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Gifted Students

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Abstract

Gifted students are individuals who are recognized for performance that is superior to that of their peers. Although giftedness is typically associated with schooling, gifted individuals exist across academic and nonacademic domains. In this review, we begin by acknowledging some of the larger debates in the field of gifted education and provide brief summaries of major conceptual frameworks applied to gifted education, dividing them into three categories: frameworks focused on ability, frameworks focused on talent development, and integrative frameworks. We then discuss common practices used to identify gifted students, giving specific attention to the identification of those in underrepresented groups, followed by brief overviews of the numbers of students who are classified as gifted, programming options for gifted students, and social and emotional issues associated with being gifted. We conclude with a discussion of several unresolved issues in the field.

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INTRODUCTION

In simple terms, gifted students are those who are exhibiting superior performance in a particular domain relative to peers. Nonetheless, the discourse on gifted students in the United States can be contradictory and fractious. On the one hand, Americans celebrate innovation and inventiveness and acknowledge that, like their peers with learning challenges (see the Education for All Handicapped Children Act, 1975, PL 94-142), gifted students are entitled to a free and appropriate public education (Subotnik et al. 2011). Many also recognize that the nation's elite colleges and universities are, de facto, gifted programs (Wai 2014) serving gifted students in late adolescence and young adulthood, and that these students contribute disproportionately to the nation's gross domestic product (Rindermann & Thompson 2011). On the other hand, unlike special education for youth with learning challenges, gifted education is not mandated by the federal government, and the amount of federal dollars spent on gifted education is less than 0.5% of the federal education budget (Wai & Worrell 2017). Thus, states and districts that serve gifted students are doing so with local funds that might be used for what many argue are more pressing needs, like teacher salaries (Gollan 2011).

There are also debates within the field of gifted education. Numerous models of giftedness have been formulated (Coleman & Cross 2005; Sternberg & Davidson 1986, 2005), with no consensus on what the gifted label means. Although research strongly supports accelerated programming for gifted students (Assouline et al. 2015, Steenbergen-Hu et al. 2016), even support for acceleration is not universal. In terms of what the aims of gifted education should be, some argue for individual self-actualization (e.g., Piechowski 1986) and others for maximizing potential that will result in both self-actualization and contributions to society (e.g., Sternberg 2017, Tannenbaum 1986, Worrell et al. 2018). Finally, there are those who contend that "if identified as gifted during childhood on the basis of one's IQ score, for example, we can assume that the 'gifted' label persists throughout adulthood" (Rinn & Bishop 2015, p. 218). Others argue that, as individuals move from childhood to adulthood, the criterion for the gifted label shifts from potential to actual accomplishment and contribution in a domain (Dai 2010, Subotnik et al. 2011).

In this review, we delve into the contradictions noted above. We begin with a comprehensive overview of models of giftedness, as these set the stage for much of the dialog in the literature. After reviewing the models, we discuss ways in which gifted students are identified, providing (*a*) an overview of best practices, (*b*) a summary of the practices actually used in schools, and (*c*) identification issues related to ethnic or racial and socioeconomic disparities in identification. We then provide data on the number of students who are identified as gifted and talented. In the next section, we discuss programming for gifted students, delineate the types of acceleration and enrichment programs that are used both inside and outside of the school system, and review the critical role that out-of-school programs play in serving gifted students. We also discuss programs that have been successful in recruiting and serving underrepresented students.

The next section focuses on psychosocial profiles of gifted students. Research suggests that gifted students are at least as well adjusted as and no more vulnerable than their nonidentified peers (Erwin 2015). However, the literature still makes claims about emotional vulnerabilities, and we know that, for gifted adults in at least some domains, associations between achieved eminence and psychopathology (Simonton & Song 2009) have been reported. Psychosocial variables also play an important role in supporting gifted students in developing their potential gifts, although some of these variables are likely to be more useful than others (Dixson et al. 2016, 2017).

We conclude with an evaluation of the state of gifted education and provide some guidance for the field using several questions related to unresolved issues. How do we close achievement and opportunity gaps in gifted education? How much weight should be given to variables beyond ability in the identification process? Is there a role for federal government in gifted education? What should be the goal of gifted education programs? It is important to acknowledge that we approach these questions from the perspective of talent development, but we do our best to represent the range of views in the field.

MODELS OF GIFTEDNESS

As noted above, there are multiple models of giftedness. In their 1986 book on gifted models, Sternberg and Davidson included 16 different conceptions; the second edition (Sternberg & Davidson 2005) contained several additional models, including Borland's (2005) argument against any conception of giftedness. Giftedness is generally associated with schooling and gifted and talented education, although we discuss topics other than academic performance in this review. As researchers and practitioners seek to identify evidence-based practices that can be implemented in schools to help turn childhood abilities into adult creative productivity, they typically turn toward a model of giftedness, and the practices used in a country, state, or district depend to a large extent on the specific theoretical framework that has been adopted.

For many years, the most widely used model in US schools has been Renzulli's (1977, 2016; Renzulli & Reis 1997) enrichment triad. Outside the United States, the talent search model (Olszewski-Kubilius 2015; Stanley 1976, 1985) has served the most youth. In Canada and Australia, Gagné's (2005) differentiating model of giftedness and talent (DMGT) is most popular, and in some European and Asian countries, Ziegler's (2005; Phillipson et al. 2013) actiotope model has been widely implemented. Below, we describe several of the major models of giftedness in the literature. For more complete reviews, including reviews of additional models, we refer readers to Coleman & Cross (2005), Dai (2010, 2018), Dai & Chen (2014), Pfeiffer et al. (2018), and Sternberg & Davidson (1986, 2005). In this section, we divide the models into three groups: (*a*) models for which the primary focus is on ability, (*b*) models for which the primary focus is on the development of talent in interaction with the opportunities in the environment, and (*c*) models that integrate at least two other models. We acknowledge that there is some overlap among the models on these factors, but the distinction provides a useful form of differentiation.

Giftedness as Ability

Perhaps the most common conceptualization of giftedness is as high cognitive ability (i.e., *g*) or IQ, a variable that continues to play a major role in most models of giftedness. However, several contemporary conceptualizations extend giftedness beyond *g* to other theories of intelligence and domain-specific abilities.

Giftedness as general cognitive ability. One of the earliest studies in the gifted literature is Terman's (1922, 1925; Terman & Oden 1959) longitudinal study of genius. Terman argued that research had provided as much information as it could by studying adults. Thus, for him,

> "the next logical step [was] the study of genius in the making, that is, the investigation of gifted children. . . . Moreover, follow-up work with large numbers of gifted children will throw light upon genius which aborts or deteriorates, as well as upon that which fulfills its promise" (Terman 1922, p. 311).

Terman (1922, p. 312) operationalized giftedness as high IQ and reported publishing data on 25 students with IQ scores above 120 and 59 students with IQs "for the most part above 140."

Triarchic theory of intellectual giftedness. Whereas Terman (1922) saw giftedness as a product of general intelligence, according to Sternberg (1986; Sternberg et al. 2001), giftedness is composed of three different but interrelated facets: analytical, creative, and practical intelligence. Analytical intelligence, manifested by individuals internally, consists of executive processes and one's ability to acquire novel information and to evaluate and critique ideas; it is most akin to general ability. Creative intelligence involves extending one's analytical ability to dealing with novel or unfamiliar problems. Practical intelligence involves extending the analytical components to dealing with everyday problems and to successfully accomplishing one's goals. According to Sternberg, some people are more gifted analytically, some creatively, and some practically, and some are gifted in more than one area. The most intelligent people are those who know and can capitalize on their strengths, while also being aware of and compensating for their weaknesses.

