon career development as a lifelong process focusing upon an individual's internal and the sociocultural environmental factors, and the cognitive and social dynamics that interact and influence career decision-making. Like Bandura's social cognitive theory, social cognitive career theory examines self-efficacy, outcome expectations and goal setting within a career framework. Self-efficacy beliefs refer to an individual's judgment of their own capabilities to successfully execute a plan (Lent, 2013). Self-efficacy is intricately tied to one's confidence and self-beliefs. Outcome expectations refers to an individual's beliefs about the result of certain behaviors (Lent, 2013). Personal goals is defined as an individual's intentions to pursue a particular outcome (Lent, 2013). SCCT asserts that an individual's choice and performance goals are inextricably linked to how one thinks of themselves and their outcome expectations. This theory highlights human agency, which is the ability of an individual to make their own career decisions and direct their own vocational behavior (Lent, 2005). Social cognitive career theory (SCCT) currently consists of four overlapping tenets or predictive models aimed at understanding career interest development, choice-making, performance and persistence, as well as satisfaction and well-being (Lent & Brown, 2013b). The following sections will highlight each of the four models and provide application suggestions for working with gifted and talented individuals.

Education and Occupational Interest Development

As children grow and develop families, schools and communities provide exposure to wide variety of activities. These activities and pursuits are constantly filtered by the individual and the community to provide feedback. As students perform activities or engage in pursuits they receive feedback from other families, peers, teachers and community members, and this feedback is incorporated into their future approaches to those activities. This feedback becomes internalized and the student is more likely to develop self-efficacy and outcome expectations around mathematics. And, if this pattern persists, and the student enjoys mathematics, may point to a future career path.

According to SCCT's interest model, self-efficacy beliefs and outcome expectations regarding particular skills and talents help to mold career interests. This theory examines both internal processes as well as external environmental forces that may influence career interests. From an internal perspective, as an individual grows and learns about their likes and dislikes they begin to engage in goal setting. Early in this process it may be an increasing interest or involvement in an activity. However as time progresses goals may be influenced by various experiences that heighten or modify the desire to continue to pursue preferred activities (Lent, 2013). Continuing upon the example of the student who has shown an interest and aptitude in mathematics, she or he may find that over time and with increased exposure to a greater variety of activities that they would rather use their mathematics skills in order to pursue engineering or computer science than in studying mathematics. This process for students is iterative and evolving. In addition to examination of one's internal processes this theory also examines how self-efficacy and outcome expectations develop within one's sociocultural environment. Outcome expectations are also shaped by the social environment and one's interaction with this environment. Aspects of gender, twice-exceptionality, race/ethnicity, sexuality, and socioeconomic factors all play a role in the career development process and influence one's self efficacy beliefs, outcome expectations and the goals and individual sets for themselves.

SCCT posits that an individual's career decision-making requires exposure to and education about specific occupations and an exploration of personal interests, talents, and values. Ideally having specific interventions aimed at learning about one's interests, the values one holds and specific talents is important in the development of a comprehensive career development plan. Helping professionals working with gifted individuals need to keep in mind that career decision-making should accompany tasks that can facilitate a deeper understanding of who they are as people.

Developmental Exposure to Careers

Exposure to occupations and career paths should begin as early as elementary school. Young gifted students are making sense of who they are as individuals leading to the development of self-concept (Kim, 2012). Sex role indoctrination with regard to career choice also begins at this stage (Kim, 2012). Elementary school students need opportunities to discover their talents and interests as well as limitations and weaknesses. In addition, young children are learning rudimentary social skills, thus activities, including problem-based learning, that encourage cooperation and team work can help students learn skills useful in their future academic and career lives (Kim, 2012). Even at this stage, many gifted students are sensitive to what others think of them and the messages that they receive including how parents and teachers and peers feel about specific careers (e.g., becoming a nurse is "less than" becoming a doctor) (Kim, 2012). Students who appear to be already committed or at least very interested in one specific career or field of study is called early foreclosure. While it is unclear if early foreclosure is problematic, it is helpful to provide opportunities for the student to gain skills that will help them in their field of interest. In addition, identifying potential mentors and role models will assist the student in envisioning the path to their goals as well as determining if there is a good fit (Kim, 2012; Muratori & Smith, 2015).

By middle school, gifted students may need assistance seeing the relevance of academic subject to their possible career futures. School-based helping professionals, such as school counselors, typically are responsible for helping students develop 4-year plans which serve not just as academic blueprints for high school planning but also a venue for discussion about future careers and/or college decisions (American School Counseling Association (ASCA), 2013). Students, hopefully, have identified a few areas of interest or potential fields of study. The goal then becomes developing specific skills necessary to enter these fields or higher education opportunities such as time management, prioritization, study and organizational skills (Silverman, 1993; Wood, 2010). Gifted students also can benefit from developing and honing decision-making skills as well as "soft" skills that can help with interviewing and team work, both useful for a variety of careers. "Curiosity, persistence, flexibility, optimism, and risk-taking are as important to develop as domain-specific knowledge and skills in gifted and talented students" (Greene Burton, 2016, p. 261). At the same time, as students' progress from middle and high school, academic content becomes more specified.

In high school, career decision-making and college readiness become much more critical. Students at this stage need more specific information about colleges so that they can evaluate whether they will be a "good fit." Geography, scholarships and financial aid opportunities, campus life, student diversity, and technology are all considerations to evaluate in terms of advantages and disadvantages (Kim, 2012). College is simply a transition between high school and the world of work. Discussions should occur around how college prepares students for their next steps including what additional costs or training might be needed after college for their chosen occupation (Colangelo, 2003; Kim, 2012). Gifted students need time to consider career paths and narrow them accordingly. However, parents, educators, and helping professionals should keep in mind that some of the careers gifted students may have in the future are not even present in today's work force.

Greene Burton (2016) suggests that career exploration for gifted students should take into consideration "global megatrends" (p. 264). Technology, globalization, and urbanization are all arenas that will expand in the next 10 years. Green-collared jobs, software programming and coding jobs are those that did not exist 20 years ago. Each generation of gifted students has different ideas about employment. Generation Z who are considered Digital Natives (e.g., individuals who grew up with and are facile with computers, cell phones, and social media) are used to constant communication and the sense of being connected as well as being more fluent in moving from task to task (Greene Burton, 2016; Prensky, 2001). On the other hand, constant use of social media may impinge on the development of social skills and delay of gratification which are still necessary to many career fields (Gallo, Rausch, Smith, & Wood, 2016). Greene Burton (2016) recommends that students consider how they can combine multiple interests to create careers that do not yet exist. Regardless of where students are in their development, educators and helping professionals have many different ways to expose students to occupations (Kim, 2013).

The Role of Assessments in the Exposure to Careers

The use of career interest inventories, value inventories, and other types of tests comes with both advantages and disadvantages when applied to gifted students. The use of career inventories can assist with broadening awareness of various careers as well as assist in providing information about oneself. However, some cautions are important when working with gifted students in examination of ability testing. First, not every test that is normed on the same chronological population is utilitarian in finding nuanced values and interests. Thus, educators and helping professionals should consider using to use above level or adult scale, in order to avoid the high-flat phenomenon on ability and interest tests. This ceiling effect detracts from meaningful useable results for gifted students. Second, tests are not able capture all the important information necessary (e.g., extracurricular activities or activities students choose to engage in during free time) in order for students, parents, and educators need to

consider in order to make wise career choices. At best assessments only capture a portion of the puzzle at that point in time. Third, not every gifted student will enjoy specific tasks that might be required of the test or require them to have a specific skill set or resource to take it (e.g., familiarity with computers). The above information is not meant to dissuade the use of assessments. Greene (2003) suggests that gifted students may benefit more from assessments that incorporate forced choice, self-reflection, and experiential components. However, the type of test chosen and the interpretation of its results should be meaningful to the specific student (Muratori & Smith, 2015). These authors write:

> Interest inventories can be advantageous in the career development of gifted students; however, the results must be processed in small groups or individually with the student, allowing for ample reflection and discussion. (p. 179)

Hands-On Activities

Career Fairs. Gifted students can gain exposure to different types of career paths through current school programming. Career fairs are one venue of exposure that can occur at elementary, middle, and high school levels. While the format and structure may vary, in the traditional format, community members from a wide variety of local businesses and colleges are present to discuss pathways and answer student and parent questions. Students can "browse" or rotate through various stations this activity provides a lot of exposure to a wide variety of careers. While career fairs are common occurrences, there is scant research to support their efficacy (Kolodinsky et al., 2006). However, the career fair should not be the sole career exploration activity for students, but a small part of a comprehensive plan with may include such activities as: interest inventories, career knowledge development (e.g., determine the degree of higher education required and the potential future salary for various careers) resume writing, and mock interviewing.

Career Genealogies. Exposure to different types of careers happens naturally in the family context. Family activities emphasize the specific values and interests that family members have which also can shape vocational and avocational pursuits (e.g., concerts and art shows, sports games, technology fairs) (Hall & Kelly, 2014). Career genealogies require students to extend their thinking from their immediate family to how each of their extended family member's careers influenced and continue to influence the current family. This activity can require students to go as far back as needed when researching careers, higher education, and/or technical training of parents, grandparents, aunts, uncles, and cousins. However, it is recommended that the student is allowed to determine who is included in the definition of family which may include nonbiological members or extended friends and community members. If there are few resources or accessible family members, then genealogies could be replaced by in-depth interviews with the individuals who comprise the family. Educators and helping professionals can help students brainstorm questions to ask beforehand and then provide a space for reflecting on what they found from either activity. Silverman (1993) also suggested that schools create services for parents of gifted students with regard to career exploration including discussions on expectations, nurturing talents, finding mentors and expert instructors, using biographies, early and late career decision-makers, and college planning including financial aid.

Academic Inquiry. Separating academic skills and content from career exploration and exposure does not help gifted youth with their career development. Exploration of careers can be accomplished via academic coursework including the use of biographies, problem-based learning, and even developing and answering specific research questions. Hébert (2009) provides several examples of the use of biographies of eminent people can help students' explore not only careers but also specific values and skills used in pursuing their careers (or changing them). The study of biographies can help gifted students explore how "careers are made and are related serviceably to civilization, and to all the various

kinds of intellectual work required by the world in their day" (Hollingworth, 1926, pp. 319–320). While Reis and Gaesser (2014) provide suggestions of areas for researchers to explore with regard to gender, socialization, and careers, we suggest that these areas can become areas of student research and problem solving as well. For example, students could research why men and women leave certain rigorous courses in both high school and college, and focus on STEM areas as needed.

Online Resources. School-based college and career exploration can involve students accessing several different online resources such as O*NET's Work Importance Profilers. Some states and school districts actually have prescribed curriculum that involve online career and college exploration and even e-portfolios that follow the student and which include 4-year high school planning blueprints and the results of career inventories. Having students gain access to these resources prior to high school may be a great way for students to engage in this process at an earlier grade level. Educators of the gifted may wish to consult and collaborate with the school counselors in their districts and buildings to determine what is being used and if it can be integrated into gifted education programming.

Regardless of the mechanism of career exposure, gifted students need time and space to reflect and process on what they have learned such as challenges and successes, outcomes from career assessments, and feedback from mentors and employers (Sampson & Chason, 2008). This space allows students to develop self-awareness about their values, interests, and skills and how these fit with potential career paths and personal goals.

Choice Making

A major developmental milestone for adolescents is determining a career path. Consistent with many developmental career theories, choosing a career is not a single choice point. Instead it is a part of a dynamic process that unfolds over time. SCCT stresses that career choice is preceded by the development of self-efficacy, goal formation and outcome expectations (Lent, 2013). Over time, as a student learns about their personal interests and abilities, certain career paths become more attractive while other choices become less viable (Gati & Levin, 2015). This includes not only the expression of an initial choice, but includes taking actions to implements one's career path and subsequent success or challenges in pursuing that career goal. Events and circumstances may influence this process and impact one's pursuit of a career. Such events as poor job prospects, career barriers, barriers to educational opportunities and affordability of education may also play a role in discouraging goal formation.

