

# INTERNATIONAL PERSPECTIVES AND TRENDS IN RESEARCH ON GIFTEDNESS AND TALENT DEVELOPMENT

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Before this chapter can focus on international perspectives and trends in research on giftedness and talent development, we need to clarify the meaning of central key terms. Neither common usage nor scientific parlance offer generally accepted definitions of *giftedness* and *talent* (Carman, 2013).

Most definitions fit roughly into one of four categories: psychometric definitions, performance definitions, labeling definitions, and specific giftedness/talent definitions. According to psychometric definitions, the terms apply to individuals who score well in psychometric tests (e.g., tests of intelligence or creativity). Performance definitions describe those individuals as gifted or talented who demonstrate high achievements, for instance the best pupil in a certain class or a school valedictorian. According to labeling definitions, gifts/talents are socially accorded, usually by an expert. In the case of specific giftedness/talent definitions, strengths in a particular domain (e.g., music, mathematics, endurance running) qualify a person as gifted or talented.

The lack of uniform distinctions between the terms giftedness and talent is as problematic as the sheer variety of definitions that can be found in the literature. There is no generally accepted understanding of the difference between the two. Although some researchers use both terms synonymously (e.g., Csikszentmihalyi & Robinson, 1986), others seek clear distinctions. Some researchers view talent as a hyponym of giftedness (e.g., Haensly, Reynolds, & Nash, 1986); others equate talent with potential and giftedness

with achievements (e.g., Tannenbaum, 1986; but cf. also Gagné, 2005). In this chapter we will use the terms giftedness and talent as conceptually overlapping terms (e.g., Ericsson, Roring, & Nandagopal, 2007).

Another fundamental problem of most definitional approaches is their propensity to assume that gifts and talents are personality traits. This has received a considerable amount of critical attention (e.g., Barab & Plucker, 2002; Dai, 2009; Ziegler, 2005; Ziegler & Heller, 2000). A Delphic definition avoids this problem by basing definitions of giftedness and talent on expert opinions about the probability of future learning and achievement development of a person (Ziegler, 2008). According to this probability-based approach, *talented persons* are individuals who may one day achieve domain-specific excellence. *Gifted persons* are individuals who will probably one day achieve domain-specific excellence. *Experts* are those individuals who already have achieved excellence in a specific domain.

Theoretical models and conceptions of giftedness are similarly heterogeneous (Dai, 2009; Davidson, 2009; Sternberg & Davidson, 2005). The fuzziness of giftedness conceptions also shows up in the research on gifted identification and education (Carman, 2013; Ziegler & Raul, 2000). For this reason, we will first discuss trends and cultural differences in conceptions of giftedness. We will then review recent trends in international research on gifted identification and on types of gifted education and their effectiveness.

## RECENT TRENDS IN CONCEPTIONS OF GIFTEDNESS AND TALENT DEVELOPMENT

For a long time now, many giftedness researchers have taken monocausal approaches to giftedness, equating it with high intelligence. Although Terman's (e.g., Terman & Oden, 1947) longitudinal study is a well-known early example, the practice continues into this century (e.g., Deary, 2006; Rost, 2009). Since the early 20th century, researchers have investigated whether individuals with an unusually high IQ (most often defined as at least two standard deviations above the mean score) went on to exceptional achievements. Researchers failed, however, to establish an unambiguous link between IQ and outcomes such as exceptional career success or domain-specific excellence. Instead, studies revealed that high IQ and various contextual variables are confounded. Holahan, Sears, and Cronbach (1995), for instance, showed that the career paths of a randomly selected sample of individuals, who were comparable to Terman's original study participants only in terms of socioeconomic status, were just as successful as Terman's participants (independent of their IQ).

Such findings compelled researchers to rethink their scientific conceptions of giftedness with the aim of more accurately capturing reality. Resulting changes included (a) an increase in the complexity of giftedness conceptions, (b) a more thorough consideration of contextual factors, (c) a stronger orientation toward processes and actions, and (d) a shift from a deficit to a resource orientation, among others.