Multiple intelligences. Gardner's (1983) notion of multiple intelligences initially argued that there were seven different intelligences—linguistic, logical–mathematical, musical, bodily–kinesthetic, spatial, interpersonal, and intrapersonal (Gardner 1983)—and later added naturalist intelligence, spiritual intelligence, and existentialist intelligence to his model (Gardner 1999). Gardner was well aware that he was going beyond the zeitgeist by "appropriating a word from psychology and stretching it in new ways" (Gardner 1999, p. 477). Like Terman (1922) and Sternberg (1986), Gardner believed that individuals who were outstanding in at least one of the 10 intelligences were gifted, and like Sternberg, he contended that the analytical intelligences valued in schooling—the linguistic and logical–mathematical intelligences—did not reflect all of human cognition. Gardner (1999, p. 477) defined intelligence as "a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture." Importantly, this model highlighted the pivot toward domain-specific conceptualizations of ability and giftedness.

Talent search. The talent search model, initiated by Julian Stanley (1976), was predicated on being exceptional (in the top 1%) in the two primary academic domains: mathematical ability and verbal ability. Stanley saw these two abilities as instantiations of general ability in academic contexts and believed that using above-grade-level achievement tests with gifted students allowed for an optimal match between their domain-specific abilities and instruction. The talent search model has the strongest current research base of all models predicting future productivity, in large part due to research conducted on two cohorts of talent search participants identified in the 1970s for the Study for Mathematically Precocious Youth (SMPY) and still being followed to date (e.g., Lubinski 2016), in addition to a recent replication in a group similar to the SMPY sample (Makel et al. 2016). In keeping with Gardner's (1983) model, some participants in the talent search are assessed for spatial ability, which has proven useful in providing more specificity in predicting educational trajectories and occupations (Kell et al. 2013, Lubinski 2010).

Giftedness as Talent Development

The talent development models differ from the ability models in several ways. First, although they acknowledge the importance of ability, either explicitly or implicitly, they emphasize the fact that giftedness in childhood is based on potential that must be developed to produce a gifted adult. Second, they highlight the importance of other psychological factors, such as motivation, in moving from potential to fully developed talent. Third, in most cases, these models apply to both academic and nonacademic domains.

Tannenbaum's talent development model. Tannenbaum (1986) proposed one of the earliest talent development models in the field, and his definition of giftedness went beyond the confines of school walls to all domains. He noted,

> "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" (Tannenbaum 1986, p. 33).

According to Tannenbaum (1986), the necessary ingredients that lead to fulfillment of childhood potential include general ability, specific abilities associated with domains of talent, external support, psychosocial skills, and chance factors.

The three-ring conception of giftedness. Renzulli (1978) proposed a definition of giftedness that was revolutionary in that it eschewed the use of high-ability cutoffs. He argued that giftedness consisted of three parts, represented by three overlapping circles: task commitment; creativity; and above-average, but not necessarily superior, ability. He also distinguished between schoolhouse giftedness (as measured by standardized ability tests) and creative–productive giftedness (as measured by outstanding contributions). This three-ring conception has been translated into school-based programming applied in the enrichment triad model (Renzulli 2016). Enrichment opportunities are provided to students at three different levels based on the students' readiness for challenge. Renzulli & Reis (1997) argued for wide-ranging access to enrichment at Stage 1. Stage 2 opportunities are more focused on domains, content skills, and content knowledge for those students who demonstrate commitment and motivation. Stage 3 involves guided support for a creative project that would exhibit creative productivity that is age appropriate. Notably, this model is not operationalized after the school years.

Differentiating model of giftedness and talent. The DMGT model (Gagné 2005)—recently renamed the integrative model of talent development (IMTD; Gagné 2018)—seeks to explain how childhood giftedness is transformed into adult talent. Gagné explicitly recognizes and incorporates the biological foundations of abilities. These foundations, interacting with environmental press, lead to mental and physical gifts, and the gifts, in turn, develop with opportunities and commitment on the part of the individual into competencies or talents in various domains. Thus, for Gagné (2018, p. 165), gifts are potentials based on "biologically anchored and informally developed natural abilities or aptitudes" and talent is "the outstanding mastery of systematically developed competencies (knowledge and skills) in at least one field of human endeavor." Gagné delineates the gifted as those in the top 10% of natural ability and the talented as those in the top 10% of achievement. The IMTD explores how natural abilities develop, setting the stage for their translation into talents via environmental and intrapersonal catalysts and developmental processes.

Pyramid model. Piirto's (1998) model uses a pyramid with four levels to display the characteristics of giftedness. The base is made up of an individual's inherent traits, reflecting the contributions of genes. This base provides a foundation for a large set of personality traits and emotions that specifically enhance or inhibit talent development. These traits are not viewed as particularly malleable, but rather as a natural outgrowth of one's inherited genetic profile. Genes (level 1) and personality traits (level 2) support the cognitive aspect of the pyramid (level 3), translated more specifically into IQ. The top level of the pyramid is talent, which is manifested in specific abilities. These too are not viewed as malleable. Finally, the apex of the pyramid is the most distinctive aspect of Piirto's model, in that it features the drive or calling, including elements of dreams and commitment, that propels talent to fulfillment. Surrounding the pyramid are many different environments, including one's home, school, community, and culture. Gender, although not, according to Piirto, a separate part of one's environment, affects the way in which environments are experienced. Finally, the role of chance is highlighted, as the family, gender, and culture into which one is born are all chance factors.

Actiotope model. The actiotope model of giftedness (Ziegler 2005) portrays giftedness as a dynamic interaction between person and environment. The person element consists of individuals' motivation to accomplish goals to an excellent degree, as well as their belief that they are sufficiently capable. If a person's abilities are accompanied by the awareness of how the goal can be met, and if the person garners recognition from the community and society that this talent and motivation must be supported with training and other opportunities, then that goal is likely to be fulfilled. Elements of the environment include domains of talent and personal, social, educational, and cultural settings. The dynamic component of the model is manifested in the constant need to find equilibrium among goal aspiration, effort and energy expended, degree of excellence achieved, and what is available in the environment.

Bloom's model. Bloom (1985) and his colleagues at the University of Chicago conducted a study involving 150 US-born performers and scholars who had achieved outstanding recognition by age 30. This retrospective study included individuals in six fields across three domains—the visual and performing arts (concert pianists and sculptors), athletics (Olympic swimmers and world-class tennis players), and science (mathematicians and neurologists)—which allowed the researchers to identify patterns across these disparate disciplines. The researchers identified a generalizable, developmental model of experiences provided by the participants' teachers over time. They found that the goal of initial teaching was to elicit love for a topic, skill, domain, or idea. The second stage of teaching focused on providing a range of skills, knowledge, and values associated with mastering and contributing to that topic, skill, domain, or idea. The third stage, often conducted in early adulthood, took the form of mentoring students to find a niche in which a talented individual could make a creative contribution to a field or domain.