Multipotentiality. One aspect of career choice that has received a lot of attention within the gifted literature is a focus upon the gifted student who is interested and able to pursue a wide variety of careers to the point in which no direction is being chosen. This situation has had various labels such as multipotentiality (Achter & Lubinski, 2005), overchoice syndrome (Rysiew, Shore, & Leeb, 1999), or career indecision (Greene, 2003). While estimates vary approximately 5–23% of gifted students may experience challenges on selecting a career path or area for future study (Achter & Lubinski, 2005; Milgram & Hong, 1999). From an outside perspective, this all seems like a good problem to have. Who would not want to be able to "do anything?" However, having many choices can be confusing and anxiety producing for the gifted student and their families (Rysiew et al., 1999). What to do with one's life is not a simple decision for most individuals and for the gifted student they often have the additional pressure of families, educators and others expectations. Rysiew et al. (1999) points out that delays in deciding a career path may be related to poor decision-making skills. The consequences of delaying career decision-making may result in students not being able to reach their full potential (Jung, 2012). What is clear regardless of definition is that some students do need extra support and assistance in determining an interest area and later career plans. Career counseling that focuses on sorting

through the various options is important. This process may need to be individualized for the student in order to fully explore the options under consideration.

Academic Challenge and Self-efficacy. One of the biggest areas of concern with gifted and talented students is the provision of academic challenge. However, with challenge comes the risk of failure and the need to gain perseverance and coping strategies, areas that also correspond to the performance and persistence component of SCCT. Yet working with academic challenge is integral to building positive self-efficacy; in order to build self-efficacy, trial and error must occur. Underachievement in gifted students has been linked with poor self-efficacy (Richotte, Matthews, & Flowers, 2014). The ideal academic situation is a "good match between the child's developmental needs and the learning environment" (Neihart, Pfieffer, & Cross, 2016, p. 287). That balance is difficult to find. On the one hand, lack of challenging academic coursework has the student assume that learning "should be" easy. Then when confronted with challenging academic work, students may believe that they are not as bright as they have been told (Muratori & Smith, 2015; Siegle & Langley, 2016). On the other hand, having "over challenge" or an academic environment which goals and expectations are too high can mean anxiety and unhealthy coping skills. Either pathway can lead to students questioning their abilities, talents, and mindsets and ultimately lead to underachievement, task avoidance, and withdrawal. Building positive self-efficacy in academic areas can come down to student-environment fit. But gifted students are varied, and many do not fit with one particular profile. Thus academic planning for gifted students needs to be flexible enough to account for a variety of contextual factors not just the student's areas of strengths. "Although some schools may resist adopting this view, especially when they have a large student body to serve, curricular flexibility and openness to acceleration are necessary in order to accommodate gifted students' strengths and challenges" (Muratori & Smith, 2018).

Hands-On Activities

Academic Blueprints. Flexibility in academic planning is not a new concept. As early as 1993, VanTassel-Baska recommended formulating academic blueprints which matched academic coursework with student talent as a best practice (VanTassel-Baska, 1993). In 2010, Wood surveyed gifted high school students and found that a little less than half (47.7%) reported that making an academic plan or blueprint tailored to their needs and interest as valuable. Corwith and Olszewski-Kubilius (2012) note that academic planning for gifted learners must acknowledge and incorporate specific educational opportunities, such as advanced content through acceleration, enrichment, out-of-school options, and/or early entrance. During this process of academic planning it is essential to consider idiosyncratic conditions of the student such as learning styles, pace of learning, prior content knowledge, strengthes and passion areas,. For example, a gifted student in 8th grade who may be ready for Advanced Placement Biology may not be as strong in language arts. This student will need additional avenues for academic learning in sciences earlier, so their high school curriculum may require college coursework or, depending on the readiness of the student, early entrance to college. Environmental factors such as access to educators of excellence, competitions and work with mentors and adults in the field of interest need to be considered (Corwith & Olszewski-Kubilius, 2012). In this case, this student may benefit from science competitions, or working with local community college university faculty in biology. Lastly, academic planning should help students and educators find gaps in both knowledge and skills. As academic rigor increases, so does the need for students to be able to set goals and priorities, as well as being able to organize their time and materials. Preparing this eighth grader for his or her future may mean considering what they will need for early entrance to college including the degree of organization and time management it takes to be successful in this environment.

Experiential Programming. Gaining self-efficacy beliefs and outcome expectations are an important part of career development. Providing opportunities to assist gifted students in gaining a deeper understanding of their skills and values through actual experience with the world of work is important. Gifted students can gain career exposure through opportunities such as shadowing, internship, volunteering and part time work (Silverman, 1993). Career shadowing entails students shadow a professional in their area of interest for a day or a week. Journaling, reflective discussions, and additional information seeking follow (e.g., salary potential, required education, and related careers). Internships are based on an apprentice model in which students work in a professional setting for a period of time without pay but gaining school credit. Students who have completed coursework might benefit from part time employment as a "safe" way of trying out an occupation or potential career. Mentorships provide gifted students with the opportunity to work with adults who are already succeeding in the student's chosen field of interest. Mentors know their fields intimately and thus are excellent sources of knowledge about how to gain entrance into that field both in terms of training and education but also through networking and the field-specific soft skills (Callahan & Dickson, 2008; Watters, 2010). Research has supported that these are the type of opportunities that gifted students would like to see included more in their high schools (Wood, 2010). In fact, in her study, when gifted students were asked which potential career services would be valuable, the students choose working as an apprentice, mentorship opportunities and shadowing as their top 3 picks (Wood, 2010).

Through work-related experiences gifted students are given concrete opportunities to try out skills and knowledge in their area of strength while also learning new skills that may be outside their comfort zone. Some students may find that not every skill comes easily to them (e.g., working with customers), while others may find that the skills required for a career they thought they wanted they actually abhor (e.g., counting pills, and software programming). Work experience also require students to revisit skills they thought they may have already mastered but are now being stretched or challenged such as organizational skills, time management, and goal setting. Last, gifted students can build new skill sets that K-12 educational systems do not always emphasize such as leadership, team work, self-regulation, initiative, and self-discipline (Greene, 2006).

Performance and Persistence

The SCCT model of performance centers on the idea of attainment of one's educational goals and/or work tasks and their persistence within these tasks. According to this model, SCCT posits that educational and vocational performance is an interaction among one's ability, self-efficacy, outcome expectations, and performance goals (Lent, 2013). Basically, individuals base their self-efficacy and outcome expectations upon the skills and abilities they possess as well as on how well they performed, the outcomes they have received and influence the continued goals they set for themselves. The stronger the self-efficacy and positive outcome expectations the more ambitious goals one sets for themselves which assists to sustain those efforts.

Choice-Making: Ambiguity, Challenge, and Perfectionism. Part of career maturity is the ability to understand that one person cannot know the future, cannot predict the outcome of every choice, and accept that there will be situations beyond their control. Gifted students need to view challenges, failures, and mistakes as a normal part of life not as a critique of their person or their gifts. In addition, gifted students need to be able to open to the emotional experiences that that are connected to challenge and setback such as grief, embarrassment, discouragement, and questioning of purpose and cope with them in a healthy manner (Wood, Smith, & Duys, 2017). Life is messy, so educators of the gifted and helping professionals should normalize the general "messiness" and ambiguity inherent in the career development process. Reflecting on what they have learned from biographies or career genealogies can help gifted students learn how role models and family members have coped with setbacks or times in their lives when job prospects seemed

bleak (Wood et al., 2017). Gifted students can benefit from being able to identify times when their idols or eminent persons in their chosen career domain had to adapt, struggle, and gain resiliencies in order to overcome professional obstacles.

Gifted students who do struggle with tolerating ambiguity or uncertainty may also be wrestling with perfectionism. Wood (2009) found that 96% of the gifted high school students she surveyed indicated that they experienced career-related concerns with the most cited concern being choosing "right" college or career path (47%). In addition, while experiences varied, almost all participants (90%) reported having experienced concerns tied to perfectionism, and 67% specifically cited fear of failing at what they did (Wood, 2009). Unrealistic self-expectations to fulfill perceived potential and unhealthy perfectionism can create obstacles to desired career paths (Jung, 2012; Sampson & Chason, 2008).

Gifted students may delay decision-making regarding colleges or careers for fear of making the incorrect choice (Greene, 2006; Sampson & Chason, 2008). According to Chen and Wong (2013, p. 123) gifted students with unhealthy perfectionistic tendencies, may adopt a "Cinderella-like" fallacy about careers in that they believe "exists only one perfect career for them." Or, in the opposite direction, unhealthy perfectionism can generate a state of hypervigilance in students (Sampson & Chason, 2008). Hypervigilance and a "frenetic and infective exploration" of career information is one way of coping with the anxiety, stress and sense of pressure to choose correctly (Sampson & Chason, 2008, p. 337). Parents who see their gifted students struggle may be tempted to intervene and make the choice for them (Sampson & Chason, 2008) even though coping with struggle is an important life skill. Unhealthy perfectionism that paralyzes can mean that some students lose both time and opportunity to make choices. "By delaying a decision long enough, only one option remains which eliminates the need to choose." (Sampson & Chason, 2008, p. 337)

Hands-On Activities. Educators of gifted students can provide support when students are experiencing anxiety or paralysis in several ways. First, they can provide time for students to explore careers possibilities through websites and other sources. Secondly, it is vital that students are provided time to reflect and discuss with others about potential career pathways. Information about the potential salary, the education necessary, and the work environment are important considerations. During the reflection educators should be attuned to of periods of anxiety, confusion, and unrealistic expectations. They can gently probe for better understanding of what students are thinking and feeling during those times. Educators and parents should stress that both mistake-making and change are normal and are times that require additional reflection about what is important and valuable to individuals (Sampson & Chason, 2008). Gifted students also need to see the difference between making choices and making commitments (Sampson & Chason, 2008) as part of the "messiness" of career development.

Satisfaction and Well-Being

The most recent model of SCCT focuses upon satisfaction and well-being. This model examines the influence of an individual's satisfaction in educational and work pursuits. Satisfaction is seen as the "the degree to which one likes or is happy with one's school or work environment" (Lent, 2013, p. 128). Basically, this model posits that one is more likely to be satisfied with their educational or work pursuits to the extent they are involved with activities they value, making adequate progress toward goals, and have access to the necessary resources to pursue goals. In addition, external factors also play a role in work satisfaction. Such factors that influence work conditions, such as, favorable work environment and perceived organizational support.

Personal Calling and a Quest for Meaning. According to Duffy and Dik (2013, p. 428), while "centuries of wisdom" have seen work as the "finding and living out" of one's personal calling, very little empirical research has investigated this phenomenon prior to 2007. Since that time more research has been generated on the topic which,

in the future, might benefit gifted students. According to these authors, the concept of "calling" includes the following: (a) the calling may come from an "external summons," such as an individual's sense of societal or national need, a family legacy, or a higher power; (b) work as a source of purpose in life; (c) the calling is used to help others, or the "greater good," either directly or indirectly (Duffy & Dik, 2013, p. 429; Duffy & Sedlacek, 2007). They suggested that calling is "an ongoing process rather than something to be discovered once and for all, and proposed that callings often change over time" (Duffy & Dik, 2013, p. 429). In their review of recent literature these authors found that calling was related to confidence in career decision-making, hope regarding the future, academic satisfaction, life satisfaction, and life meaning.

Educators and helping professionals should consider the concepts of personal calling and seeking life meaning when working with gifted students on career decision-making. "A calling to a passion is an important aspect of identity education for gifted youth who seek deep meaning their work because positive work, career and general life outcomes accrue for people who experience their work as a calling" (Hall & Kelly, 2014, p. 41). Because many students demonstrate a heightened sense of moral concern, empathy, and sensitivity toward others they may see choosing a career as fulfilling a personal calling that could possibly work to solve or change "the basic problems of human experience" (Webb, Meckstroth, & Tolan, 1982, p. 183) or to rectify society's wrongs (Greene, 2006; Hall & Kelly, 2014; Muratori & Smith, 2015). Thus, those who see a need for specific job or career may be those individuals who combine their interests and talents in such a way to create or design new careers (Silverman, 1993). In many ways, gifted students are the ones to create new jobs and expand or combine existing fields. For these students opportunities which require them to "spend time observing their environment for things that could be improved and imagine themselves in careers in which they have an opportunity to improve some facet of life," can lead to exploration both talents and interests but also identification of current jobs that need improvement or nuancing (Silverman, 1993, p. 228).