A first reaction to the failure of monocausal conceptions to predict achievement excellence exclusively on the basis of high intelligence, exceptional past achievements, or exceptional learning behavior (Worrell, 2009; Ziegler, 2008) was to *increase the complexity level* of giftedness conceptions. These efforts led to multidimensional models of giftedness (Heller, Mönks, Sternberg, & Subotnik, 2000; Sternberg & Davidson, 2005). Rather than describe individual models, we will focus on similarities between these models (see Chapters 10, 15, and 17, this handbook). All multidimensional models expand the focus of monocausal conceptions of giftedness via intelligence,

achievement, or learning behavior to include additional dimensions. In many cases, these additional dimensions involve other personality traits such as creativity or motivation and in some cases contextual factors. The fundamental assumption underlying such conceptual extensions is that achievement excellence can be exhibited in various forms and that it is the result of bundles of causal factors.

The multidimensional models fail to specify the interdependencies among considered factors and moderators, however. This is where systemic theories of giftedness come into play (Csikszentmihalyi, 1998; Jeltova & Grigorenko, 2005; Ziegler & Phillipson, 2012). These theories consider interactions between various individual factors and their compatibility, as well as interactions between sets of individual and contextual factors and their compatibility. Attempts at clarifying these relationships increase the complexity of earlier multidimensional conceptions of giftedness. Indeed, in systemic models, giftedness is no longer situated in the individual. It exists only in the system of the individual and the environment.

By considering such interactions, systemic giftedness theories—as well as some multidimensional giftedness models—reflect another change, a *greater awareness of context* (Plucker & Barab, 2005; Stoeger & Gruber, 2014). In multidimensional models, however, person and context are crucially seen as independent variables rather than as an integrated system (Snow, 1992). Theoretical and empirical publications have begun to appear that try to systematize supportive contexts in particular talent domains and that analyze the role of contexts and relevant persons within them (e.g., coaches, mentors, parents) for giftedness and talent development (e.g., Pfeiffer, 2013; Subotnik, Edmiston, Cook, & Ross, 2010; Ziegler, 2009).

Another change in giftedness conceptions involves a stronger *process or action orientation*, in which researchers shifted their empirical focus from personality traits to the learning and developmental processes that lead to achievement excellence (e.g., Ericsson, Charness, Feltovich, & Hoffman, 2006; Jeltova & Grigorenko, 2005; Sternberg, 2007; Ziegler, 2005). The object of inquiry in the most popular approach that follows this trend,

the expertise approach, is the individual who has already achieved at exceptional levels in a certain talent domain. Researchers conduct a systematic, often retrospective examination of the characteristics and prototypical learning pathways of such individuals (experts). Findings have provided important insights into the ways in which the learning processes of experts and average achievers differ (Ericsson et al., 2006). Expertise research has also shown that considerable quantities of intensive, highly structured practice (deliberate practice) are a crucial factor in determining achievement excellence (cf. Macnamara, Hambrick, & Oswald, 2014). Although there are some studies that focus on environmental agents involved in expertise development (e.g., Stoeger & Gruber, 2014), the expertise approach, as it is usually carried out in research, can be viewed as a new sort of monocausal conception of giftedness (Ziegler, 2008). It is unlike early monocausal views, however, in that it avoids essentialist giftedness notions. It nevertheless represents a strong focus on one factor. At the same time, numerous giftedness researchers have come to the conclusion that the deliberate-practice framework can be fruitfully integrated into newer conceptions of giftedness (Dai, 2009; Ericsson et al., 2007).

The trend toward process or action orientation is also evident in conceptions that more clearly reflect giftedness research (e.g., Jeltova & Grigorenko, 2005; Sternberg, 2007; Ziegler, 2005). An example is the actiotope model of giftedness (Ziegler, 2005). Here, too, learning actions, not personality traits, are at the conceptual forefront. The development toward domain-specific excellence is understood as a gradual expansion of the individual action repertoire. The action repertoire is situated in a complex system of various individual and contextual components. A successful development of the action repertoire enables domain-specific high achievement—but action-repertoire development is only possible when all system components interact in an appropriate way with one another.