Advanced academics. The advanced academics model is a recent addition to the literature. It is similar to the talent search model in that it focuses solely on academic performance and advocates for instruction that challenges students who are ready to move beyond the regular curriculum (McBee et al. 2012a; Peters et al. 2014). It differs from the talent search approach in that it focuses on the entire classroom, rather than just the top 1% of students. According to this model, grouping children for advanced instruction should be based on past performance in the subject rather than on tests of ability or gifted identification:

> "Determining whether or not a child meets the formal definition of giftedness is not a particularly useful thing to do from the point of view of the stakeholders in K–12 education. . . . Instead, we believe that it is much more educationally helpful to determine which children are not being well-served by the existing curriculum and then design programs to meet their needs" (Peters et al. 2014, p. 1).

From this perspective, all students who are ready to have access to advanced coursework should receive it, and this approach to gifted education is likely to serve high-achieving youth who are underrepresented in programs for gifted students.

Contextual, emergent, and dynamic model. Dai's (2010) contextual, emergent, and dynamic (CED) model is a general developmental model applied to giftedness. Dai (2010, p. 196) argues that humans are "dynamic, open living systems" that are influenced by three dimensions: function, development, and time. The functional dimension consists of the interactions between an individual and the environment. The temporal dimension refers to the time over which transactions between the individual and the environment take place. The developmental dimension refers to incremental and qualitative changes that occur as the individual interacts with the environment and becomes more competent over time. For example, Dai notes that an IQ score of 140 at age 6 does not mean the same thing functionally and developmentally as an IQ score of 140 at age 16. According to the CED model, giftedness is a concept reflecting competence, and gifted competencies are fluid and responsive, thereby rendering the conclusion that giftedness is a fixed trait "untenable" (Dai 2010, p. 195).

Deliberate practice. Ericsson and his colleagues (e.g., Ericsson & Pool 2016, Ericsson et al. 1993) have argued that giftedness is expert performance, and expert performance results from "extended deliberate practice" (Ericsson et al. 2005, p. 287). The basic contention is that differences in ability or innate potential are not important predictors of expert performance, and that controlled studies of experts and nonexperts reveal that the primary difference between the groups is the amount of deliberate practice. Ericsson and his colleagues (1993, p. 367) noted that deliberate practice is not routine but rather practice "with the primary purpose of attaining and improving skills." For deliberate practice to be effective, the individual must be attentive and engage in effortful behavior, the task needs to account for the knowledge that the individual already possesses, feedback must be immediate and informative, and the individual must engage in the task repeatedly. A different group of scholars argue that, although deliberate practice is essential to developing expertise, higher ability allows individuals to better capitalize on the benefits of such practice (Hambrick et al. 2018).

Integrative Models

The final three models reviewed are integrative models, in that they are based on combinations of other models in the literature. These models are developmental into adulthood and include a focus beyond the academic domains.

Scholarly productivity/artistry. Subotnik & Jarvin (2005) developed the scholarly productivity/artistry (SP/A) model after studying classical music talent development in conservatories around the world. The model incorporates Sternberg's (2001) notion of giftedness as developing expertise, as well as Bloom's (1985) findings on the different types of teachers required for different stages of talent development. Based on interviews with 80 faculty members, students, and gatekeepers (e.g., critics and artistic directors who select performers for venues), the model's original contributions highlight both the consistent and changing psychosocial skills associated with transitions from abilities to competencies, from competencies to expertise, and from expertise to SP/A. In a more recent study, the model was used to explain the development of talent in the mathematics domain (Subotnik et al. 2009).

Multifactorial gene–environment interaction model. A relatively recent addition to the extant literature, the multifactorial gene–environment interaction model (MGIM) (Ullén et al. 2016) is a model of expertise rather than talent development. However, Ullén et al. (2016, p. 427) defined expertise as "superior performance within a specific domain," and many scholars agree that giftedness is manifested as expert performance (e.g., Ericsson et al. 2005). Moreover, Ullén et al. developed the model in part to account for what they saw as limitations in the deliberate practice explanation for expertise. Thus, it is an appropriate framework to include in thinking about gifted students. The MGIM integrates elements from several different models and includes general and domain-specific abilities, personality, interests, motivation, deliberate practice, neural mechanisms, and physical properties, all of which are influenced by genes and the environment. Thus, it is similar to the megamodel (see the following section) (Subotnik et al. 2011, 2018) in scope and applicable to multiple domains (e.g., Hambrick & Tucker-Drob 2015).

Megamodel of talent development. The megamodel, developed by Subotnik et al. (2011, 2018), synthesizes the psychological science on giftedness, talent, creativity, high performance, expertise, and eminence, as well as the major models of giftedness in the extant literature. Building on existing frameworks in the literature, the megamodel defines giftedness as potential in the early years, which transitions into expertise in a domain through effort and opportunity, and sometimes into eminence, in fully developed talents, reflected in enduring contributions in a domain. Although some principles of the model are consistent across all domains, there are principles associated more with performance domains (e.g., sport or music, where what you need to practice is more clearly defined) and others with production domains (e.g., writing or scientific research, where outstanding contributions are often understood only by domain insiders). The core principles of the model are as follows: (*a*) abilities are malleable, particularly those specific to domains; (*b*) fields and domains begin, peak, and end at different points; (*c*) opportunities must be offered at the developmentally appropriate time; (*d*) opportunities must be taken by individuals to enhance talent; (*e*) mental and social skills are essential in transforming abilities into competencies, competencies into expertise, and expertise into eminence; and (*f*) talent development is a long-term endeavor, extending beyond the school years into adulthood.

Discussion

As may be evident, across the three categories of models—ability focused, talent development, and integrative—there are a number of commonalities. For example, high ability, whether general or more specific (e.g., mathematical, creative, bodily–kinesthetic), is an explicit prerequisite for giftedness in the ability-focused models, and although the other models are not as focused on superior ability [e.g., Renzulli's (1978) above-average ability or Gagné's (2005) top 10%], they acknowledge ability's role in gifted performance and the need to adjust the curriculum for those who can benefit from greater challenge. In most models, there is also the implicit recognition that giftedness as a child does not necessarily result in outstanding contributions as an adult. Terman (1922) wanted to understand how genius could be derailed, and Sternberg (1986) noted the importance of compensating for weaknesses. This idea that the gifted child does not necessarily become a gifted adult is more explicit in the talent development and integrated models, almost all of which begin with potential and note the need for opportunities and resources to allow talent to develop. The role of psychosocial variables and the idea of developmental trajectories are also explicit in the talent development and integrative models. The talent development and integrative models also recognize the importance of effort and practice, although they do not argue that deliberate practice without potential is sufficient to explain outstanding performance.

Most of the models in the literature are descriptive or based on reviews of the literature, and, as such, have little or no direct empirical support. However, as noted above, there is a robust literature supporting the efficacy of the talent search model. Research has indicated that individuals identified via above-grade-level testing in mathematical, verbal, and spatial ability achieve outstanding educational and occupational outcomes, including creative products (Lubinski 2016, Makel et al. 2016), perhaps due to the fact that talent search participants frequently engage in accelerated classes, which are also well supported in the empirical literature (Steenbergen-Hu et al. 2016). These findings are also in keeping with Terman's (1925; Terman & Oden 1959) results for students identified on the basis of IQ. Although the majority of students chosen on the basis of ability do not become eminent (Subotnik et al. 1993), they do demonstrate substantial expertise in adulthood, supporting the general contention that children with superior abilities have the potential to make strong contributions as adults (Lubinski 2016, Lubinski et al. 2014, Makel et al. 2016, Subotnik et al. 2011, Terman & Oden 1959).