In the end, finding meaning and a personal sense of calling rests on the individual student's values. Jung (2012) suggests that gifted students may encounter the pressure to pursue lucrative or socially prestigious jobs. Conversely, gifted students may prioritize interest and enjoyment over financial gain (Jung, 2013). Kerr (2015) suggests that gifted students may be less concerned about salary and more concerned about life values that may be fulfilled through work; thus she recommends that determining and narrowing values is one of the best ways of helping gifted students select careers that are fulfilling. The Life Values Inventory (LVI, Brown & Crace, 2002), the Values in Action inventory (VIA, Peterson & Seligman, 2006) and the Prefect Future Day scripts an all help students identify and evaluate the specific values that can drive career decision-making (Kerr, 2015). In some cases, a personal calling career (missionary, social work, etc.) can mean high work stress or a less secure financial outlook even if the career requires an advanced degree. Qualities such as grit, perseverance, and a "thick skin" in the face of lack of support or understanding can enable students to choose a more challenging career path in order to fulfill their calling. Students who read biographies of eminent individuals in their profession of calling may find these qualities are learned through difficult circumstances and are hallmarks of eminence (Subotnik, Olszewski-Kubilius, & Worrell, 2011).

Specialized Populations

The idea that one is free to pursue and become anything is an ideal and part of the American dream. With just a desire, drive, and determination the road to a fulfilling and satisfactory career life is just a matter of will. The pathos of the American dream is not always as straightforward or as easy as one would like to believe. Certainly, within certain populations of the USA the gifted and talented individual may face various uncontrollable factors that may impede progress toward goals and at

times even dampen career aspirations and self-efficacy (Greene, 2006). Gifted students who are socioeconomically disadvantaged, who have learning difficulties, who may be a member of a sexual minority, and/or from a minority culture may find various barriers to their career development. These individuals may not always receive the necessary support or challenge that fully prepares them for the career decision-making process (Greene, 2006). This section will explore the nuances of working with gifted and talented students from various special populations.

Gifted and Talented Women and STEM

Literature reviews in gifted education that have focused on gifted women have examined changes in areas such as higher education enrollment, earning of advanced degrees, self-efficacy, attribution style, and STEM engagement (Freeman & Garces-Bascal, 2016; Kerr, 2012; Reis & Gaesser, 2014). Often, researchers point out trends in data from the National Science Foundation (NSF), National Assessment of Educational Progress (NAEP), National Center for Education Statistics (NCES), the Programme for International Student Assessment (PISA), and the Presidential Scholars program. Overall, there has been an upward trend in higher education enrollment, with more women earning degrees in both undergraduate and graduate programs (Reis & Gaesser, 2014). Women are taking more standardized tests and scoring at rates comparable to their male counterparts (Reis & Gaesser, 2014) and are entering the sciences in a variety of sub disciplines (Kerr, 2015). Although trends seem to point to positive increases in many areas, these changes also bring to light new questions.

Interestingly, much recent research has focused upon women in STEM fields. The research on women's engagement in STEM studies is mixed. In 2013, women comprised 29% of the work force in science and engineering (S&E) fields, and 39% of those had an advanced degree (National Science Board (NSB), 2016). Women were employed in higher proportions in social sciences (62%) and life sciences (48%) and relatively low numbers in the following careers: physical sciences (31%), computer and mathematical sciences, and engineering (15%), (25%) (NSB, 2016). Thus, while women are entering STEM areas, they are not entering specific STEM areas in comparable numbers to men. Reasons behind this are nuanced and can include the requirement for advanced degrees, interest in the area, the role of standardized tests, self-efficacy, and decision-making.

Many occupations in STEM areas require advanced degrees beyond the baccalaureate. According to the National Science Foundation (NSF) in 2008, by 2006 half of the doctoral degrees conferred in the biological and agricultural sciences by women as compared to one eighth in 1966. In 1966, 6% of the earned doctorates in chemistry and math, and 3% of doctorates in earth/atmosphere/ocean sciences and physics, engineering and computer science were earned by women. In 2006, 30% of the doctorates in earth/atmosphere/ocean sciences, math and chemistry, and one-fifth in computer science, engineering and physics were earned by women (NSF, 2008). The percent of women earning doctorates in science and engineering fields changed from 38.8% in 2004 to 41.6% in 2014, while the percentage of men dropped slightly from 61.2% to 58.4% (National Center for Science and Engineering Statistics (NCSES), 2017). The Science and Engineering Indicators report, the National Science Board (2016), indicated that in 2013 women earned fewer than one-third of the doctorates that were awarded in computer science, engineering, mathematics or physical science. However, they earned more than half o the doctorates social and behavioral sciences (except for economics, biological, medical, and other health sciences). In fact, the proportions of doctoral degrees earned by women in engineering, computer sciences and physical sciences are higher than in 2000, with the number of science and engineering doctorates earned by women are growing faster than those earned by men (NSB). Trends and patterns are retrospective in nature; they focus on change over time of past generations of gifted women. As Kerr (2012, p. 316)

notes, "little is known about the strengths and the challenges of the current generation of gifted girls." Perhaps one area that should be more carefully explored is interest in and perceptions of STEM majors and fields of study for collegiate women.

The Higher Education Research Institute's study of norms of freshmen in 2016 reported that 94% of freshmen women indicated that they had a GPA of a B or higher (Eagan et al., 2016). Almost 35% took calculus in high school, 22.7 took AP Probability/Statistics, 34% AP Calculus, and 2.9% AP Computer Science, 24.6% indicated a pre-med major pathway (Eagan et al., 2016). However, only 9.5% of freshmen women surveyed indicated biology as a major area of interest, 1.4% computer science, 1.5% math/statistics, and 1.3% chemistry (Eagan et al., 2016). Young women's lack of interest could be tied to their attribution of talent even if their perception does not match the reality based on performance or ability (Freeman & Garces-Bascal, 2016). Self-doubt is part of the human experience; however, men and women may cope with this differently. In one study, while both men and women experienced self-doubt, women in engineering were more likely to look to teachers, professors and advisors for affirmation and increased confidence in their choices (Seron, Silbey, Cech, & Rubineau, 2016). Young women may also see standardized tests as a barrier. While research suggests that the performance gap on standardized tests between men and women has dramatically decreased, young men still score slightly higher than women in many STEM-related tests (Reis & Gaesser, 2014). Young men may also be choosing to take STEM-focused standardized tests more frequently than women, especially in engineering and computer science (American Association for University Women, 2010).

If these women do choose to go on to pursue majors in STEM areas, they may find they are challenged in areas other than course work. First, they will find that because of the lack of women earning doctorates in these areas, their future faculty mentors and instructors will be male, especially in engineering and computer science, and thus lack important same gender mentoring opportunities (AAUW, 2010, 2015). Second, they may find class projects less fulfilling when they are relegated to managerial or secretarial roles (Seron et al., 2016). Third, they may be hired less frequently and paid less than their male counterparts even with the same degrees in the same field (AAUW, 2010, 2015). Last women may also find a mismatch between how they wish to use their talent and interest in STEM and the culture of their preparation programs and work place. In a study of women in engineering, while both men and women performed in math and science in high school and wanted engaging, well-paid future careers, women wanted "to use engineering as a career path to make a difference in people's lives" (Seron et al., 2016, p. 206). Talented women may wish to utilize their abilities toward the greater good or in a way that is more personally satisfying (Freeman & Garces-Bascal, 2016).

SCCT could be utilized in different ways with talented females contemplating the STEM fields. Persistence toward personal goals should play a major role in planning. Women will face obstacles in their path especially if they choose to pursue advanced degrees or careers in specific STEM fields. Planning for an advanced degree requires financial and personal planning. In addition, educators and helping professionals should explore values and meaning early so that gifted women can begin to visualize exactly what they want in a STEM career. If, indeed they wish to work toward solving societal problems, then they will need guidance on how each of the STEM areas in which they are interested and talented can be fitted into more of a humanitarian calling.

Race and Ethnicity

Race and ethnicity often plays a powerful role in our society. For racial and ethnic minority students from underrepresented populations, specifically the underrepresentation of African Americans and Hispanic/Latina(o) students are often faced with additional barriers to academic success (Henfield, Woo, & Bang, 2017). Often, students who are from ethnic minority communities are more likely to experience lower career

aspirations, fewer professional role models, and are less likely to experience educational rigor and challenge (Parris, Owens, Johnson, Grbevski, & Holbert-Quince, 2010). Perceived and actual barriers to career opportunities may dampen and restrict gifted ethnic minority students from reaching their full potential (Henfield et al., 2017; Muratori & Smith, 2015).

Career and academic planning should work together seamlessly for the gifted and talented ethnic minority student. Attention to the academic environment, achievement, and course selection are important considerations throughout a gifted student's academic curriculum. According to Henfield et al. (2017) academic interventions focused at the high school level have been shown to be effective. And while this chapter does not have the space to discuss the achievement gap that exists between ethnic minority children and their white counterparts or lower socioeconomic status children and their middle class peers, the achievement gap may have a powerful effect upon career aspirations and career self-efficacy beliefs (Mitcham, Greenidge, Bradham-Cousar, Figgliozzi, & Thompson, 2010; Parris et al., 2010). For example, Lowered academic performance and achievement in early grades is likely to influence career aspirations and ability to take more challenging course work in high school. In addition, students need to be provided with challenging and intellectually engaging materials to encourage an environment of learning (Henfield et al., 2017) and to clearly understand the relationship between academic achievement and future career opportunities (Parris et al., 2010).

Gifted and talented ethnic and racial underrepresented minority students need to be provided with solid professional career role models in order to assist with goal setting and career aspirations. This may be accomplished through interventions that allow students to explore various careers in which they may not be familiar, immerse students in professional roles, and mentoring programs (Mitcham et al., 2010). Deliberate and contentious efforts should be made to reach out to families. Opportunities to include families in the career development process is important for many cultures. Kenny, Blustein, Chaves, Grossman, and Gallagher (2003) found that when families were included in academic and career planning efforts career aspirations and career expectations increased. This may present a challenge for educators, since parents may perceive the educational system with skepticism and at times hostility (Chung, Baskin, & Case, 1999). Creating relationships with students and their families is essential in order to assist them in reaching their potential.

Counselors working with ethnic and racial minority gifted students need to think holistically in their approach to career and academic planning (Muratori & Smith, 2015). In order to effectively work with this population one needs to have a clear understanding of the community, educational system, and cultural/ethnic identity of the student. As Parris et al. (2010) points out gifted and talented need career services that stress decision-making and examination of contextual factors as well as the individual in a holistic fashion.

Lesbian, Gay, Bisexual, Queer, Questioning, Intersex, and Ally (LBGQQIA) Individuals

In 2011, the National Association for Gifted Children (NAGC) created the LGBTQ Special Interest Group to "encourage research, staff development, advocacy, communication, and collaborative efforts on behalf of our gifted GLBTQ youth, other high-potential students, and the youth whom our students will encounter" (NAGC, n.d.). Both NAGC and the American School Counselor Association (ASCA) have underscored that LGBTQ students frequently confront unsafe school climates, including overt bullying, harassment, and hate speech as well as more subtle messages of discrimination through school "norms" and policies (Kosciw, Greytak, Palmer, & Boesen, 2014). These school climate factors stem from negative school cultures and threaten students' academic, career, and personal-social development. While there has been little research focusing on the experiences of gifted students who also identify as GLBTQ, literature

addressing the academic, personal social, and career needs of GLBTQ students is growing in the field of counseling and psychology. Beck, Rausch, Lane, and Wood (2016) suggest that students who identify as GLBTQ may experience unique barriers in their career and college decision-making which can include (a) prior experiences of discrimination and oppression in their K-12 education; (b) the degree of affirming or nonaffirming educational settings including post-secondary; and (c) safety related issues concerning the coming out experience at work.

For gifted students who also identify as GLBTQ, physical and psychological safety is a paramount issue when considering post-secondary plans. Unlike their non-GLBTQ peers, these students must weigh the relative safety of coming out on their college campuses when considering a good fit between themselves and their chosen university. Recent national surveys have found that high school students who identified as GLBTQ and who experienced high levels of bullying and victimization were twice as likely as to not share their college and career plans than their peers who did not identify as GLBTQ (Kosciw et al., 2014). Not surprisingly, for undergraduate students who identify as GLBTQ, vocational indecision has been correlated with decreased level of social support (Schmidt & Nilsson, 2006). Schmidt, Miles and Welsh (2011) found that for undergraduate college students who identified as LGBT, perceived discrimination and social support were related to vocational indecision and college adjustment. In their study of career and academic choices of college students who identified as GLBTQ, Schneider and Dimito (2010) found that 46% of participants preferred a college environment that was GLBTQ friendly. In the same study 62% of participants reported feeling anxious when applying for a job (Schneider & Dimito, 2010). Educators and helping professionals must be cognizant of services colleges and universities can provide to GLBTQ gifted students beyond just safety. Websites such as campusprideindex.com can help students, parents, and counselors find the optimal fit. Today's gifted GLBTQ students "know now what their predecessors know only in retrospect – that choosing a college that honors both giftedness and sexual-minority status can make a lifelong difference" (Freidrichs, 2012, p. 168).