The *shift from a deficit to a resource orientation* in conceptions of giftedness is also worth noting. Myths, such as that of the crazed genius (Stoeger, 2011), are indicative of a deficit orientation in giftedness conceptions. The assumption that gifted

individuals displayed frequent behavioral problems or were even “crazy”—known as the *divergence hypothesis* (Stoeger, 2011)—was the point of departure for Terman’s longitudinal study (Holahan et al., 1995, for details about Terman’s study). After reading about Sir Francis Galton’s research, Terman was intrigued (Mönks, 1981) by the question of whether high intelligence correlates, in the sense of the divergence hypothesis, with negative physical and psychological characteristics. The results of Terman’s study showed clearly that highly intelligent children did not have a greater propensity for the sorts of inauspicious traits or behaviors foreseen by the divergence hypothesis. These findings have been replicated numerous times over the past 90 years (e.g., Rost, 2009). Not only did studies refute the divergence hypothesis (e.g., Freeman, 2001), they actually found evidence for above-average psychosocial functioning among highly intelligent individuals (Stoeger, 2009). With these results in mind, newer conceptions of giftedness have rejected the deficit approach, focusing instead on resources and talent development (Heller et al., 2000; Shavinina, 2009; Sternberg & Davidson, 2005).

## CULTURAL DIFFERENCES IN CONCEPTIONS OF GIFTEDNESS

It is generally recognized that giftedness and intelligence conceptions are culturally embedded (e.g., Neisser et al., 1996; Sternberg, 2007). Accordingly, numerous publications offer insights into non-Western conceptions of giftedness (Phillipson & McCann, 2007) and intelligence (Niu & Brass, 2011). Providing an overview of the variety of existing conceptions throughout the world is not possible within this chapter. Therefore, we will illustrate the richness of cultural conceptions of giftedness in an exemplary manner by briefly describing large-scale East–West differences in giftedness conceptions and providing exemplary insight into the cultural variety within sub-Saharan conceptions of giftedness. East Asian conceptions offer a good starting point for this discussion as the region has received a good amount of attention by researchers contrasting Western with non-Western notions. A consideration of examples of sub-Saharan

conceptions offers a reminder that large-scale generalizations can overshadow important differences.

### East Asian Versus Western Conceptions of Giftedness

Perhaps the most established vein of research on non-Western conceptions of giftedness has focused on East Asia (e.g., Phillipson, Stoeger, & Ziegler, 2013; VanTassel-Baska, 2013b). One reason may be the interest of educational psychologists, education researchers, and economists in understanding the nature of East Asian strengths in education and learning (Wang & Lin, 2005).

East Asian conceptions of giftedness typically are less concerned with the sorts of entity theories of giftedness on which traditions of gifted identification and education were originally founded in the West (Dai, 2009; Stoeger, 2009). This difference may be motivated by heightened East Asian concerns with educability (Cheng, 1998), more collectivist social perceptions in rice-cultivating parts of East Asia (e.g., Talhelm et al., 2014), and Confucian holistic outlooks (Phillipson, 2013) as opposed to the mind–body dualism of Western Enlightenment thought (Barab & Plucker, 2002).

The greater cultural affinity in East Asia for interdependence (Chinese Culture Connection, 1987), malleable views of learning (Cheng, 1998), and special emphasis on effort (Li & Fischer, 2004) create a remarkable intersection between widespread views of high ability in East Asia and recent scientific giftedness conceptions in the West. For example, systemic models of learning and rigorous deliberate practice routines have been noted for gifted education (Phillipson et al., 2013) and education in general (Rao & Chan, 2010). Although East Asian approaches to studying and providing gifted education reflect developments of recent decades and, to a certain extent, adaptations of Western trends (Phillipson et al., 2009; Vialle & Ziegler, 2015), the recent Western scientific reconceptualizations of giftedness and talent development may align newer Western giftedness conceptions more closely with long-standing East Asian outlooks (Nisbett, 2003; Phillipson & Yick, 2013; Stoeger, 2013). At the same time, however, equating East Asian high achievement with Western giftedness conceptions is problematic

because of the restricted focus of East Asian academic high achievement (McInerney, 2013).

### The Emic Complexity of Culturally Specific Giftedness Conceptions: The Example of Sub-Saharan Conceptions of Giftedness

More general statements about Western, Asian, Islamic, or African conceptions of giftedness should be made with caution (Phillipson, 2007b). They may offer a useful way of structuring international discourse on giftedness and avoiding a bias toward historically rooted Western preoccupations. Yet, even within shared geographical, cultural, and linguistic contexts, a great deal of variety exists that might be easily overlooked when viewing cultures or regions in a culturally universal (etic) manner (King & McInerney, 2014). In fact, values, which make up a crucial aspect of culturally specific giftedness constructions (e.g., Ngara & Porath, 2004), are known to vary more within than between cultures (Schwarz, 2014).