There is also substantial evidence that deliberate practice contributes to superior performance across a wide variety of domains, including chess, music performance, sports, board games, video games, and dance (Ericsson & Pool 2016, Ullén et al. 2016). The proponents of deliberate practice argue that this construct is both necessary and sufficient to explain expert performance. However, this view is not shared by several researchers (e.g., Subotnik et al. 2011) and has also led to the development of the MGIM (Ullén et al. 2016), which stands in direct opposition to it. As Hambrick et al. (2014) demonstrated, although deliberate practice accounts for a substantial amount of the variance in expert performance (e.g., 34% of the variance in chess; 30–40% of the variance in music), the majority of variance is not accounted for by deliberate practice, indicating that it cannot be the sole determinant of expertise. Moreover, it is not clear what deliberate practice would look like in some domains (e.g., psychology), and some even argue that there are domains, such as acting, where deliberate practice does not play a role in expert performance (e.g., Noice & Noice 2019).

Ullén et al. (2016) summarized the literature on the contributions of physical ability, cognitive ability, and personality to expert performance, providing support for the MGIM and the megamodel by demonstrating that a multitude of factors contribute to both the development of expertise and expert performance. The studies on the contribution of general and specific abilities to expert performance (e.g., Lubinski 2016, Makel et al. 2016, Terman & Oden 1959) also provide support for the MGIM and the megamodel, and the differential prediction of mathematical versus verbal versus spatial ability (e.g., Kell et al. 2013, Lubinski 2010) also supports the integrated models and contradicts the notion that any single factor predicts giftedness or expert performance. Relatedly, Subotnik & Jarvin's (2005) SP/A model, which was developed to explain musical talent, highlights how musical potential is transformed into musical talent, and exploratory investigations have provided support for this model in the domain of mathematics using domain relevant variables.

After a series of studies showed that triarchic theory could be used for gifted identification and instruction (e.g., Sternberg & Clinkenbeard 1995, Sternberg et al. 1996), Chart et al. (2008) reported on the Aurora Battery, developed to operationalize triarchic theory and to assess analytical, practical, and creative intelligence. However, this model has not been widely adopted in gifted education. Renzulli's (2016) enrichment triad is used extensively in schools via the schoolwide enrichment model (Renzulli & Reis 1994). This model is viewed favorably by teachers and administrators: It increases positive attitudes toward providing gifted education, and some studies indicate that students receiving instruction on the basis of the model outperform comparison-group peers (Renzulli & Reis 1994). To date, however, other than the research on the role of identification via talent search on long-term outcomes, there are few large-scale studies of any gifted models in the literature and no comparisons of the efficacy of models. With these models as a backdrop, we now turn our attention to how gifted students are identified.

IDENTIFYING GIFTED STUDENTS

The identification of giftedness has been the focus of a great deal of research and discussion within the field of gifted education, most prominently by comparing the efficacy of different assessment instruments and identification protocols for equitably recognizing K–12 gifted students. Studies have explored the use of IQ tests, nonverbal ability assessments, above-grade-level achievement tests, portfolios, teacher referrals, teacher recommendations, curriculum-based performance tasks, and even multiple measures and matrices. Although the selection of particular instruments should be tied to one's definition of giftedness, the plethora of approaches and assessment types reflects the fact that (*a*) there is no consensus definition either within the field or in federal legislation and (*b*) many models of giftedness are not easily translatable into criteria for identification.

Several researchers have identified best practices in gifted identification (e.g., McBee et al. 2014, Worrell & Erwin 2011). According to Johnsen (2011), gifted identification should be based on scores that are psychometrically sound and technically accurate, with demonstrated construct validity and reliability for the population being evaluated. Moreover, scores should yield valid inferences for the type of service or program that is being offered (e.g., assessments of mathematical reasoning ability for an advanced mathematics curriculum, above-grade-level assessments for accelerated or fast-paced courses) with low false-negative and false-positive rates. Johnsen also recommended the use of multiple measures and opined that the population identified to receive gifted services should proportionally reflect the demographics of the school or district. Thus, all students should be considered in the nomination or referral phase. Worrell & Erwin's (2011) list of best practices has considerable overlap with Johnsen's. They also recommended assessing domain-specific skills and using local norms for identification in schools and districts where students' academic profiles do not reflect national norms. These recommendations are aspirational, in that most identification practices used in schools fall far short of recommended best practice.

Current Identification Practices in Schools and Districts

The latest State of the States in Gifted Education report (Natl. Assoc. Gifted Child. & Counc. State Dir. Programs Gifted 2015) provides some insight into what data states include in their definitions and mandates for identifying gifted students. In their definitions, 34 states recognize students with high IQ, 24 recognize general academic achievement, 21 list talent in the performing or visual arts, 21 list the creatively gifted, and 20 include students gifted in a specific academic area such as mathematics or science. Only nine states specifically mention identifying low-income students, eight mention English learners, eight mention culturally or ethnically diverse students, six mention students who are twice exceptional, and three mention students who are geographically isolated or live in rural areas.

Most states require a teacher or parent referral as an initial step in their identification protocols, followed by further assessment for gifted services at multiple points across grades K–12. In the majority of states, local school districts use specific criteria to identify gifted and talented students, most commonly by applying a multiple-criteria model with a minimum of two types of information (e.g., typically IQ test score and teacher referral). The most frequently required criteria for identification include IQ scores, achievement data, teacher nominations, performance on state assessments, and student portfolios. Given variability among states in terms of funding and legislation, whether students are identified as gifted and talented is highly dependent upon the state in which they live.

Historically, the field of gifted education has relied on measures of general cognitive ability—IQ—as the hallmark of giftedness, and the field has been widely criticized for doing so, although IQ has been shown to be a substantive predictor of both school achievement and job performance (Neisser et al. 1996, Nisbett et al. 2012). The most robust research support, in terms of identification practices that have both short-term (performance in accelerated classes) and long-term predictive validity (i.e., achievement in adulthood), is for the use of IQ (Lubinski 2016, Terman & Oden 1959) and above-grade-level tests of more specific cognitive abilities (Lubinski 2016, Makel et al. 2016). For example, measures of mathematical, verbal, and spatial reasoning, when assessed via tests such as the SAT or ACT, predict successful performance in accelerated courses and programs (Olszewski-Kubilius 2015) and also predict adult achievement in related domains of practice (Lubinski 2016, Makel et al. 2016). More specifically, spatial and mathematical reasoning abilities herald adult creative achievements in science, technology, engineering, and mathematics (STEM) fields (e.g., patents, publications in prestigious journals), and verbal ability predicts comparable accomplishments in the social sciences and humanities (e.g., books, awards, publications).