GLBTQ gifted students also need affirming educational professionals in their lives as well as affirming curricula that is challenging. Both are important to their career development. First "the burden on curricula to help develop self-esteem and knowledge may be even higher with gifted GLBT and other sexual-minority students than with some other groups" (Freidrichs, 2012, p. 167). The 2013 GLSEN national study found that GLBTQ high school seniors were more likely to be interested in STEM areas if courses in high school incorporated positive representations of GLBTQ content (Kosciw et al., 2014). Using visual arts, poetry, or songs, students can imagine and describe what they perceive as their most meaningful or satisfying aspects of potential careers (Beck et al., 2016). Teachers can incorporate GLBTQ role models and persons of eminence in nontraditional occupations in their curriculum (Kosciw et al., 2014). These activities can be supplemented by career programing that incorporates individuals who have nontraditional careers in the local community and through LGBQ invasive career and college readiness fairs, identification of GLBTQ career mentors or potential job shadowing opportunities (ALGBTIC LGBQQIA Competencies Taskforce, 2013; Datti, 2009). The ALGBTIC Competencies for Counseling Lesbian, Gay, Bisexual, Queer Questioning, Intersex, and Ally Individuals (ALGBTICLGBQQIA Competencies Taskforce (2013) suggest that competent counselors - in this case school counselors— can support their GLBTQ students by; a) incorporating identity acceptance and job satisfaction into the student's career decision-making; b) utilitzing career inventories that have been normed for LGBT (and, in this case, adult versions for gifted students); c) and, facilitate students' identification of future barriers to career and lifestyle success and ways to overcome these barriers; d) identify individuals who identify as LGBT that could become mentors in viable career paths; e) help students identify workplaces which are known for safety and inclusivity; and f) discuss the pros and cons to the "coming-out" process to future colleagues and work supervisors.

Conclusion

Career development for the gifted and talented student is a process of discovery of oneself, the world of work and how one wishes to navigate through society. Career development is a complex process that requires both awareness of self (e.g., interests, abilities, and values) as well as examination of external factors (e.g., barriers and opportunities). This process is different for everyone in order to meet the varied needs of students. Approaching career counseling with a one-size-fits-all model does not really work for career counseling for most students and most particularly gifted and talented students. The cornerstone of solid career counseling is time to discuss and reflect, to ponder and dream. To do less than our very best is to limit the potential of our most able in our society.

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19 Ethical and Professional Practice Issues in the Provision of Educational Services to Gifted Students

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Abstract

Using ethical principles for psychologists and school psychologists as a guideline, this chapter discusses the ethical and professional practice issues that may arise when providing educational services to gifted children. Issues related to the varying definitions of "giftedness" and their impact on the identification of gifted children are discussed, as well as considerations for reliable and valid assessments of gifted children. Also included is a discussion of ethical and professional issues to consider when deciding on the most appropriate educational placement for gifted students, given that contemporary definitions of giftedness may not be consistent with a school's curriculum for gifted students.

Historically, discussions regarding what constitutes "giftedness" centered on very superior intellectual ability (e.g., Terman, 1926). However, over the past century new theoretical positions, as well as related discussions regarding "what is intelligence," have emerged in the literature and expanded the definition of giftedness beyond high intellectual ability as measured by an intelligence quotient (IQ) test (e.g., Gardner, 1983; Horn & Cattell, 1966; Kaufman, Kaufman, & Plucker, 2013; Renzulli, 1978; Sternberg, 1984; Thurstone, 1947). This broadened definition of intelligence and giftedness has direct implications on the identification of gifted students, as well as on the provision of gifted education services offered. In this chapter, we discuss the ethical and professional practice issues associated with the provision of cognitive assessment and educational services to gifted children. We first begin with a discussion and commentary on the issues surrounding the definition of the term "giftedness," followed by discussions and commentaries on the ethical and professional practice issues pertaining to the assessment and identification of gifted children, as well as the associated placement and curriculum issues that may arise. The chapter closes with a brief discussion of issues associated with providing counseling services to gifted children.

Definitional Issues

Contemporary definitions of giftedness include references to exceptional abilities in areas that are typically considered to be outside the area of general intelligence, such as leadership potential, creativity, and musical or artistic talents (e.g., McClain & Pfeiffer, 2012; Stephen & Karnes, 2000). For example, the National Association for Gifted Children (NAGC) defines gifted students

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as those who demonstrate superior aptitude (defined as an exceptional ability to reason and learn), *or* superior competence in one or more domains including "any structured area of activity with its own symbol system (e.g., mathematics, music, language) and/or set of sensorimotor skills (e.g., painting, dance, sports)" (p. 1, NAGC, 2010).

These more inclusive definitions are advantageous in that they allow for a wider range of abilities to be assessed by school administrators, educational diagnosticians, and psychologists, and, therefore, provide more opportunities for children with exceptional abilities to be identified as gifted (Pfeiffer, 2013; Renzulli, 2002). However, the lack of quantifiable characteristics and abilities in these expanded definitions can contribute to difficulties with ensuring reliable and valid assessment and identification procedures for evaluating students referred for possible placement in gifted education programs. As a result, professionals (licensed psychologists, school psychologists, school counselors, resource teachers, educational diagnosticians, teachers of gifted students, etc.) who assess and identify students as "gifted" have a responsibility to their school districts, as well as their respective professions and the students that they assess, to use empirically sound (and unbiased) judgment to ensure appropriate identification and educational placement of gifted students.

Gifted vs. Talented

Although many definitions of giftedness use the terms "gifted" and "talented" interchangeably (e.g., Merriam Webster, 2016; NAGC, 2010), others historically proposed to discriminate between the two, with the term *gifted* generally referring to children with very superior academic or general intellectual abilities and *talented* referring to those children with exceptional abilities in other areas such as music or art (see, for example, Cohen, 1981; Gagne, 2012; Sternberg & Davidson, 1986). Combining these two terms into a general category called "giftedness" appears to be more advantageous in our present day complex and technologically sophisticated society, since it permits the identification of more gifted and talented children and provides educational institutions with an increased opportunity to nourish and support the potential of these children.

An inclusive definition may have additional advantages. It may provide more opportunities for placement in gifted programs of children from traditionally underrepresented groups (e.g., Luria, O'Brien, & Kaufman, 2016; Rothenbush, Zettler, Voss, Losch, & Trautwein, 2016; Valdes, 2014). It may also benefit those students who have an exceptional ability or achievement in only one particular academic area and allow, for example, a mathematically advanced student with the opportunity to capitalize on his or her ability by receiving special instruction and mentoring in this area (Callahan, 2005). This more inclusive definition may also allow children or adolescents with exceptional creative or artistic talents the opportunity for additional specialized instruction that would not otherwise be available to them in the regular classroom. For example, because the correlation between creativity and IQ is weak (e.g., Jauk, Benedek, Dunst, & Neubauer, 2013; Kim, 2005), children or adolescents with exceptional creative or artistic talents may be overlooked for gifted education if schools use the more restricted definition that involves only an IQ score.

While a broad definition of giftedness can be advantageous in regard to the accessibility of gifted services, there are also disadvantages to adopting the more inclusive definition of giftedness. For example, although this definition reflects the contemporary scholarly discussions on theories of multiple intelligences, many gifted education programs in school districts across the USA still operate on the premise that very superior general intellectual ability constitutes the basis for placement in a gifted education program (e.g., Gallagher & Gallagher, 1994; McClain & Pfeiffer, 2012). In addition, there is no federal mandate requiring the identification or provision of services for gifted students, so states

and/or school districts vary in their definition of giftedness. Therefore, professionals who evaluate children and/or adolescents for giftedness need to consider the implications of recommending, for example, placement of an average IQ student who qualifies as "talented" within a school district's educational program that operates on the premise that gifted services are for those with very superior general intellectual abilities. Such a recommendation could potentially have negative consequences for some students if they are placed in an advanced academic program that is not well matched to their respective level of academic skill or learning speed (Pfeiffer, 2013).

Students from Minority or Other Underrepresented Groups

Definitional issues regarding giftedness become more complicated when one adds into the discussion issues regarding the identification and placement of students from minority or other culturally diverse groups into gifted education programs. Traditionally, these latter students have been underrepresented in gifted programs (US Department of Education, 2014). There are two common explanations for this underrepresentation. First, the typical process for identifying gifted students generally starts through parent and/or teacher referral, which professionals have argued is a biased process for minority students (e.g., Ford, Grantha, & Whiting, 2008). Research has found, for example, that Asian and Anglo/Caucasian students are more likely to be nominated or referred for gifted education programs than African American and Hispanic students (McBee, 2006). A second explanation is that minority students have been shown to perform more poorly on traditional intelligence tests which, subsequently, could have a negative impact on them meeting a state's or local school district's criteria for placement in gifted education programs (e.g., Giessman, Gambrell, & Stebbins, 2013).

In contrast, the use of the more inclusive definition of giftedness could provide students from minority or other more traditionally underrepresented groups with an increased opportunity for placement in giftedness classes. In addition, the use of this inclusive definition appears to encourage the exploration and use of alternative assessment methods for the placement of students (e.g., Pfeiffer, 2015). For example, in the case of non-native English speaking children or underachieving native English speakers, nonverbal measures of intelligence are increasingly being used to ensure an unbiased assessment of students who are referred for possible placement in gifted education (Naglieri & Ford, 2003, 2005, 2015).

Commentary

Given the advantages and disadvantages of differentiating between gifted and talented students, it is our opinion that professionals who assess and identify gifted and talented individuals have an ethical responsibility to maintain current knowledge of the research and practice literature in this area. They also have an ethical responsibility to be familiar with ongoing discussions of policy matters and definitional issues in the scholarly literature that may impact their assessment practices and subsequent identification of students for placement in gifted education programs. This ethical responsibility also includes staying up-to-date on the current literature on the measurement of creativity and other talents related to giftedness, as well as maintaining one's knowledge of (and training in) new procedures for assessing and identifying giftedness. For example, recent research has suggested that relying on universal screening rather than teacher referral can increase the number of minority students who ultimately qualify for a gifted education program (Card & Giuliano, 2016).

We further believe that it is the responsibility of those professionals conducting student evaluations for placement in gifted programs to inform school policy decision-makers regarding the current knowledge in the scholarly literature regarding the assessment, identification and placement of students in gifted education classes.

In addition, consistent with the ethical principles and code of conduct of the American Psychological Association (APA, 2010) and the National Association of School Psychologists (NASP, 2010), it is our opinion that these professionals have an ethical responsibility to work in the best interests of a child or adolescent whom they are evaluating for giftedness and, therefore, must be able to consider the options that are available to that student following an evaluation. Specifically, these professionals must be sensitive to the social and emotional implications of each option on a child's or adolescent's overall well-being, and each option needs to be thoroughly considered before the professional agrees to advocate for a child's placement in a gifted program.

In addition, we believe that these professionals have an ethical obligation to those being evaluated that they have had the appropriate education, training, and supervision in the assessment, identification, and placement of students in gifted education. They should also be prepared to provide documentation that they have had appropriate education and supervised training in the provision of competent (and culturally sensitive) gifted assessment and evaluation services to students from minority and/or other traditionally underrepresented groups, and that they are competent to participate in the subsequent decision-making regarding placement of these students. Demonstrating such competence and cultural sensitivity and respect may include documentation of the following: (1) supervised training in the assessment and evaluation of students from culturally diverse groups that are represented in a professional's school district; (2) course work on "evaluator bias" in assessment and "item bias" in assessment instruments; (3) knowledge of the definitions of giftedness in different cultures and how this may impact a child's performance in a school that is not representative of the child's culture; (4) awareness of one's own cultural bias and how this may influence the assessment process; and (5) knowledge of various gifted assessment instruments and ability to provide an accurate, objective, standardized assessment of a child.

Assessment and Identification Issues

In 2003, Pfeiffer conducted a study in which 64 professionals and experts in the field of giftedness were surveyed regarding their opinions of the most prevalent issues in the field. In the category, "Identification and Assessment Issues," the top responses included there being a lack of consensus on how to define gifted and talented. A review of the literature over a decade later shows a similar pattern in that there is a considerable amount of research discussing assessment and identification issues. This lack of definitional clarity leads directly to difficulties in the reliable and valid assessment and identification of giftedness and raises several ethical issues for professionals who conduct evaluations of giftedness.