Sub-Saharan Africa, for example, presents a tapestry of unprecedented cultural and linguistic richness and diversity. Among the backdrop of Africa's cultural variety, the application of a single concept of giftedness would be unthinkable (Ngara & Porath, 2014; Taylor & Kokot, 2000). Although general assertions suggest that African giftedness conceptions may typically include a strong family and community orientation (Eriksson, 2006; Maree & van der Westhuizen, 2009), studies of specific cultural groups remind researchers of the depth of cultural differences throughout the continent. Empirical research tells us, for example, that Shona culture in Zimbabwe associates gifted behaviors more strongly with men (Ngara & Porath, 2004), whereas Kenyan respondents envisioned men and women almost equally often when asked to draw an intelligent person (Aljughaiman et al., 2012).

### RESEARCH REVIEW

Before we present recent trends in gifted identification and in research on the provision and effectiveness of gifted education, we will briefly discuss findings on Western and, in particular,

Anglo-American bias in giftedness research as well as the shortage of cross-cultural studies. This should remind readers of the necessity of considerably more development toward truly international, cross-cultural, and culturally sensitive perspectives in research in the field, which would, among other things, enable the practice of gifted education to become more culturally inclusive (Phillipson, 2007a).

### Western Bias and Shortage of Cross-Cultural Research

A bibliometric examination of giftedness research publications of the last 5 years confirms the continuing existence of a Western bias in the field. A search in PsycINFO for research articles published in peer-reviewed journals between January 2009 and August 2015 containing the terms *gifted* and *identification* in their abstracts yielded 100 citations. We selected this combination of terms on the assumption that identification, as a central concern of giftedness research overall (Carman, 2013), should offer a reasonable proxy of giftedness research in general. Although these 100 journal articles reflected research conducted in 32 countries, a strong Western bias was evident: 84% of the locations where the studies were conducted were in Western nations (America, Europe, and Australia), 10% were in East Asia, 4% were in Islamic countries, and 2% were in South East Asia and India.<sup>1</sup> With few exceptions, most research is being conducted at Western institutions with Western subjects.

The necessity and potential of cross-cultural giftedness research has been apparent for decades (Hernández de Hahn, 2000; Maker, 1993; VanTassel-Baska, 2013a). Although the fields of cross-cultural psychology and education studies have laid theoretical and methodological groundwork (King & McInerney, 2014) that giftedness

researchers are starting to use (Campbell, Tirri, Ruohotie, & Walberg, 2004), only few cross-cultural studies exist that make comparisons of giftedness conceptions, gifted identification strategies, and gifted education provision. For the period between January 1980 and August 2015, 10 peer-reviewed journal articles are recorded in PsycINFO that contain *gifted* as a title word and *cross-cultural* among listed key concepts; all of these articles were published after 2001.<sup>2</sup> Even when one considers that our search was cursory and did not include all possible relevant terms, the numbers strongly suggest that there is still an enormous potential for growth in this area before the practice of giftedness research fully reflects established theoretical insights about the cultural embeddedness of giftedness conceptions.

### Trends in Gifted Identification

Ideally, identification approaches should reflect current scientific conceptions of giftedness. For example, should identification be based on a monocausal conception in which giftedness is equated with high IQ, then the identification of gifted persons should result from IQ testing. If, however, a multifactorial or systemic conception provides the theoretical basis, then individual and contextual factors must be integrated into the identification process and, depending on the conception, also into the developmental processes (Pfeiffer, 2015; Sternberg & Subotnik, 2000; Ziegler, 2008). Despite these expectations, neither increased complexity of giftedness conceptions nor trends toward greater consideration of contexts, processes, and actions are reflected by current approaches to gifted identification. Rather, a conceptual chasm divides the theoretical assertions of conceptions of giftedness from identification approaches—in practice and in research. Most

<sup>1</sup>To ensure that our findings were not reflecting an avoidance of the term *gifted* by researchers in some cultures, we repeated the search using a title search and with synonyms for gifted as provided by the PSYINDEX Thesaurus. For inclusion, the peer-reviewed article needed to include *gifted*, *exceptional*, *talented*, *high ability*, or *intelligent*, and *identification* in its title. The results of this search were even more strongly biased toward North America and other Western cultures.