Identification of Underrepresented Groups

A major, ongoing issue within the field of gifted education is the underrepresentation of low-income and culturally and linguistically diverse students within gifted programs (Peters & Engerrand 2016), often attributed to biased teachers and identification practices (Ford 1998). However, blaming the disproportionality in gifted programs on faulty identification protocols is an oversimplification of an extremely complex issue (Erwin & Worrell 2012, Worrell & Dixson 2018). First, a long-standing achievement gap among ethnic, racial, and socioeconomic groups in reading, mathematics, and every other academic subject measured nationally is evident as early as the preschool years on constructs such as recognizing letters, numbers, and shapes (Aud et al. 2010). This achievement gap, which is manifested not only in mean score differences, but also in percentages of individuals at different levels of the distribution, is also present on major tests of cognitive ability (Neisser et al. 1996, Nisbett et al. 2012). Some Asian American groups are in the top tier of performance, on average, with European Americans and multiethnic individuals making up the second tier; African Americans, Native Americans, and Latinx groups fall in the lowest tier of performance, on average.

In gifted education circles, the achievement gap among students in the highest proficiency levels has been labeled the excellence gap by researchers (e.g., Plucker & Peters 2016), reflecting the small percentages of African Americans, Native Americans, and Latinx students. The achievement gap is also referred to as the opportunity gap by researchers concerned with educational equity (e.g., Carter & Welner 2013, Olszewski-Kubilius & Clarenbach 2014), as the groups of students at the bottom of the achievement gap are also more likely (*a*) to come from families living in poverty, (*b*) to attend schools with less qualified teachers, (*c*) to receive punitive and exclusionary discipline, and (*d*) to be on the receiving end of low teacher expectations. Thus, research suggests that a contributing factor to the achievement gap is the difference in opportunity to learn that exists both between and within schools (e.g., access to advanced courses and gifted programs) (Allensworth et al. 2014, Coll. Board 2014, Giancola & Kahlenberg 2016, Loveless 2014), in outside-of-school programs (e.g., summer and weekend programs, extracurricular programs, and informal learning opportunities) (Morgan et al. 2016, Snellman et al. 2015), and between lower- and higher-income children (Reardon 2011). Regardless of the reasons for the gap, as high achievement or the potential for outstanding performance is typically indexed by ability and achievement scores, the groups with lower average distributions are inevitably underrepresented relative to their percentage in the population.

Several alternatives to the use of the traditional cognitive and standardized achievement tests have been proposed to address the issue of underrepresentation in the identification of gifted students. They include universal screening; reducing the dependence on teacher referrals; using customized local identification protocols, local norms, nonverbal ability tests, or performance-based assessments; or challenging curricula for identification. These methods are described briefly in this section.

Universal screening. A promising approach to circumventing the pitfalls of referral and nomination systems is to screen all children in the early years of schooling. Card & Giuliano (2015) studied the impact of universal screening in a large, diverse district in Florida that had previously relied on teacher referrals. The Naglieri Nonverbal Ability Test (NNAT; Naglieri 1997a,b), a group-administered instrument, was used to screen all second graders within a school district over the course of three years. English language learners and low-income students who obtained a score of 115 on the NNAT (as opposed to the usual cutoff of 130) were referred for further assessment with an individualized IQ test by a district psychologist. The IQ score required for gifted placement was the same for all students. Card & Giuliano reported that the percentage of students identified as gifted within the district rose from 3.3% to 5.5%, with the number of low-income and minority students increasing by 180%. Although the newly identified students had lower achievement, as evidenced by their scores on standardized achievement tests, they were successful in the gifted program, achieving greater gains on reading and math than students referred under the old system. The school district discontinued universal screening due to the costs involved, but the practice might be affordable if the achievement tests that most districts typically use can be employed as a universal screener.

Eliminating teacher referrals as the gateway for gifted assessment. In the Florida district that Card & Giuliano (2015) studied, teacher referrals are one of the more frequent ways in which students are identified for further assessment for gifted placement. However, using teacher referrals as a preliminary step for placement in gifted programs is another obstacle to the identification of minority and low-income gifted students (Peters & Engerrand 2016). Putting aside the issue of bias, educators' beliefs about the nature of giftedness and talent affect, at the most fundamental level, whom they refer for testing. These beliefs include viewing giftedness as a fixed characteristic or trait that is evident in effortless learning and high achievement in the standard curricula.

For example, Speirs Neumeister and her colleagues (2007) surveyed a small sample of experienced fourth-grade teachers of gifted students from a large urban school district regarding their beliefs about giftedness. More than 70% of the sample believed that gifted students would be self-motivated and independent learners, suggesting that they would miss children with potential who did not manifest such well-developed skill sets. Additionally, as teacher referrals are often based on rating scales that teachers complete, Peters & Pereira (2017) investigated the psychometric properties scores on several commonly used scales. They discovered that all of them, to varying degrees, failed to meet traditional fit criteria, suggesting that the scores would not yield valid inferences. These findings suggest that gifted identification should not be premised on teacher referrals alone; rather, multiple sources of referrals (e.g., parents, teachers, students) should be used, and cutoffs should be relatively liberal so that many more students are sent forward for individual assessment (Johnsen 2011, McBee et al. 2016). Worrell & Erwin (2011) also recommended using rating scales that require responding to low-inference behaviors (e.g., Does the student ask a lot of questions?), rather than high-inference constructs (e.g., Is the student curious?).

Customized local identification protocols. Another avenue for addressing the underrepresentation of low-income, minority, and linguistically diverse students in gifted assessment is to allow school districts to develop customized, local alternatives for these students. For example, McBee et al. (2012b) investigated the effects of a policy change in the state of Florida that allowed school districts the freedom to develop alternative identification protocols for low-income gifted students. Although the specifics of these alternative plans, labeled Plan B, were not reported, McBee et al. (2012b) showed via propensity analysis that school districts using the alternative plans doubled the probability that low-income students would be identified for gifted services, although these students still remained underrepresented overall. McBee (2010) found similar results for the state of Georgia.

Use of local, subgroup norms. Most schools and districts that rely on the use of standardized tests to identify gifted children set cutoffs for program participation based on national norms—typically the 90th or 95th percentile. One approach that has been recommended for identifying underrepresented students is the use of local norms (Lohman 2005a). Local norms are percentile cutoffs based on the performance of students within the same school or district, which may result in using lower cutoffs (e.g., 75th percentile). Using local norms helps to identify children with the greatest potential within a school, who may benefit from a more rigorous, advanced curriculum than is currently available. These local norms also provide a more appropriate comparison group for assessing achievement, as students are compared to others who have had similar opportunities to learn.

Peters & Gentry (2012) studied the effect of using local norms on the identification for gifted services of children who receive a free or reduced lunch. They found that, as a consequence of using local norms, more students receiving free or reduced lunch qualified for gifted services, mirroring their representation in the school population. The average achievement scores of the top 5% of students on subsidized lunch was comparable to that of the achievement of the top 25% of students in the school, suggesting that students identified on the basis of local norms may require different types of and more intense programming, at least initially.

The utility of local norms, universal screening, customized identification protocols, and early intensive programming is evident in Project Excite, a program at the Center for Talent Development at Northwestern University. For Project Excite, the Center for Talent Development invited all African American and Latinx third graders from their partner schools to be assessed (Olszewski-Kubilius & Steenbergen-Hu 2017, Olszewski-Kubilius et al. 2017). They used multiple criteria for identification and lowered the cutoff score on tests to the 75th percentile. Identified students were provided supplemental enrichment activities after school and on the weekends from third through eighth grade. When these students entered high school, they were outperforming their minority peers and their performance was almost "comparable to White students" (Olszewski-Kubilius & Steenbergen-Hu 2017, p. 206). This outcome is important, as local norms will only be useful to the extent that they allow for activities that result in identified students being able to compete on the basis of national norms as they approach the end of the K–12 education (Worrell & Dixson 2018).