Although many professionals who conduct these evaluations are not necessarily certified school psychologists or licensed psychologists, it is our position that all professionals who conduct these evaluations or participate in placement decisions are ethically and morally bound to provide competent identification and assessment services in determining which students qualify for gifted education services. In this regard, Table 19.1 lists several areas of ethical practices that we feel professionals need to be sensitive to and self-monitor. These areas of ethical practices are derived from the ethical principles of the APA (2010) and the NASP (2010) regarding the delivery of psychological services to the public. It is our position that these principles should also guide professionals who provide educational services to students in the area of giftedness.

In terms of *bases of assessment,* professionals should be certain that there are a sufficient number of assessment instruments available to (1) permit the conduct of a thorough giftedness evaluation of a referred student, and (2) allow for the formation of an unbiased conclusion regarding whether the student qualifies for a gifted education program. In addition, the assessment instruments available must be able to generate sufficient data for the professional to formulate an unbiased conclusion regarding the referred student.

Table 19.1 Ethical practice domains in the assessment of giftedness and the corresponding ethical practices that have been adapted and derived by the authors from the ethical principles and code of conduct of the American Psychological Association (2010) and National Association of School Psychologists (2010)

Ethical practice domains	APA-derived ethical practices	NASP-derived ethical practices
Assessment		
(a) Bases of assessment	Assessment work is based on a sufficient amount of valid and reliable techniques to substantiate one's findings; make opinions only if an adequate examination supports the statement or conclusion	Based on valid, reliability, and up-to-date instruments that are applicable and appropriate for the benefit of the child; multiple assessment methods are used to reach a conclusions
(b) Use of assessments	Use assessment instruments which have been empirically validated to be reliable, valid, and appropriate for the assessment; if this is not possible the limitations must be discussed. Assessment methods must be used that are language appropriate unless the use of alternative languages is relevant to the assessment issues	Chose those instruments and techniques that have up-to-date standardization data and are applicable and appropriate for the benefit of the child; select and use appropriate assessment and treatment procedures, techniques, and strategies; use those assessment and intervention strategies that assist in the promotion of mental health in the children they serve
(c) Interpreting assessment results	Take into account various test factors including situation, personal, linguistic, and cultural difference that may affect one's judgments or reduce the accuracy of their interpretations, and indicate significant limitations of their interpretations	Respect differences in age, gender, sexual orientation, and socioeconomic, cultural, and ethnic backgrounds; decision-making is primarily data-based; intervention is appropriate and consistent with data collected
Unfair discrimination	Do not engage in unfair discrimination based on age, gender, gender identify, race, ethnicity, culture, religion, sexual orientation, national origin, disability, or socioeconomic status	Recognize that individual bias or that seen in the techniques and instruments used for assessment and intervention may include racial, class, gender, and cultural biases that may affect decision-making, and work to reduce and eliminate these biases where they occur
Competency		
(a) Boundaries of competence	Provide services only within the person's boundaries of competence, based on their education, training, supervised experience, consultation, study, or professional experience	Recognize the strengths and limitations of one's training and experience, engaging only in practices for which they are qualified
(b) Maintaining competence	Maintain an ongoing effort to develop and maintain competence	Engage in continuing professional development, remaining current on research, training, and professional practices
(c) Bases for scientific and professional judgment	Work is based upon established scientific and professional knowledge of the discipline	Decision-making is primarily data-based
Avoiding harm	Seek to safeguard the welfare of those served; take care to do no harm	Advocacy—support options that are in the best interest of the child
Placement and curriculum issues	Base placement and curriculum decisions on scientific and professional judgment	Placement decisions primarily scientific and data-based
Intervention	Provide counseling services only within one's boundaries of competence	Use intervention and therapy techniques that the profession considers to be responsible, research-based practice

With regard to the *use of assessment instruments*, professionals should be certain that the assessment instruments that are available for the evaluation have been empirically verified regarding score reliability and test validity. In addition, the professional should make sure that the norming group used in the validation of the assessment instrument also included a sample of children or adolescents who were of the same age, ethnicity, culture, and gender of those students who have been referred for a giftedness evaluation. Furthermore, those who conduct giftedness evaluations should be certain that, in all cases, the most recent edition of an assessment instrument is being used and that a "reasonable person" would conclude that the standardized conditions for administering the assessment instrument are consistent with those conditions under which a child or adolescent is currently being assessed.

Professionals who assess students for giftedness should also be sensitive to the "Flynn Effect" (Trahan, Stuebing, Fletcher, & Merrill, 2014). This refers to the tendency for there to be a systematic rise in IQ scores over the years and across the world; therefore, it may be problematic to compare the scores obtained in a particular assessment with those of the IQ comparison group or normative group if the norms are outdated or many years have passed since the assessment instrument was standardized or restandardized. Specifically, if a student is assessed for giftedness shortly after a test is first standardized, then her or his score will be x; however, if the same person is tested many years after the test has been standardized (with years being represented by y), then his or her real score on the second test will be $x + y = z$. As time passes, therefore, there is an increased likelihood that the person will score higher on the test, prompting a possible conclusion about his or her abilities or achievement level that is more likely to be due to *measurement error* than reflecting a true indication of the person's higher ability or achievement level (see for example Kanaya, Ceci, & Scullin, 2003).

A related potential problem in the use of normed assessment instruments is that of *standard error of measurement*, or the possibility that a person's "true score" on a test is not the "actual score" he or she received; rather, the true score lies some where within a specific range of possible scores she or he could have obtained (e.g., Reynolds, Livingston, & Willson, 2008). In this regard, most IQ test scores have a standard error of measurement at a 95% confidence interval of about plus or minus 5 or 6 IQ points around the actual score that the person received. For example, the *Wechsler Intelligence Scale for Children, 5th Edition* (WISC-V; 2014), a widely used test of intelligence for determining giftedness, has a standard error of measurement of plus or minus 5 points at a 95% confidence interval. If a particular state or school district uses, for example, a strict IQ cut-off score of 130 as its criterion for gifted education placement, a student who obtains a WISC-V Full Scale IQ score of 128 would probably not qualify. However, based on standard error of measurement, there is an equal chance that the next time the same student is tested she or he will receive an IQ score that ranges between 123 and 135. Similarly, a student who scores 130 on the WISC-V at one point in time could score on the next retesting somewhere between 125 and 135. This suggests that professionals who evaluate students for giftedness need to take into account standard error of measurement when forming any conclusions in regard to whether a particular student qualifies for a gifted education program. It also suggests that these professionals should not rely on only one assessment instrument to form a conclusion regarding whether a particular student qualifies or does not qualify for placement in gifted education.

Professionals who assess gifted students should also *use a test that is language appropriate* for the student being evaluated. This may mean using a test or other assessment instrument that is in the child's primary language and having the test administered by an evaluator who is fluent in that language. This ethical practice also means that if an assessment instrument is not available in the student's primary language, then the professional may need to arrange for the administration of a nonverbal test. If, on the other hand, the student is fluent in English but is not from America, the professional conducting the

assessment should be sensitive to potential variations across countries in the use of language (e.g., the differences between American and British English regarding word usage or meaning of phrases), and how these differences may contribute to possible scoring bias on the test—for example, using a test that was normed specifically on American children for students whose families recently immigrated to America from other English-speaking countries such as Australia, New Zealand, and UK, or immigrated from countries where English is one of the official languages such as India, Kenya, Nigeria, Nigeria, the Philippines, and Sri Lanka

In addition, professionals who conduct these assessments should recognize that there are also cultural differences within groups that speak the same language, and that these differences may contribute to bias in scoring when, for example, the cultural background and experiences of the student being evaluated are different from those children in the norming group. These differences and subsequent scores on the assessment instrument may affect the validity of the assessment results, and therefore, this should be noted as a limitation of the results in the professional's report about the student (Harris, Graves, Serpell, & Pearson, 2013; Weiss & Rosinski, 2016).

With respect to *interpreting assessment results*, it is the responsibility of professionals who evaluate students for giftedness programs to take into consideration many factors when forming conclusions regarding whether particular students qualify for placement in a gifted program. For example, such situational factors as noise level in the test room (and outside of the testing room), as well as temperature and lighting levels in the room need to be considered as possible threats to the validity of the results and related conclusions. The motivation level of the student and his or her level of distractibility and ability to follow instructions also need to be considered. Research further suggests that there are examiner issues that need to be considered, as they may impact the validity of particular interpretations or conclusions. Examples include ethnic matching of an examiner or socioeconomic status differences between the examiner and the person being tested (Flanagan & Harrison, 2012).

With regard to identification issues, as Table 19.1 suggests under *unfair discrimination*, decisions regarding whether a student qualifies for a gifted education program should be based on objective data and not influenced by such issues as the student's age, gender, sexual orientation, cultural background, ethnicity or race, or family background. This means that professionals should use empirically validated techniques and instruments that have been shown to be reliable and valid in assessing the gifted population. This is necessary to ensure accurate identification and placement of a child in a gifted education program. Unfortunately, the lack of consensus on the definition of giftedness has resulted in a corresponding lack of clarity when choosing empirically supported instruments. To compensate, the limitations of an assessment procedure should be stated by the professional and taken into consideration during discussions concerning placement. In addition, it might be best for professionals to use multiple assessment instruments and methods to help ensure a broader-based assessment for giftedness. This is particularly important when assessing minority children, because many instruments are not adequately standardized on minority populations, particularly those minority students who are gifted. As a result, these instruments may contribute to the misidentification or lack of identification of gifted students who are from minority populations (Pfeiffer, 2013).

In addition to conducting assessments in an unbiased and fair manner to help offset the underrepresentation in gifted programs of students from various minority populations, it is also important that those professionals who conduct evaluations in this area maintain an ethically sound practice based on the current scientific literature. Difficulties may arise, however, when it is clear that identification bias exists in certain school district policies, such as when a school district routinely makes giftedness placement decisions regarding students based solely on IQ scores from standardized intelligence tests without taking into consideration the student's ethnic, cultural and/or

racial background. For example, research has historically showed that an IQ score of 130 is two standard deviations above the norm for Caucasian and Asian American students on standard cognitive ability tests but it is three standard deviations above the norm for African American students (e.g., Roth, BeVier, Bobko, Switzer III, & Tyler, 2001). This suggests that in order to qualify for gifted education placement, African American students would need to have an IQ score that is at least one standard deviation higher than the standard deviation values used for their Caucasian and Asian American regular education peers.

Given that many current assessment techniques and instruments in the area of giftedness may not provide accurate data for those students who are not representative of the majority culture or ethnicity, a trend has emerged in the literature that encourages the use of alternative assessment procedures (e.g., NAGC, 2008; Pfeiffer, 2013; Valdes, 2014; VanTassel-Baska, 2007). Alternative assessments may include performance-based assessments (e.g., *Screening Assessment for Gifted Elementary Students*), nonverbal intelligence tests (e.g., *Naglieri Nonverbal Ability Test*), talent identification models (e.g., *Differentiated Model of Giftedness and Talent)*, product creativity (e.g., student writing samples or storytelling), and student/parent/teacher interviews. The use of these alternative assessments aids in the provision of unbiased educational services, helping professionals who evaluate students for giftedness to avoid discrimination, and use assessment instruments that are tailored to the child being evaluated. The NAGC (2008), for example, has acknowledged the integral role of formal assessment in the identification of gifted students but asserts that the assessment should include a variety of assessment practices in order to help decrease bias. However, although alternative assessments help to provide an unbiased assessment of a student's abilities, there are some disadvantages associated with these techniques. For example, there is limited evidence available in the research literature on the reliability and validity of some of these techniques, with a few studies suggesting the presence of poor inter-rater reliability and unclear scoring procedures (e.g., Johnsen, 2003; NAGC, 2008).

Commentary

If a professional who evaluates a student for giftedness uses alternative assessment measures without specifying the limitations of his or her findings, then the person could be construed as not being competent in providing the professional evaluation. Similarly, if a professional uses a well-established assessment instrument on a student who is not representative of the norming group for that instrument, then this, too, could be construed as not providing competent assessment services. The reason for this is that professional associations such as the APA and NASP, as well as the general public and consumers (i.e., students and their parents) expect professionals who conduct giftedness evaluations to provide services that are based on scientific and professional knowledge regarding test construction theory and standards of practice.