<sup>2</sup>We conducted a similar search in the second key database of giftedness research (Carman, 2013), the Education Resources Information Center (ERIC), and achieved similar results—although differences in database structure prevented us from making an exact comparison with PsycINFO. For the same period (January 1980 to August 2015), ERIC reports 12 peer-reviewed journal articles that contain *gifted* as a title word and *cross-cultural* in the abstract. These findings reflect a minuscule portion of all journal articles focusing on giftedness. Together, PsycINFO and ERIC report 7,879 journal articles between January 1980 and August 2015 containing *gifted* in their title. Finally, we repeated the searches as described but used *talent development* instead of *gifted*. This final search resulted in only six peer-reviewed journal articles (two in PsycINFO and four in ERIC).

identification regimens rely on one diagnostic criterion, most often IQ or achievement as measured by grades or standardized tests (e.g., Carman, 2013; Worrell, 2009; Ziegler, 2008).

This simplification creates various problems. First, we can assume that more complex conceptions of giftedness and identification strategies will better reflect reality. Limiting predictors of future achievement excellence to intelligence or achievements must, therefore, be viewed with skepticism (Worrell, 2009; Ziegler, 2008). Studies comparing the predictive power of individual predictors versus a combination of predictors of future achievements and learning success confirm this (Lohman, 2009). Second, identification processes that also consider contextual factors are less biased against children from families with a lower socioeconomic status and can be more easily adapted to other cultural contexts (Lohman, 2005, 2009; Sternberg, 2007; Stoeger, 2013). Consideration of contextual factors during identification also helps to ensure that children identified as gifted are truly outstanding within the norms of their respective sociocultural milieu (Sternberg, 2007). Third, the more developmental and learning processes are included within identification, the easier it becomes to apply identification results to improve the effectiveness of learning and talent development efforts (Grigorenko & Sternberg, 1998; Kanevsky, 2000).

From a theoretical standpoint, four approaches to giftedness diagnostics can be distinguished (Ziegler, 2008): status oriented, intervention oriented, development oriented, and support oriented. *Status-oriented diagnostics* is the most traditional approach. It aims to identify gifted individuals by specifying the relative position of each person within a population. The assumption behind this approach is that higher values for desirable individual characteristics (e.g., IQ, achievements, effective information processing)—in some conceptions combined with indicators of an auspicious environment (e.g., parenting style, parents' educational achievement)—predict exceptional achievements. Here, too, the assumption is that predictive strength can be improved through the combination of predictors.

Nevertheless, status-oriented diagnostics remains strongly focused on high intelligence, and this is the point of departure for *intervention-oriented diagnostics*. As described previously, early longitudinal research clearly showed that not all individuals who were diagnosed as gifted on the basis of an IQ criterion went on to make exceptional achievements later in life (e.g., Deary, 2006; Terman & Oden, 1947). However, rather than rejecting the giftedness conception as a result, researchers integrated the concept of underachievement as an explanation for potential that was not transformed into exceptional achievements (Stoeger, 2009). The introduction of this construct of lower-than-expected achievement was often operationalized as the discrepancy between IQ and achievements and led to a different diagnostic focus. Instead of contemplating predictors of achievement excellence, researchers became more concerned with the question of why achievement potential was not being fulfilled. The most frequently discussed causes are insufficient motivation, incommensurate learning and working behavior, motor-skills deficits, specific personality factors, sociocultural factors, and inadequate educational support or resources (Reis & McCoach, 2000). These variables constitute the focus of intervention-oriented diagnostics.

The *development-oriented diagnostic* approach arose, in turn, as a reaction to dissatisfaction with the focus on deficits in the intervention-oriented approach. In addition, the development-oriented approach also transcended the status-oriented approach by focusing more on achievement development. The goal of the approach is to make the best possible prognoses for individuals' continued achievement development. A hallmark is that changes in achievement development feed back into the diagnosis. In other words, an individual's future achievement development is being predicted on the basis of all cumulative achievement on an ongoing basis. What constitutes a gift is dependent on the current developmental stage and learning behavior, not on an IQ (Subotnik & Jarvin, 2005).