Use of nonverbal ability tests. Traditional cognitive instruments have been dismissed as biased or unfair (Ford & Helms 2012), and nonverbal ability tests have been put forward as a valid alternative in some circumstances. For example, students who are English language learners (ELLs) or who have language, speech, or hearing impairments may be better able to demonstrate their capabilities on a nonverbal test (Worrell 2018). Naglieri & Ford (2003) reported that similar percentages (4.4–5.6%) of African American, European American, and Latinx students in the NNAT normative sample obtained scores at or above the 95th percentile, indicating that the traditional ability gap was not present for this nonverbal instrument. However, subsequent analyses of NNAT scores have raised questions about this claim.

Lohman (2005b) argued that the NNAT normative sample was not representative of the US population and particularly unrepresentative of ethnic and racial subgroups. Additionally, there is research evidence showing that (*a*) African American and Latinx students generally obtain lower scores than their Asian and European American peers on state tests, national tests, and ability tests, including the NNAT (see Peters & Engerrand 2016), and (*b*) NNAT scores not only have larger standard errors of measurement than other nonverbal tests, but also "overestimate the number of both high-scoring and low-scoring children," with ELLs in the primary grades scoring "especially poorly" (Lohman et al. 2008, p. 275). Although nonverbal measures may be excellent in identifying students in some STEM domains, like other assessments, they need to be used with other measures and will not solve the issue of underrepresentation (Worrell 2018).

Performance-based assessments. Another approach to the identification of typically underrepresented students is the use of performance-based assessments. VanTassel-Baska et al. (2002) developed and validated a set of performance-based tasks designed to assess mathematical and verbal reasoning ability with the specific goal of identifying more economically disadvantaged and minority gifted students within the state of South Carolina. Mathematical reasoning tasks assessed arithmetic problem solving, number concepts, logic, number theory, and spatial reasoning and visualization. Verbal tasks focused on verbal problem solving, persuasive writing, analogies, verbal relationships, letter puzzles, and verbal reasoning. Results showed that adding performance-based assessments to the state's existing identification system resulted in the identification of an additional group of students who were 12% African American and 14% low income. A 2-year follow-up study on the students revealed that those identified with the performance tasks had general performance levels below that of traditionally identified students, but their performance was near the mean of traditional students in their areas of strength (VanTassel-Baska et al. 2007). Another form of performance assessment includes the use of dynamic assessments, whereby students can show how quickly and comprehensively they have learned a new task immediately after instruction under testing conditions. Dynamic assessment has not been widely studied with gifted underrepresented students; however, the potential for expanded identification is promising (Lidz & Elliott 2006).

Use of challenging curriculum. A new approach to identifying more children from underrepresented groups is to use challenging curriculum with young learners to identify potential. Essentially, this approach reverses the typical order within gifted education of identifying students and then providing programming. For children who have had fewer opportunities to learn, challenging curriculum can offer the opportunity for students to display exceptional reasoning ability that might not be obvious in school achievement. There are several examples of the efficacy of this approach. One is the Young Scholars program (Horn 2015), in which teachers are trained to provide challenging lessons to children in the early elementary years and look for evidence of higher-level thinking and questioning (Horn 2015). Young Scholars continue to receive enrichment as they progress through the early grades, and data show that 25% of students identified in this fashion eventually qualify for their school districts' highest level of gifted programming.

Discussion

As the sections above make clear, identification is a complicated issue in part because many of the protocols are based on finding gifted students, although giftedness is fundamentally a classification decision rather than a discovery process. Gagné's (2005) focus on the top 10% and Terman's (1922) use of an IQ of 140 are arbitrary cutoffs that limit the number of identified students without distinguishing the truly gifted from the nongifted. Identification protocols used by school systems serve the same purpose: delimiting the number of students that will qualify for gifted education, often because of financial or organizational constraints, such as having only one qualified teacher. Identification is also complicated by concerns about equity, such that, despite the acknowledgment of the achievement, excellence, and opportunity gaps, there is an expectation that the demographic profile of gifted students should mirror the demographic profile of the school or school district (Johnsen 2011). Although this expectation is an important aspirational goal for the field, it cannot be met using the same cutoff scores or identification protocols until achievement gaps are eliminated, an outcome that will require ongoing and sustained efforts. As noted above, students from underrepresented groups who are identified using a variety of indicators often still perform at lower levels than their peers identified in more traditional ways (e.g., VanTassel-Baska et al. 2007), and some of them achieve comparable performance only after intensive enrichment efforts (e.g., Horn 2015, Olszewski-Kubilius & Steenbergen-Hu 2017, Olszewski-Kubilius et al. 2017).

HOW MANY STUDENTS ARE IDENTIFIED AS GIFTED AND TALENTED?

Schools typically identify students as gifted but do not specify subject area or domain. Thus, the available data on gifted students are not as precise or complete as they should be. Indeed, they exist only for gifted students in public schools. Between 2004 and 2012, the number of children in public schools in the United States increased from approximately 47.8 million to 49.8 million (Snyder et al. 2016). Of this number, 6.7% (3.2 million) were classified gifted in 2004, and 6.4% (3.19 million) were classified as gifted in 2012 (Snyder et al. 2016, 2018). By 2017, public school enrollment had increased to 50.7 million students, with another 5.2 million students attending private schools (**https://nces.ed.gov/fastfacts/display.asp?id=372**). Using 6.5% as an estimate, and assuming that the percentage of gifted students in private schools is at least equivalent to the percentage in public schools, approximately 3.7 million students are currently classified as gifted in K–12 schools. However, as reported in the previous section, the proportion of students classified as gifted differs across ethnic, racial, and socioeconomic groups.

African American, American Indian and Alaska Native, Asian American, European American, and Latinx students constitute 16%, 1%, 5%, 50%, and 25% of the school-aged population, respectively (McFarland et al. 2017), but constitute 10%, 1%, 10%, 62%, and 16% of gifted students, respectively (Off. Civil Rights 2012). As these numbers indicate, Asian American and European American students are overrepresented, and African American and Latinx students are underrepresented in the gifted student group, based on population statistics. This pattern is even more pronounced in the STEM fields. In a study of 25 specialized science high schools sponsored by the National Science Foundation (Almarode et al. 2014), researchers found that 70% of the 3,526 respondents were European American, 21.2% were Asian American, 4.6% were African American, 4.3% were Hispanic, and the rest identified as "other."

These data reveal major disparities. However, Worrell & Dixson (2018) suggested that the percentage of students in the school population may not be the appropriate comparison group to use. They argued that a viable comparison group consists of students who are performing at the advanced levels in reading and mathematics based on national statistics. Using reading level in fourth grade as the benchmark, where 2% of African American, 4% of American Indian and Alaska Native, 15% of Asian American, 11% of European American, and 3% of Latinx students are scoring at the advanced levels (Aud et al. 2010), African American and Latinx students are overrepresented, and Asian American students are underrepresented. This conclusion also holds if we use students in the advanced range in fourth-grade mathematics and students in the advanced range in reading and mathematics in eighth grade. These findings do not mean that underrepresentation is not present, only that it is a complex issue. The complexity only increases when one also considers socioeconomic status. Almarode et al. (2014) also found that the disparities in gifted students in STEM schools were associated with disparities in parental education: Nearly 57% of specialized science school graduates had a parent in a STEM-related career, and only 20% had parents who had not completed an education beyond high school. There is ample evidence that the opportunity gap affects all low-income students, contributing to lower achievement on the part of low-income, high-potential students (Hoxby & Avery 2013, Wai & Worrell 2016, Wyner et al. 2007).