In addition, the presumption is that those professionals who provide these assessment services are competent by virtue of their education and supervised training in the area of giftedness evaluations. If the professional standard of practice is to use only reliable and valid assessment instruments, base placement decisions regarding giftedness on reliable and valid data, and specify the limitations of one's findings, then a professional may not be practicing in a competent manner if these latter standards are not being followed. Similarly, if the professional has not had the proper education and training in the assessment and evaluation of giftedness, as well as in the identification and placement of students in gifted education programs, then he or she may be construed as providing a service outside of his or her area of competency. In this regard, certain professionals may need to refer a student to another professional for an evaluation until he or she has had adequate supervision, training, and/or experience in working with a specific student population. It is, therefore, necessary that people who assess students for giftedness recognize their strengths and limitations in their experience with the gifted student population, and use professional judgment when deciding whether they are qualified to provide an accurate assessment. If an accurate assessment cannot be provided, but the

evaluation nevertheless takes place, then the professional who conducts the assessment must state the limitations associated with her or his findings.

Placement and Curriculum Issues

A fundamental goal of most gifted education programs is to provide students with an opportunity for learning that addresses their unique needs and abilities by engaging them in a curriculum that is both stimulating and challenging, and enhances their development (US Department of Education, 2014). In addition, school districts often employ teachers in their gifted education programs who are trained specifically to work with gifted children. These programs also often provide gifted students with individualized tutoring, accelerated coursework or classroom placement, after-school programs, and the opportunity to interact with intellectually equal and/or similarly talented peers (NAGC, 2017).

While most would agree that all students should be offered high quality education with various learning opportunities, experts in the field of gifted education argue that gifted students in particular need specialized programs in order to help them meet their full potential. The National Research Center on the Gifted and Talented funded several studies in the 1990s (e.g., Archambault Jr. et al., 1993; Westberg, Archambault, Dobyns, & Salvin, 1993) that first empirically supported the notion that the regular education classroom may not be challenging enough for gifted students. Subsequent studies have indicated that gifted and talented students may become bored with an unchallenging curriculum in a regular classroom, and that this situation may lead to a lack of motivation or interest in academics and/or in average or below average performance in school, behavior problems, and/or truancy (Cavilla, 2017; Nandis & Reschly, 2013; Van der Meulen et al., 2014; Vogl & Preckel, 2013). Placement of these children in a more stimulating and challenging curriculum may alleviate these potential difficulties. In addition, for those gifted and talented students who may feel socially isolated in their regular education classroom, placement in a gifted program may facilitate their social development because it will foster interactions with other students at their intellectual or cognitive level, not just at their grade level (Cavilla, 2017; Colangelo, Assouline, & Gross, 2004).

Although placement in a gifted education program may be beneficial for many gifted and talented students, it should be pointed out that there may be some disadvantages associated with such placement. For example, a gifted curriculum generally includes accelerated coursework and a heavier workload than typically found in a comparable regular education classroom. Many of these programs require a commitment from the student, particularly in the higher grade levels, and a willingness to dedicate the time and energy needed to complete school assignments. If a student does not have the motivation to adjust to this change in classroom structure and teacher expectations, academic failure may result (Ford, Moore, & Harmon, 2005; Rollins & Cross, 2014). This is especially important to consider given that not all research shows that being in a gifted program is always advantageous for higher achievement. For example, a group of researchers examining achievement of students who attended an elite gifted and talented school found no negative effects of participating in the gifted program, but also found very few short-term advantages (Bui, Craig, & Imberman, 2014).

Commentary

Given the potential advantages and possible disadvantages of placing a student in a gifted and talented education program, professionals who are involved in making placement decisions have an ethical and professional responsibility to remain current in the scholarly literature pertaining to placement decision-making. This responsibility also includes being cognizant of the current research and scholarly literature addressing the best type of placement for students (acceleration, tutoring, peer mentoring, individual instruction, etc.) and the literature pertaining

to the social, emotional, and academic implications of placing students—particularly those from underrepresented groups—into gifted and talented education programs.

Professionals in this area have an obligation to work in the best interests of those students whom they are considering for placement. It is therefore important that these professionals have sufficient knowledge of the social and emotional development of students being considered for placement, as well as their motivational levels, to ensure that placement is the appropriate choice. Moreover, with regard to placement decisions for students from culturally diverse groups, it is the responsibility of those professionals making these decisions to consider the academic and psychosocial needs of the students. As Callahan (2005) has indicated when making placement decisions regarding underrepresented students, failure to consider their individual educational needs is to "engage in educational malpractice" (p. 103).

Counseling Issues

In addition to the many unique challenges facing professionals in accurately identifying, assessing, and making placement decisions regarding gifted and talented children, challenges are also faced by those professionals who provide mental health counseling services to these children and their families. Although there is a paucity of research in the areas of gifted student counseling and the counseling of families having a gifted student, the available scholarly literature suggests that in comparison to the general student population gifted children present unique characteristics, stressors, and needs that should be considered in counseling (e.g., Preckel, Baudson, Krolak-Schwerdt, & Glock, 2015; Renati, Bonfiglio, & Pfeiffer, 2016; Riedl-Cross & Cross, 2015). For example, gifted children have been shown to be at a greater risk of certain emotional difficulties, such as perfectionism, anxiety, depression, and suicidal ideation (Riedl-Cross & Cross, 2015). They also have many common personality style characteristics that may lead to social interaction problems, with the most common characteristics being perfectionism, excitability, questioning of authority, heightened sensitivity, intensity, and a desire for recognition in their environment (e.g., Lovecky, 1992; Silverman, 1993).

A variety of difficulties may occur in the lives of these students as a result of the presence of the personality style characteristics described above. For example, these students could feel detached, isolated, or rejected from their respective non-gifted peers; develop externalizing or internalizing behavioral or emotional problems; have low tolerance for frustration; become underachieving in school; and have feelings of conflict and related stress between achieving certain academic goals versus having one's social interaction needs met (e.g., Eklund, Tanner, Stoll, & Anway, 2015; Lee, Olszewski-Kubilius, & Thomson, 2012; Stopper, 2013; Yoo & Moon, 2006). These unique personality style characteristics and potential social/emotional difficulties should be taken into consideration when determining whether a particular child is in need of counseling services, and what the most effective counseling approach might be with this person.

The presence of these personality characteristics and possible social/emotional difficulties in a gifted or talented child may also negatively influence his or her family's functioning and related interactions between family members. This situation could also lead to distress among family members, and such distress needs to be taken into consideration when a gifted student is seen in counseling (Renati et al., 2016). Other issues that may impact a gifted child's psychological well-being are having parents who may misunderstand giftedness, have unrealistic expectations about their child's ability or talent, and/or be overinvolved with their child's education. There may also be power struggles between a parent(s) and the gifted or talented child, and problems with sibling rivalry—particularly if the sibling(s) is of average ability (Renati et al., 2016). In such cases, parent education and/or family therapy may be necessary (Stopper, 2013; Weber & Stanley, 2012).

Commentary

Given the possible unique counseling needs of gifted and talented children and their respective families, as well as the ethical responsibilities of counselors and other mental health professionals who provide counseling services to these students, it is important that these professionals work in the best interests of the child. The general public also expects the counseling professional to be competent and knowledgeable not only in the delivery of counseling services but also in providing such services to gifted children and their families. In this regard, school-based counseling professionals should be cognizant of the major social, emotional, familial, and academic issues that typically confront gifted children and their families, and be familiar with the various therapeutic techniques that have been shown to be useful with these children. If, on the other hand, a school-based counseling professional does not feel adequately trained or knowledgeable in this area, then he or she should refer the child and/or family to a mental health professional in the community who is skilled in providing such counseling or therapy services. Related to this, the school-based counseling professional is also under an ethical and professional obligation to stay current regarding the scholarly literature surrounding the social, emotional, familial, and academic challenges that gifted and talented children encounter, as well as the various counseling techniques and methods that have been shown to be effective with this population.

Summary and Conclusions

In this chapter we reviewed the various ethical and professional issues that may arise in the delivery of services to gifted and talented students. One of the first issues that is addressed involved the definition of giftedness, and how there has been a trend toward broad definitions to include students of exceptional abilities other than high intelligence. While expanding the traditional definition of giftedness is congruent with a modern understanding of individual differences, doing so has led to ethical issues in the assessment and identification of gifted students (i.e., problems with reliability and validity in the assessment methods being used). It has also brought into consideration issues associated with the placement of students in gifted education programs, as well as the type of curriculum provided to these students, who may not fit the traditional definition of giftedness since many gifted programs are founded on the notion that giftedness implies having a high IQ. Therefore, professionals who evaluate the latter students must be sensitive to the various ethical and professional issues that may arise when providing assessment, identification, and placement services to them. Professionals also need to be sensitive to the unique social, emotional, familial, and academic issues that may occur in gifted and talented children. Awareness of these issues is particularly important if gifted or talented students are referred for mental health counseling services, as they may require a different therapeutic approach and require a therapist who is trained in and competent to work with these students.

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20 Identifying and Providing Evidence-Based Services for Twice-Exceptional Students

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Abstract

Twice-exceptional students have complex cognitive, academic, and psychosocial profiles that present challenges to identification and intervention practices. A high ability student's disability or mental health diagnosis may go unidentified; a student's talent domain may go unnoticed as they receive disability accommodations; or a student's ability and disability may mask each other, resulting in neither being acknowledged. Most of the extant research literature has focused on identifying twice-exceptional students' cognitive and academic profiles, potentially at the expense of examining their behavioral, social, and emotional strengths and areas for growth. Comprehensive assessment of all domains is needed to guide appropriate interventions. There are few individual, group, and school-based empirically validated interventions for twice-exceptional populations, yet best-practice guidelines exist within the clinical psychology, special education, and gifted education literatures. Educators and mental health professionals should consult these resources while considering ability and disability among the numerous contextual factors that influence a child's presentation. To improve services for twice-exceptional students, we recommend increasing professional development opportunities regarding twice-exceptional students' presentations and multifaceted needs; adapting for twice-exceptional populations current empirically supported treatments; assuming a strengths-based perspective where talent development is regarded first; and disseminating resources about twice-exceptionality to parents, school personnel, and mental health providers.

Twice-exceptional students, or those identified as having one or more talent and disability domain, are increasingly recognized in clinical and educational settings. It is challenging to know how many twice-exceptional students exist for a variety of reasons, such as misdiagnosis and misidentification (Pfeiffer, 2013) and variable educational definitions of high ability (McCallum et al., 2013). A recent study (Barnard-Brak, Johnsen, Hannig, & Wei, 2015) found 300 of the over 13,000 children with an identified disability in their sample scored in the 90th percentile or above on a norm-referenced achievement test,

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but only 11% of the 330 children participated in gifted and talented programming. Proper identification therefore remains a priority. Additionally, many scholars have written about twice-exceptional students' educational and psychological needs, however, less attention has been paid to identifying and employing empirically validated treatments. Also well documented is a dearth of research with this specific population, making application of evidence-based services identified within other disciplines, such as child clinical psychology, worth considering within the context of the students' high ability domains.

Researchers in the field of gifted education generally conclude high ability students are typically well adjusted (Neihart, Pfeiffer, & Cross, 2015); despite pop psychology or mythology, there is no evidence of greater psychopathology among the gifted. Instead, it is likely mental health concerns exist at the same rate among high ability youth as in the general population (Cornell, Delcourt, Bland, Goldberg, & Oram, 1994; Garland & Zigler, 1999). This means high ability children can and do have educational and/or mental health diagnoses that require intervention. To begin this discussion, we review the relevant theoretical foundations that will guide our inquiry into evidence-based identification of and treatment for twice-exceptional students.

Theoretical Foundation

The talent development mega-model (Subotnik, Olszewski-Kubilius, & Worrell, 2011) considers fostering high ability in light of five core principles: abilities matter and can be developed; talent development trajectories vary via domain; opportunity matters; psychosocial factors impact talent development success; and "eminence is the aspired outcome of gifted education" (Subotnik et al., 2011, p. 4). Applying this model to the twice-exceptional student, ability identification, opportunity, and psychosocial functioning all may be impacted by the presence of a disability. In fact, a comprehensive evaluation of the students' abilities and disabilities, and exploring their social, emotional, cognitive, and academic presentation within the context of their diagnosis, is recommended (Foley-Nicpon, Assouline, & Fosenburg, 2015; Pfeiffer, 2013). Therefore, Bronfenbrenner's Bioecological Systems Theory, which highlights the complexity of individual and environmental differences, seems appropriate when exploring evidence-based interventions for twice-exceptional students (Besnoy et al., 2015). This bioecological model is a holistic approach toward understanding child development and potential, emphasizes the interactive and synergetic nature of relationships, and considers biopsychosocial and cultural factors in child development (Bronfenbrenner, 2005).