Passow (1981), an early advocate of the development-oriented diagnostic approach, viewed giftedness not as a fixed state but rather as dynamic. He rejected the standard two-step approach

involving an IQ test followed by an assignment decision (e.g., to a gifted class). Instead, he suggested that persons who were identified during initial testing as potentially gifted should be placed in a stimulating environment (an enrichment environment) to see how well they fare (see also Renzulli, 1986; Stanley, 1996). This approach effects changes in the diagnostic sources and the identification approaches. Instead of personality traits, learning behavior as well as concomitant cognitive, emotional, and motivational processes are diagnosed. Another crucial development here is the setting: Rather than the often artificial clinical environment of status-oriented diagnostics (e.g., a clinician's office), development-oriented diagnostics often occurs in authentic learning settings such as classrooms.

*Support-oriented diagnostics* goes further still by actively constructing developmental chances for individuals. The goal is to identify ways in which an individual's development toward high achievements and excellence can be facilitated. In this approach, gifted identification and education are no longer viewed as separate activities. A learning path toward achievement excellence is constructed on the basis of various types of diagnostic information. Then, as this path is being traversed by a learner, the diagnostic process continues and its results are used to continually adapt and improve the learning path (Ziegler & Stoeger, 2004). The process relies on numerous classes of information. The diagnostic process systematically considers individual aspects (e.g., learning behavior, cognitive abilities, goals, concentration) and contextual variables, as well as how the individual uses learning opportunities within the learning environment and deals with setbacks. Thus, stakeholders in an individual's development, such as parents, teachers, and mentors, become part of the diagnostic process.

Just as a unified conception of giftedness does not exist, a unified model of identification is also lacking. However, an identification model does exist, which can encourage a more scientific application of existing conceptions during identification. The ENTER model provides a theoretically underdetermined identification framework that can be implemented with various conceptions of

giftedness—as well as for various identification purposes and in different cultures (Stoeger, 2013; Ziegler & Stoeger, 2003, 2004). The model's acronymically derived name denotes its phases (explore, narrow, transform, evaluate, and review). The model does not describe one “right” approach for identifying gifted individuals, instead it outlines a general heuristic procedure. During the first three phases, various types of data on various types of information are collected. Each phase has a particular focus: for the explore phase, it is the individual and, depending on the giftedness conception, her or his (systemic) embeddedness in an environment; for the narrow phase, it is the identification of a suitable talent domain; and for the transform phase, it is the identification of a learning path to domain-specific excellence for the individual.

The final two phases ensure the quality of all diagnostic and counseling work. During the evaluate phase, diagnosticians assess whether the immediate goal for an identification procedure (e.g., successfully skipping a grade) was actually reached. In the review phase, a primary focus is on considering the immediate identification goal post hoc within the larger context of the entire process of developing achievement excellence. What might occur, for instance, is that the goal of successfully skipping a grade was achieved, but that further consideration during the review phase might bring to light that a different educational measure would have been more appropriate for the long-term goal of achievement excellence. Furthermore, the review phase includes an assessment of the giftedness model on which the identification procedure is based.

### Trends in Gifted Education Provision

Comprehensive data about the exact nature of gifted and talented programs are lacking (e.g., Bhatt, 2011; Ziegler, Stoeger, Harder, & Balestrini, 2013). Meta-disciplinary reflection (Dai, Swanson, & Cheng, 2011; Subotnik, Olszewski-Kubilius, & Worrell, 2011) suggests that the most common measures of gifted education provision are curriculum acceleration and enrichment (including extra-curricular activities), often involving differentiation and grouping practices. Although the cited findings may mostly reflect circumstances in the United States,

descriptions of gifted education in other cultures paint similar pictures (e.g., Chandler, 2013; Phillipson et al., 2009; VanTassel-Baska, 2013a). Therefore, gifted education provision remains focused on a narrow selection of traditional Western approaches.