Worrell et al. (2012) pointed out that the most successful talent development programs in the United States are in baseball, basketball, football, and other sports, culminating in the professional sports leagues. Moreover, individuals from groups that are underrepresented in gifted and talented programs are overrepresented in three of the major sports leagues: African Americans make up over 70% of the players in the National Basketball Association (Lapchick & Guiao 2015) and over 65% of the players in the National Football League (Gertz 2017), and over 25% of the players in Major League Baseball are Latinx (Lapchick & Salas 2015). Data from the National Collegiate Athletic Association (**http://www.ncaa.org/about/resources/research/probability-competing-beyond-high-school**) indicate that 480,000 (approximately 6%) of the eight million students who participate in high school sports will make it onto a NCAA college team. In football, baseball, men's basketball, and women's basketball, NCAA participation rates are 6.8%, 7.1%, 3.4%, and 3.9%, respectively, across Divisions I–III. In Division I schools, the numbers are in the 1–3% range (Natl. Coll. Athl. Assoc. 2017), which is comparable to or lower than the percentages of students scoring in the advanced range on mathematics and reading (Aud et al. 2010).

These statistics highlight several things. First, the percentage of individuals who can be classified as gifted in sports is comparable to the numbers identified as gifted or advanced in academic domains. Second, disproportionality is domain specific. Third, and perhaps most importantly, disproportionality in a particular domain may be driven in part by the individuals who aspire to outstanding achievement in that domain, which may in turn be related to the visibility of high achievers who are role models for specific groups.

PROGRAMMING FOR GIFTED STUDENTS

Kanevsky (2013, p. 1) noted that, "ideally, every student's education should be personalized and authentic. It should take full advantage of all of the student's potentials (academic and nonacademic), passions and interests, strengths, struggles, and preferences." In other words, much like students in special education, gifted students should have individualized education plans. Currently, educational programming for gifted students can be divided into two broad categories: acceleration and enrichment. Accelerated approaches are premised on the notion that gifted students acquire and comprehend information at a faster rate than their same-aged peers and involve moving students through the curriculum at a faster-than-normal pace. Acceleration can be grade based or subject based. Grade-based acceleration is best suited for individuals who demonstrate high general ability across subject areas; examples include grade skipping and early entrance into college. Subject-based acceleration, on the other hand, is more domain specific. For example, students may complete a year's work of mathematics in a single semester or over the summer. Alternatively, they may be placed in a higher grade level for a specific subject or complete college-level courses within a subject area in secondary school. Ultimately, the goal is to allow students to learn at a rate that is in keeping with their potential and capacity, and, as noted above, the evidence in support of the effectiveness of acceleration is extensive and robust (Assouline et al. 2015, Lubinski 2016, Steenbergen-Hu et al. 2016).

Enrichment programming involves students exploring traditional subject matter in greater depth than is typical in school or having students learn topics in disciplines that are not usually included in their school curriculum. Many current enrichment approaches are based on the three levels of the enrichment triad popularized by Renzulli (2016). As enrichment can be offered to a larger segment of the school population and sometimes to the whole school, it is considered less elitist and is more likely to be supported by individuals concerned about equity. Enrichment approaches are much more typical of what is offered in most school settings, although there is little research on the efficacy of enrichment options. Both acceleration and enrichment happen within K–12 schools and in out-of-school programs (e.g., universities, museums, etc.); the two approaches are often intertwined and used simultaneously. In circumstances where there are small numbers of gifted students and where enrichment and acceleration are not offered or viable options, differentiated instruction in the classroom is a possible alternative.

Special programming for gifted students also provides other benefits. Using data from the SMPY study, Wai et al. (2010) demonstrated that educational dosage matters, at least in the STEM fields. These researchers showed that adolescents with "a richer density of advanced precollegiate educational opportunities in STEM (a higher 'STEM dose')" (Wai et al. 2010, p. 860) had greater accomplishments in STEM fields (e.g., patents, PhDs in a STEM field, refereed journal articles) as adults. Additionally, participating in both enrichment and accelerated classes resulted in gifted students being introduced to communities of learning, that is, learners like themselves who provide social support, resulting in lower feelings of isolation and uniqueness (Rinn 2018, Sosniak 1999).

SOCIAL AND EMOTIONAL FUNCTIONING

The social and emotional functioning of gifted students is another area of contention in the literature. Often associated with the point of view that giftedness is a trait, there is a general belief that giftedness is concomitant with social and emotional fragility and greater psychological vulnerability (Bain et al. 2006, Rinn 2018). Chung (2017, p. 94) articulated this viewpoint as follows:

> "It is increasingly recognized in the field of gifted education that giftedness is asynchronous development, which posits that the combination of advanced cognitive abilities and heightened intensity and sensitivity in the gifted population creates inner experiences and awareness that are qualitatively different from the norm. The asynchronous development of the gifted renders them vulnerable particularly in the social-emotional aspects."

Despite the prevalence of this viewpoint (e.g., Silverman 2002), it has not been supported in the research literature (Neihart et al. 2016). Perhaps not surprisingly, gifted students report higher academic self-concepts than their nongifted peers (Hoge & Renzulli 1993, Rinn 2007). However, differences go well beyond academic self-concept.

Although Terman's (1922, 1925) samples of gifted students were chosen on the basis of high IQ scores, in a follow-up study, Terman & Oden (1959) reported that the group was superior to nongifted students on social, emotional, moral, and volitional traits. Lubinski et al. (2014) reported similar findings for the SMPY samples who were chosen by way of very high mathematical or verbal ability: Participants reported high scores on flourishing, positive feelings, life satisfaction, career direction, and romantic satisfaction. In another study, gifted students not only reported higher positive outcomes, but also did not have higher levels of psychopathology than their peers (Suldo et al. 2018). In a recent dissertation, Erwin (2015) compared victimization reports in a sample of 1,444 gifted students in sixth grade to a sample of 1,444 nongifted students matched on gender, parent education, achievement, and ethnicity using propensity score analysis. Gifted students reported significantly less relational and verbal victimization, albeit with small effect sizes and a similar level of physical victimization, and fewer gifted students reported being victimized across all victimization categories. Finally, based on a review of the scant literature on the topic, Cross & Cross (2018) concluded tentatively that suicidal ideation in gifted students is equivalent to that of their nongifted peers. They also pointed out that, in the only empirical study on this topic (Cross et al. 2006), gifted students' suicidal ideation did not differ from the normative sample. In sum, gifted students, with tragic exceptions, are no more vulnerable than their nongifted peers and are likely to become happier and healthier adults.

UNRESOLVED ISSUES IN THE FIELD

As we hope we have made evident, the issue of gifted students is not a simple one, and the literature on giftedness provides both answers and additional questions. In this section, we articulate some of the unresolved issues in the field and provide our perspective on these issues.