Bronfenbrenner viewed human development as an ongoing and lifelong process resulting from the interaction between individual characteristics and environmental/contextual conditions (Bronfenbrenner, 1977). The original theory posits a hierarchy of interlocking systems that influence human development: the *microsystem* (i.e., individual), the *mesosystem* (e.g., family, school environment, peers, and religious/spiritual institutions), the *exosystem* (e.g., extended family members, social welfare, neighbors, and mass media), and the *macrosystem* (e.g., ideologies and attitudes; Bronfenbrenner, 2005). Starting in the 1980s, Bronfenbrenner modified his theory to include proximal processes, or actions that happen because of the relationships within systems that vary according to the individual and his/her context (Bronfenbrenner & Evans, 2000; Darling, 2007; Tudge, Mokrova, Hatfield, & Karnik, 2009). For instance, a twice-exceptional student is viewed as having genetic potential, which can only be activated by experiencing *proximal processes* through engaging in interactions or activities (e.g., learn how to play the piano) with someone in their immediate proximity (e.g., her sister) on a regular basis. Additionally, individual characteristics one possesses during interactions with the social environment include *demand* characteristics (e.g., age, gender, skin color, physical appearance), *resource* characteristics (e.g., past experiences, skills, social and material resources, family dynamics), and *force* characteristics (e.g., motivation, persistence, and/or temperament; Tudge et al., 2009). To illustrate, two 11-year-old (*demand*) twice-exceptional students both living

with intellectual giftedness in verbal reasoning and attention-deficit/hyperactivity disorder (ADHD; *resource*), from the same neighborhood and apartment building (*resource*), with fluctuating motivation (*force*), would have different developmental trajectories. Finally, Bronfenbrenner considered time, or the *chronosystem*, as the fifth system in his model. The importance of various systems varies depending on the child's age and developmental stage, and the composition of proximal and distal risk factors varies across generations (Bronfenbrenner, McClelland, Wethington, Moen, & Ceci, 1996).

Considering both the Talent Development Mega-Model (Subotnik et al., 2011) and the bioecological model (Bronfenbrenner, 2005) suggests the importance of sociocultural and historical factors that influence ability identification, opportunity, and psychosocial skill development among twice-exceptional students. We can consider these factors in terms of the relationships between learners, educators, parents/guardians, communities, and/or immediate and indirect sociocultural contexts, as well as the histories in which they are situated (Stack, Sutherland, Smith, & Tungaraza, 2016). Given these complexities, identifying students who are twice-exceptional is an important first step in deciphering what interventions best address students' talent and disability domains.

Identifying Twice-Exceptionality

Twice-exceptional students are those identified as gifted/talented in one or more domains (e.g., mathematics, science, social arts, and visual and performing arts), and who simultaneously possess one or more disabilities (Assouline, Foley-Nicpon, & Huber, 2006; Assouline & Whiteman, 2011; Foley-Nicpon, Allmon, Sieck, & Stinson, 2011; Moon & Reis, 2004; Reis, Neu, & McGuire, 1997). One challenge with identification is the camouflaging and/or masking of exceptionalities because disabilities and abilities can conceal each other (Brody & Mills, 1997; Dare & Nowicki, 2015a, 2015b; Foley-Nicpon, Assouline, & Colangelo, 2013). In schools, high ability is commonly defined as performing in the top 2–5% among one's peers in one or more academic or ability domain and/or through grades (Antshel et al., 2008). This may mean that students with talent in a specific doman, rather than globally based high ability, may fail to meet the criteria for identification as gifted (Baum & Owen, 1988; Ferri, Gregg, & Heggoy, 1997; Foley-Nicpon, Assouline, & Stinson, 2012; Foley-Nicpon, Rickels, Assouline, & Richards, 2012). Furthermore, high ability students with disabilities may not be nominated for gifted education programming. Rinn and Nelson (2009) provided 132 preservice teachers with a vignette of an unidentified student with both gifted and ADHD characteristics. Participants identified ADHD behaviors more easily than gifted behaviors. When presented with the suggestion of giftedness and ADHD, participants often ignored the gifted behaviors and solely focused on ADHD symptomology.

Twice-exceptional students can be unidentified and/or misdiagnosed in three ways: (1) students identified as gifted, but their disability and/or diagnosis is unidentified; (2) students identified as having a disability and/or diagnosis, but their talent domains are unrecognized; or (3) both the students' talent domains and disabilities are not identified (Brody & Mills, 1997; Dare & Nowicki, 2015a, 2015b; Foley-Nicpon et al., 2011; Reis, Baum, & Burke, 2014). Missed or misdiagnosis can be associated with adverse outcomes in academia (Bees, 2009), social isolation and low self-esteem (Assouline & Whiteman, 2011), and depression, anxiety, or withdrawal (Bees, 2009). Some researchers have suggested students may underachieve (Foley-Nicpon & Assouline, 2015; Reis & McCoach, 2002) and have poor self-awareness and self-concept (Assouline & Whiteman, 2011; Foley-Nicpon et al., 2011; Reis et al., 1997). However, thus far in the research literature, more attention has been focused on cognitive elements of twice-exceptionality (Assouline, Foley-Nicpon, & Dockery, 2012; Assouline, Foley-Nicpon, & Whiteman, 2010; Foley-Nicpon, Assouline, & Stinson, 2012), than on social and emotional elements (Foley-Nicpon, 2015) that may benefit

from psychological intervention. Distinguishing between a chronic underachiever and a gifted student who has behaviorial or emotional concerns is critical as the intervention appropriate for each subgroup may be radically different (Eklund, Tanner, Stoll, & Anway, 2015). Accurate identification of behavioral and emotional problems among high ability students is needed to help guide appropriate interventions. The three disability domains most often researched among high ability students include ADHD, autism spectrum disorder (ASD), and specific learning disability (SLD).

High Ability with ADHD

ADHD, one of the most common childhood disorders occurring in 2–16% of the population (Biederman, 2005; Cormier, 2008), can manifest among high ability students (Neihart, 2008). It is defined as a chronic and pervasive disorder where inattention, hyperactivity, and impulsivity symptoms are present in more than one environment and negatively impact functioning (American Psychiatric Association (APA), 2013). Among high ability students, the focus may be on remediating ADHD symptoms rather than talent development due to a pressing need for treatment (Foley-Nicpon et al., 2011; Reis et al., 2014). Compared to high ability children without ADHD, high ability children with ADHD report a lower self-esteem, overall happiness, and behavioral satisfaction (Foley-Nicpon, Assouline, & Stinson, 2012; Foley-Nicpon, Rickels, et al., 2012). Behaviorally, they present with academic difficulties, disruptive behaviors, and often a family history that is similar to that of average students with ADHD (Assouline & Whiteman, 2011). They also may struggle with managing long-term projects (Moon, Zentall, Grskovic, Hall, & Stormont, 2001; Zentall, Moon, Hall, & Grskovic, 2001). The overlapping symptoms among high ability and ADHD make it critically important that educators and parents work together to observe where, when, and how behaviors occur in order to differentiate and understand what is related to ADHD and what is related to high ability.

High Ability with Autism Spectrum Disorder

ASD is a neurodevelopmental disorder related to poor social communication and rigid, stereotypical patterns of behavior (APA, 2013). It is occurring at increasingly higher numbers; current figures estimate 1 in 68 children have ASD, and it affects approximately 4.5 times more boys than girls (i.e., 1 in 42 versus 1 in 189; Christensen et al., 2016). Evidence demonstrates the presence of both internalizing and externalizing symptoms as reported by both parents and teachers, many of whom meet diagnostic criteria for comorbid disorders, such as anxiety and depression (Barnhill et al., 2000; Bellini, 2004; Gillott, Furniss, & Walter, 2001; Loveland & Tunali-Kotoski, 2005; Macintosh & Dissanayake, 2006; Meyer, Mundy, Van hecke, & Durocher, 2006). These symptoms often are not reported by the youth themselves, possibly because of their limited insight into personal strengths and areas for growth (Doobay, Foley-Nicpon, Ali, & Assouline, 2014; Reynolds & Kamphaus, 2004). Yet some authors suggest higher functioning adolescents with ASD often develop insight into their difficulties, which subsequently leads to social stress, feelings of inadequacy, anxiety, and depression (Foley-Nicpon, Doobay, & Assouline, 2010).

High ability students with ASD may look similar cognitively and academically to their high ability peers without a diagnosis, but differ significantly in terms of adaptive functioning and social communication skills (Assouline, Foley-Nicpon, & Doobay, 2009). Additionally, their lower order thinking skills (working memory and processing speed) seem to be important factors in academic achievement, as is participation in gifted and talented programming (Assouline et al., 2012). Increasingly, attention is being paid to treatment and intervention for high ability children with ASD, as well as to the heterogeneity of symptom presentation and how it affects treatment outcome (Khouzam, El-Gabalawi, Pirwani, & Priest, 2004). Similar to ADHD, there are some general symptoms that overlap among high ability and ASD populations, such as an intense focus on specific subjects, uncooperative

behavior, and difficulty making friends, which can make diagnostic differentiation challenging (Gallagher & Gallagher, 2002).

High Ability with Specific Learning Disorder

Learning disorders are defined as impairment in learning the academic skills of reading, writing, or mathematics and are diagnosed when performance is significantly lower than age expectations, level of education, and ability level (APA, 2013). Because the selection processes for gifted programs and special education are mutually exclusive, identification of both high ability and disability is challenging (Foley-Nicpon et al., 2011) and high ability students with a learning disability do not always receive adequate services (Bees, 2009; Brody & Mills, 1997). Due to the often uneven ability and achievement profiles of these students, using composite scores on norm referenced tests may miss their strengths and disabilities (Ottone-Cross et al., 2017). As a result, many high ability students with SLD are not identified until high school or college when academic work increases in difficulty. In earlier years, they may appear to be functioning at expected level for their age, but are instead performing well below their potential (Dole, 2000).

Progress monitoring data, gathered from curriculum-based assessments administered within a Reponses to Intervention (RtI) framework, may be useful to screen for the co-occurrence of high ability and SLD. For example, McCallum et al. (2013) reviewed the curriculum-based assessment data of 1242 students and provided formulas for schools to flag 1–10% who demonstrated reading-math discrepancies and would benefit from further comprehensive evaluation. They emphasized the screening nature of this approach and advocated for using liberal cut-scores, since false positives have less ramifications than false negatives. Others (Coleman & Johnsen, 2013; Pereles, Baldwin, & Omdal, 2011) noted progress-monitoring data can be used to make curricular and enrichment recommendations and can gage students' growth trajectories. The premise is that RtI approaches can both increase student engagement in their talent domains and result in more students from underrepresented groups being selected for gifted education opportunities (Robertson & Pfeiffer, 2016).

From a social-emotional perspective, some research findings suggest that high ability students with SLD lack self-confidence, express feelings of inferiority, or hold unrealistic self-expectations (Moon & Reis, 2004; Reis et al., 1997). They may experience social and emotional difficulties if they struggle to understand why there is a discrepancy between their knowledge and work production (Reis & Colbert, 2004). Academic self-concept may be affected (Bear, Minke, & Manning, 2002; Shany, Wiener, & Assido, 2013) more so than global self-concept (Zeleke, 2004). Other preliminary findings where gifted students with SLD reported self-concepts in the average range suggest having high abilities may be somewhat protective (Foley-Nicpon et al., 2015). Furthermore, obtaining a learning disability diagnosis, in and of itself, may positively influence self-esteem (MacMaster, Donovan, & MacIntyre, 2002), possibly because of increased understanding about one's strengths and areas for growth. It is important to recognize the intersection of students' abilities and disabilities, how they influence self-concept, and the role of psychosocial factors in the development of talent domains (Foley-Nicpon et al., 2015).