A look at research on the effectiveness of these measures provides yet more justification for viewing this continuity critically. At the level of specific models and programs of gifted education, findings on effectiveness are still limited (Callahan, Moon, Oh, Azano, & Hailey, 2015; Subotnik et al., 2011). Studies on the broader categories of acceleration and enrichment are more numerous, although only somewhat encouraging. Despite frequent consensus about the effectiveness of accelerative measures (Colangelo & Assouline, 2009; Steenbergen-Hu & Moon, 2011; Subotnik et al., 2011), unclarified moderator effects limit our understanding of whether and how well acceleration is serving particular groups (Steenbergen-Hu & Moon, 2011); and in the case of enrichment, findings regarding short- and long-term effectiveness are inconclusive (e.g., Aljughaiman & Ayoub, 2012; Hany & Grosch, 2007; Reis & Renzulli, 2010; Subotnik et al., 2011). Finally, for the United States, large-scale surveys of gifted and talented programming as a whole (i.e., without differentiation according to program types or offerings) have recently raised doubts about the net efficacy of gifted and talented education overall (Adelson, McCoach, & Gavin, 2012; Bhatt, 2011; Bui, Craig, & Imberman, 2014).

Gifted education research in general has been identified as a hybrid field of scientific inquiry characterized by peripatetic researchers whose focus may shift in and out of gifted education (Dai et al., 2011) and whose methods frequently fail to fulfill widespread standards of scientific inquiry (Ziegler & Raul, 2000). Although methodological improvements have been observed for work of the past 15 years (Warne, Lazo, Ramos, & Ritter, 2012), gifted education research still compares poorly on the standards found in the larger field of education research, psychology, and the social sciences. Methodological shortcomings including lacking or inappropriate control-group designs, an avoidance of complex statistical methods, frequent references to

*p* values as equal to or less than 0, and misapplications of Cohenian effect-size benchmarks—all documented for giftedness research of the past decade (Matthews et al., 2008; Steenbergen-Hu & Moon, 2011; Warne et al., 2012)—continue to cast doubt on the field's success at gauging the effectiveness of gifted education provision.

## FUTURE CONSIDERATIONS AND DIRECTIONS

We conclude by mentioning two trends that are likely to change how education systems and societies provide gifted education in upcoming decades. First, computer-mediated communication may soon unlock the potential of mentoring for ever larger groups of gifted children. Although it has long been known that mentoring can be highly effective, its effectiveness depends on how it is carried out. Effective mentoring is expert mentoring (Eby, Allen, Evans, Ng, & Dubois, 2008). Although the results of gifted mentoring are promising (Subotnik et al., 2011), the cost of high-quality, one-on-one mentoring (Belfield, 2003) makes implementation and expansion of mentoring programs difficult, as was already recognized for gifted education provision over three decades ago (Grassinger, Porath, & Ziegler, 2010; Gray, 1982). E-mentoring may change this. As the online mentoring program for gifted girls in science, technology, engineering, and mathematics recently described by Stoeger, Duan, Schirner, Greindl, and Ziegler (2013) demonstrates, there is good reason to expect that virtual mentoring may finally enable a more rapid expansion of high-quality mentoring for gifted learners (Lamb & Aldous, 2014).

Second, concerns about equity in gifted education—not to be mistaken with the excellence-versus-equity discussion (Dai, 2009)—have been raised (e.g., Eriksson, 2006; Harris, 2014). This is an increasingly pressing issue for gifted education. As affluent countries around the world become more socially and culturally diverse (Harris, 2014), the primary beneficiaries of gifted education—children—will need a gifted education that is ready for them and their social and cultural heterogeneity (Grantham, 2012). Achieving this is difficult, however. The underrepresentation of

minorities and the economically disadvantaged in gifted education programs reflects group achievement differences in general rather than merely shortcomings of program identification instruments (Erwin & Worrell, 2012) or teachers' expectations (Lee, Olszewski-Kubilius, & Peternel, 2010). Hence achieving a better representation of heterogeneous citizenries in gifted education means investing more effort in rooting gifted education and the models on which it is based in the outlooks and cultures of the groups it should be serving in any given culture (Grantham, 2012). This, of course, is possible, as the paradigm shift in gifted education theory toward systems views of giftedness and talent development increases pressure on policy makers and educators to constantly adjust their notions of giftedness to fit the groups they should be seeking to serve (Ziegler, Stoeger, & Vialle, 2012). In particular, a better theoretical understanding of how to examine the individual and environmental resources that coalesce to create giftedness and expertise should enable the creation of more culturally and socially adaptive forms of gifted education (e.g., Sternberg & Arroyo, 2006; Ziegler & Stoeger, 2011).

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