Reconciling Multiple Definitions in Gifted Education

The question of what giftedness represents is one of the many formulations of the nature or nurture argument in psychology. On the one hand, there is the perspective that giftedness is a trait or innate ability (Galton 1869), and on the other, there is the perspective that giftedness results only from nurture (Ericsson & Pool 2016). Studies from literature on developing expertise (e.g., Hambrick et al. 2018) have challenged the role of disciplined practice or nurture as the primary discriminator between good and outstanding performance, with data suggesting that exceptional ability enhances the effectiveness of practice and contributes to greater self-management of talent development, as well as faster growth with practice and study. In keeping with this view, most of the definitions in the field reflect neither extreme; rather, they point toward the more nuanced view of potential (nature) being transformed by appropriate talent development opportunities (nurture). Potential explications of biological interactions are articulated well by Simonton (2005) and Gagné (2018), although the actual biological mechanisms are of less use to educators and individuals concerned about the process of talent development.

Subotnik et al. (2011) attempted to integrate multiple definitions in the field, arguing that potential is transformed into achievement and then expertise, and that some experts go on to become eminent due to the transformative and enduring nature of their contributions. Talent development, in its most ideal state, promotes broad exposure and enrichment in a variety of domains, with the assumption that children will find themselves attracted to and engaged in areas that they may not have encountered in the course of family or school life. Such interests, when cultivated by outstanding teachers, can serve as the beginning of talent development trajectories, ensuring more equitable access to services for a broader range of students. However, prolonged focus on global enrichment can lead to missing out on early specialization in domains such as mathematics, in which talent development can start earlier and in which this earlier start is advantageous. Thus, the empirical literature from multiple domains (Subotnik et al. 2019) suggests there is still a lot of work to do to reconcile potential, achievement, expertise, and eminence, as well as talent development trajectories in different domains, with the press for broad exposure or well-roundedness favored by the current educational system.

Underrepresentation and Achievement Gaps in Gifted Education

There are numerous questions about the issue of underrepresentation and how to solve it. Some researchers are convinced that underrepresentation in gifted education is due primarily to biased instruments and discriminatory selection practices. Others acknowledge that achievement and opportunity gaps are contributing factors, but also contend that a substantially greater number of students from underrepresented groups could thrive in gifted programs if given the chance. Warne et al. (2013), in a study of diversity within gifted programs in Utah, showed that much of the disparity in identification and participation of minority and low-income students in gifted programs was due to these students' lower achievement test scores, which may imply the lack of prior opportunity to learn. However, if opportunity to learn is the primary driver of underrepresentation, then gifted identification practices are valid and should not be blamed.

Some educators have chosen to address the preparation of low-income, minority, or ELL students with preparation programs or boot camps focused on intensive learning (e.g., Horn 2015, Steenbergen-Hu et al. 2016). We need a more extensive and robust research base to evaluate how successful these efforts are in increasing performance outcomes of underrepresented students in gifted programs, and in what domains and under what conditions they are successful. Relatedly, we also need to acknowledge the contribution of socioeconomic status to underrepresentation, as well as the lack of visible and successful role models in academic domains in comparison to some athletic and artistic domains.

Addressing Value Differences in Talent Development Domains

Talent development supports gifted youth in fulfilling their potential by evolving into creative producers or performers in adulthood. Given the association of gifted education with schooling, it can be argued that the domains of interest for talent development should be academic. However, many gifted youth, including those from underrepresented populations, want to excel in areas such as professional sports or entertainment, domains that are not the primary focus of schooling and in which it is much more difficult to succeed professionally. This disconnect raises several related questions. Should talent development, even in nonacademic domains, promote mastery of traditional knowledge, skills, and values so as to provide credentials that might make it easier to break creative boundaries? For example, does Wynton Marsalis, an outstanding classical horn player, have more opportunities to promote and perform jazz than others without classical instruction or even the ability to read music? Is it appropriate to try to change the aspirations of individuals who could be strong contributors in STEM research but are focused on gaining wealth in the financial services industry? Should any value system guide talent development?

Eminence as an Aspired Endpoint of Talent Development

Subotnik et al. (2011) defined eminence as the outcome of fully developed talent, demonstrated by some creative product, performance, or idea that changes a field or domain, and suggested that it be the ultimate goal of the talent development process. Clearly, many worthwhile contributions are being made by individuals who are not eminent but who are giving back to society in less visible ways. Given the myriad contributions of experts and the fact that a very small number of experts gain eminence, is the acquisition of expertise a more appropriate outcome of talent development? Should we focus more research on what is needed to prepare for scholarly or artistic eminence so as to prepare students to move beyond expertise?

Investing Public Funds in Talent Development

Recent policy initiatives such as funding for preschool (either by investing in targeted groups or by providing funding for all) have employed cost–benefit analyses to highlight the fiscal benefits of the policy. For example, making tuition-free preschool only available to low-income or ELL students would be more cost effective for society without decreasing preschool enrollment for families that can afford it, but this proposal is far less politically attractive than preschool for all. No cost–benefit analyses have been conducted on investing in high-ability, low-income children's education. Would such investments lead to decreased achievement and opportunity gaps, diminished financial support for children with disabilities, or more creative productive young adults?

Additionally, gifted education might gain more support from public and private funders if the focus were changed to supporting talent in specific domains that are consistent with national interests. One noteworthy example is the National Defense Education Act of 1958, when Congress funded identification and programming for STEM and select foreign language talent development. Other examples include recent investments by private foundations, as well as the National Science Foundation, in training students in coding and programming. Would the potential benefits of this approach also come with drawbacks that are too costly? For example, who gets to decide which domains are the most important, and would disciplines such as the social sciences and humanities experience even further decrements in funding as a result?

Balancing Challenge with Psychological Preparedness

Few people enjoy being criticized, but adults who are genuinely interested in improving their performance realize that feedback can be invaluable and is also essential in developing expertise. Many children do not yet have the maturity to exhibit this commitment to self-improvement. The stated goal of gifted education is to provide appropriate challenge to all students, with the intention of maximizing their motivation and effort. However, this process must begin early and be done with considerable care, or many children will not be prepared emotionally to deal with criticism, no matter how constructive. A program of psychosocial strength training, which is an integral part of elite preparation for athletes or performers, can be a useful parallel curriculum for advanced work in the academic world, but there is currently no systematic, benchmarked curriculum of this nature for use with academically talented youth.

CONCLUSION

The field of gifted education is almost 150 years old, dating from Galton's (1869) publication of *Hereditary Genius*. Since then, the nature of society has changed, and education is no longer the domain of select demographic groups. However, compulsory schooling for all has not removed barriers associated with socioeconomic status that are manifested in multiple ways, including the technology divide and the quality of the schools that individuals attend. Although gifted education is not mandated by the federal government, the notion of liberty, justice, and the pursuit of happiness for all rings hollow if gifted education is only available to individuals whose families can afford to buy houses in communities with well-resourced schools or pay for their children to go to specialized private schools and university-based programs. All of the gifted models discussed above highlight the need for quality talent development across childhood and adolescence, which requires greater federal resources. It is clear that, without this commitment, there will be fewer creative producers and performers in adulthood, a loss both to the individual and to society. It is our hope that policy makers acknowledge and act upon the consensus of psychological science regarding the resources and programming options required to give all of the nation's gifted students the opportunity to fulfill their potential.

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