Evidence-Based Services

Research into evidence-based practice with twice-exceptional youth is in the nascent phase (Foley-Nicpon et al., 2011); however, the fields of education and psychology can contribute considerably to formulating ideas for best practice (Pfeiffer & Foley-Nicpon, 2018). For example, ample evidence-based therapies with children and adolescents exist, and meta-analytic studies examining their efficacy produce moderate to large effect sizes that are comparable to adult psychotherapy effect sizes (Weis, 2018). There is no reason to believe these interventions, such as behavioral and cognitive behavioral

therapy, also would not be effective with high ability youth. Just like any contextual factor influencing presentation (Bronfenbrenner, 2005), it is important to consider youths' ability and disability profiles in treatment planning (Foley-Nicpon, 2009; Mendaglio & Peterson, 2007; Peterson, 2008; Wood, 2010). From an educational perspective, scholars from special and gifted education discuss best practice for addressing high ability and disability in multiple texts (e.g., Eckert & Robins, 2016; Florian, 2013; Kauffman & Hallahan, 2011; Rimm, Siegle, & Davis, 2017), but investigating the interplay of these two specialties and how they could work together to help twice-exceptional students has had less empirical attention. Considering these caveats, we will review known intervention research for twice-exceptional students from individual and systems-level perspectives.

Individual and Group-Based Interventions

To date, no research studies have examined individually based psychological interventions with twice-exceptional children. However, sources exist to help guide therapy with high ability students that may be applicable to the twice-exceptional. For example, Pfeiffer (2013) stressed the need to involve systems in which the child interacts, and to provide services from an empirically grounded theoretical orientation (e.g., cognitive behavioral therapy, interpersonal therapy, behavior therapy). He emphasized including parents and/or guardians in treatment, and to utilize evidence-based interventions related to the child's identified *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; APA, 2013) diagnosis. Finally, Pfeiffer highlighted the therapeutic relationship as a necessary mechanism for change. Peterson (2017) also has written extensively about counseling gifted students and offers many suggestions, including understanding behaviors within a developmental framework, having empathy for a lack of cognitive peers, provision of career-based interventions, and attention both to academic and nonacademic domains in treatment planning.

There is one group-based intervention for high ability individuals with social deficits that has received limited empirical support. In this intervention, video self-modeling, students learn skills by viewing their own and peers' group interactions. It has shown promise with high functioning individuals with ASD (Buggey, Hoomes, Sherberger, & Williams, 2011) and with high ability students with social deficits (Foley-Nicpon et al., 2017). Specifically, video-modeling interventions that address friendship-making skills may have positive outcomes for high ability students with social deficits, but how students approach academics may influence the way they approach friendship-making skills. That is, students who placed value on performing better than peers academically did not form as close of friendship bonds as those who did not (Foley-Nicpon et al., 2017). Teaching students about the difference between mastering content and fostering friendship may benefit high ability students with ASD and/or social difficulties.

Family-Based Interventions

Although not specifically for twice-exceptional children, scholars in Australia (Morawska & Sanders, 2009) developed and tested a tailored *Group Triple P—Positive Parenting Program* with parents of high ability youth. In their randomized control trial, the authors modified the intervention to be *Gifted and Talented Group Triple P*, which included issues specifically pertaining to parents of gifted children: establishing expectations, problem-solving, managing anxiety, and interacting with schools. In comparison to parents in the control condition, parents in the *Gifted and Talented Group Triple P* condition reported decreased behavior problems and fewer perceived hyperactivity symptoms in their high ability children. These preliminary results support the idea that proven interventions, such as behavioral parenting programs, can be modified for use with high ability students (Moon & Hall, 1998).

Developing advocacy skills is another type of intervention for parents of twice-exceptional children. Through qualitative inquiry, parents in two studies (Besnoy et al., 2015; Speirs Newmeister, Yssel, & Burney, 2013) described their advocacy efforts as being ongoing and crucial to students' success. Speirs Newmeister et al. (2013) indicated parents felt responsible for recognizing and understanding their child's abilities and disabilities, and for their child's academic success. Besnoy et al. (2015) also indicated parents felt responsible for understanding twice-exceptionality. However, they did not find this knowledge through interacting with the school system. Parents reported this breakdown of communication between systems was problematic, time consuming, and frustrating. Positive relationships among systems is a key component in the bioecological model (Bronfenbrenner, 2005) and necessary to meet twice-exceptional students' complex needs.

School-Based Interventions

Educators play a crucial role in supporting twice-exceptional students (Dare & Nowicki, 2015a, 2015b). Specifically, talented and gifted educators must be the primary advocates because of limited awareness about twice-exceptionality among general education teachers (Foley-Nicpon et al., 2013). They are called to promote accelerative and enrichment opportunities for twice-exceptional students within their talent domains.

Although it is considered a viable education educational option, little empirical work has examined twice-exceptional students' participation in advanced or acceleratory educational opportunities (Foley-Nicpon & Cederberg, 2015). In a study of twice-exceptional students in AP coursework, Schultz (2012) found school culture and attitude toward twice-exceptional students, as well as school size, influenced enrollment. Students from smaller schools where counselors were familiar with students' strengths and limitations fared better. Furthermore, accommodations were employed inconsistently, which could negatively impact performance. Yet exposure to early, college-level coursework was perceived as beneficial because their initial exposure to college-level coursework was in an environment where they were closely mentored.

Additional research findings support incorporating a strengths-based, talent-focused approach with twice-exceptional learners (Baum, Schader, & Hébert, 2014). Baum et al.'s (2014) model, the *Multiperspectives Process Model* (MPPM), is a student centered, systems approach that simultaneously focuses on students' talent domains, learning differences, social and emotional development, mental health diagnoses, and family context when developing curriculum and instruction for each student. In their case study of the MPPM's effectiveness, Baum and colleagues identified the following five factors as associated with student growth: (1) a psychologically and physically safe environment; (2) tolerance for developmental asynchrony; (3) time to develop delayed skills, such as executive functioning; (4) positive relationships in schools; and (5) consistent use of a talent focused approach toward learning. Participating in talent development activities enabled students to become part of a social group and helped them overcome social, emotional, and cognitive challenges. While the MPPM model has demonstrated effectiveness, it is individualized and, as a result, potentially too costly for most public-school settings. However, as the authors note, implementation of the strategies could be modified if the philosophy toward learning remains intact. For example, establishing a psychologically and physically safe environment and maintaining a talent focused approach toward learning is beneficial for all students, and can be the cultural expectation set by school administration. Individual asynchrony and the need for skill development can be addressed through an Individualized Education Plan (IEP) or 504 Plan (i.e., Section 504 of the Rehabilitation Act of 1973), peer mentoring, or lunch bunch strategies to improve peer relationships.

Assuming a strengths-based perspective toward learning does not mean symptoms related

to disability are ignored; rather, understanding a student's unique patterns of strengths and limitations is foundational for success. For instance, performance on achievement tests suggest gifted students with learning disabilities have strong higher-order thinking skills that require targeted talent development opportunities, as well as low-level processing difficulties that impact learning of basic skills (Ottone-Cross et al., 2017). For example, once learning disabilities are identified, testing should take place with recommended accommodations in place to reduce the negative effects of the disability when measuring an academic construct (Thompson, Blount, & Thurlow, 2002). Some examples include modifying tests, providing extended time, or allowing for small group or individuated test settings (Bolt & Thurlow, 2004). Yet, not all high ability students with disabilities are afforded their accommodations in advanced academic settings (Schultz, 2012), which could negatively impact performance.

Accommodations that work for twice-exceptional students vary depending on the domain in which the student is experiencing struggles. For example, a student who has a reading disability may need accommodations on all subjects within high states tests, not just ones that predominantly tap reading (Mee Bell, Taylor, McCallum, Coles, & Hays, 2015). This may be true even when math is the student's talent domain if word problems involve a significant amount of reading, and that is the student's area of disability. Recent research (Mee Bell et al., 2015) supports this phenomenon. Among 1242 third graders, those identified through curriculum-based measures as high ability in reading and low in math performed at a high level on achievement outcome measures in both reading and math. However, those identified as high ability in math and low in reading performed significantly lower on both math and reading achievement outcome measures. The math problems on the outcome measure appeared to have a high reliance on reading skills, so the disability impacted both domains.

Diversity and Multicultural Considerations

Examination of students of color in specialized educational settings reveals African American students are underrepresented in gifted education (Ford & Moore III, 2013; Ford & Whiting, 2011) and overrepresented in special education (Gardner III & Mayes, 2013), and the opposite is true for some Asian American students (Chhuon & Sullivan, 2013; Yoon & Gentry, 2009). It is uncertain why this discrepancy exists, but may be related to educator bias and lack of understanding of culturally diverse students (Obiakor, Beachum, & Harris, 2010). Limited research with high ability students of color makes it so that we have only general impressions of their lived experiences. Some suggest African American students who participate in gifted and special education often experience solely low expectations for performance (Banks & Hughes, 2013; Ford, Trotman Scott, Moore III, & Amos, 2013; Gardner III & Mayes, 2013) and find their racial/cultural perspective is not represented in their courses or school environments.

To date, we know of two empirical studies examining twice-exceptionality among racially/ethnically diverse students, and both are qualitative in nature (Mayes & Moore III, 2016a, 2016b; Park et al., 2018). Among eight twice-exceptional African American students, several themes emerged from interviews: (1) the significance of special education and "gifted" labels; (2) concerns about academic and professional futures; (3) celebrating talents; (4) varying relationships with educational professionals; and (5) a desire for academic support (Mayes & Moore III, 2016a, 2016b). Among 11 parents of Asian American twice-exceptional students, the following themes arose: (1) recognition of and reactions to their child's gifts and disabilities; (2) lack of educational resources; (3) responding to cultural expectations; (4) restructuring family values; and (5) navigating personal versus family of origin parental engagement (Park et al., 2018). These preliminary results suggest there are shared experiences

among all twice-exceptional students and their parents, along with some issues specific to cultural context.

Recommendations

Based on current knowledge regarding identification of and intervention with twice-exceptional students, the following recommendations are offered.

1. *Focus on training*. Research findings demonstrate that if students are first identified for special education, they are not likely to also be referred for gifted education (Crim, Hawkins, Ruban, & Johnson, 2008). This may be because educators outside the gifted subspecialty know very little about twice-exceptionality (Foley-Nicpon et al., 2013). Therefore, teacher training programs should include education about high-ability students with and without disabilities (Foley-Nicpon et al., 2011).
2. *Consider ways to adapt current empirically supported treatments for twice-exceptional students*. There are few scholars who conduct research with twice-exceptional students; however, this should not preclude mental health professionals from adapting efficacious treatments with twice-exceptional youth. Reality is that twice-exceptionality, by its very definition, is a low-incidence population. It is, therefore, extremely challenging to gather necessary sample sizes to test treatment modality effectiveness. Instead, it appears identification is critical so that all contextual factors are considered when developing students' talent domains (Subotnik et al., 2011). It seems more problematic if these contextual factors are not identified than if a practitioner does not know whether a specific cognitive-behavioral intervention has been tested with twice-exceptional youth. Nevertheless, it would be fruitful to increase research with twice-exceptional populations, and include longitudinal studies examining career and educational outcomes that would help inform identification and treatment (Antshel et al., 2008; Assouline et al., 2012; Foley-Nicpon et al., 2011).
3. *Maintain a strengths-based perspective*. Grounded in positive psychology philosophy (Seligman & Csikszentmihalyi, 2000; Seligman, Ernst, Gillham, Reivich, & Linkins, 2009) is the premise that developing strengths is beneficial for all children, including those who are twice-exceptional. This approach is also supported by many in gifted education who advocate for focusing on what children *can do*, rather than their areas of struggle (Baum et al., 2014; Neihart, 2008; Reis, McGuire, & Neu, 2000). This does not mean students should enter advanced coursework or enrichment activities without accommodations. Rather, students benefit from exposure to advanced material within their talent domains while receiving accommodations for their identified disability domain.
4. *Disseminate educational materials to caregivers*. Parents and school personnel would benefit from a network of resources to improve understanding of twice-exceptionality (Besnoy et al., 2015; Speirs Newmeister et al., 2013). Several resources currently exist: the Belin-Blank Center's Assessment and Counseling Clinic, the *Twice-Exceptional Newsletter*, the Davidson Institute, the *Hoagies' Gifted Education Page*, and the SENG (Supporting the Emotional Needs of the Gifted) Organization, to name a few.

Conclusion

Twice-exceptional youth often present with complex needs that make identification and intervention challenging. Because of the masking effect, the students' ability and/or disability may not be recognized, which can be confusing and frustrating. Curriculum-based assessments may help flag those with high abilities and learning differences, but comprehensive evaluation is best practice for identification the students' complex needs.

In line with the bioecological model (Bronfenbrenner, 2005), comprehensive evaluation is a practice that identifies and considers contextual factors that influence talent development. Once identified, empirically based treatments from psychology and education can and should be attempted with an individualized perspective that considers the student's ability and disability presentation. Assuming a strengths-based approach is then recommended to further the students' talent domains in a supportive, healthy environment.

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