

Research on Giftedness and Gifted Education: Status of the Field and Considerations for the Future

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ABSTRACT: *Gifted education has a rich history and a solid if uneven research base. As policy makers and educators increasingly turn their attention to advanced students and educational excellence, the time is ripe for a dispassionate analysis of the field's conceptual and empirical strengths and weaknesses. The purpose of this special feature article is to highlight advances in theories and research related to giftedness and gifted education, note the promising areas for additional research, and propose next steps for improving the quality and utility of empirical work in this important area.*

The field of gifted education has a long history in the United States, dating back over 100 years to the establishment of schools for bright students, but education for a society's most intellectually talented students has existed, in various forms, for hundreds if not thousands of years (Missett & McCormick, 2014; Tannenbaum, 1958). The scientific study of giftedness has a more limited history, with Galton's (1869) *Hereditary Genius*, often credited as the first scientific study of high ability and achievement. Other early, seminal efforts included Hollingworth's (1926) studies of high IQ students in New York City and Terman's (1926) longitudinal study of high IQ students in California.

Funding for research on giftedness has ebbed and flowed over the decades. The federal government has funded significant work in this area, most notably during the Cold War in the 1960s and through support of the Javits Gifted and Talented Students Education Act, which included funding for a National Research Center on the Gifted and Talented (NRC/GT) beginning in the early 1990s. Research programs on gifted education developed at several major research universities around the country, and the field is presently represented by long-standing journals and professional organizations devoted to research and advocacy for gifted students and their education. The purpose of this article is to critically review the state of theory and research in the field, identify

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CURRENT STATUS OF THEORY

Conceptions of giftedness mirror theoretical progress with related constructs, such as intelligence and creativity (Plucker & Esping, 2014). For example, many early intelligence theories, whether unitary (Cattell, 1987; Spearman, 1904) or more multifaceted (Guilford, 1967; Thurstone, 1938), emphasized the importance of the individual as the unit of interest and were largely psychometrically derived. Creativity theories from that era had similar characteristics (e.g., Guilford, 1950; MacKinnon, 1965). Early approaches to giftedness followed a similar trajectory, focusing largely on psychometric, unitary conceptions, such as that of Terman (1926) and Hollingworth (1942). Many successful programs for gifted youth, such as the Talent Search programs, were initially based by Julian Stanley and his colleagues on these psychometric conceptions (Olszewski-Kubilius & Thomson, 2014; Stanley, 1973).

During the 1970s, just as theories of intelligence and creativity began to emphasize multidimensional constructs and the role of environmental influences, definitions and theories of giftedness began to change. One of the most significant developments was the first definition offered by the federal government that proposed that giftedness was manifested in six distinct areas—general intellectual ability, specific academic aptitude, creative or productive thinking, leadership ability, visual and performing arts, and psychomotor ability (Marland, 1971)—and was directly related to a need for specialized programming in schools. Callahan et al. (1995) found that nearly

50% of surveyed school districts based their gifted education identification procedures on this definition, making it the most popular definition at the time. However, that definition still focused largely on the capacity of the individual student and devoted little attention to potential environmental influences.

Soon after the federal definition appeared, broadened theories of giftedness emerged. A hallmark of these conceptions was that intelligence, largely synonymous with giftedness in earlier theories, was seen as a necessary but not sufficient condition for high achievement. For example, Renzulli's (1978) three-ring conception of giftedness, perhaps the most well-known model in the field, focuses on the interaction among above average ability, creativity, and task commitment. Renzulli and his colleagues have conducted a number of studies of the validity of the three-ring conception (e.g., Delisle & Renzulli, 1982; Gubbins, 1982; Renzulli, 1984, 1988), including studies of the effectiveness of interventions based on the model. Although Renzulli's approach is not without its critics (e.g., Johnsen, 1999; Olszewski-Kubilius, 1999), the model is often portrayed in its original form, when in actuality Renzulli and colleagues have continually refined and improved the model (see Renzulli, 2005; Renzulli & D'Souza, 2014; Renzulli & Sytsma, 2008). Perhaps the major contribution of the three-ring conception of giftedness is that it was among the first efforts to make creative productivity a goal of gifted education.

Concurrent with Renzulli's strong influence on the field of gifted education, Gardner (1983) published the Theory of Multiple Intelligences (MI Theory), and Sternberg's (1988, 1996) Triarchic Theory of Successful Intelligence emerged. Like Renzulli's three-ring conception, MI Theory and Triarchic Theory appealed to educators who wished to expand notions about how students are considered to be gifted and talented. Despite MI Theory's popularity, empirical support has been mixed (Castejon, Perez, & Gilar, 2010; Jensen, 1998; Visser, Ashton, & Vernon, 2006), and assessment has been difficult, limiting its impact on gifted education (e.g., see Gardner, 1995; Plucker, 2000; Plucker, Callahan, & Tomchin, 1996; Pyryt, 2000). Research on the Triarchic Theory has provided more empirical support in the areas of assessment and effective educational interventions (Sternberg, 2011; Sternberg, Castejón, Prieto, Hautamäki, &

Grigorenko, 2001). Renzulli, Gardner, and Sternberg's work clearly broadened educators' conceptions of what talent and giftedness can be and where it can be found. Furthermore, all three theoretical approaches also emphasize the role of socio-cultural context in defining, identifying, and fostering giftedness.

Another theoretical milestone was Gagné's (1995, 2000) development of the Differentiated Model of Giftedness and Talent (DMGT). In the DMGT, *gifts* are defined as innate abilities in at least one domain area (i.e., intellectual, creative, socioaffective, sensorimotor) that place the individual in the top 10% of age peers. Talent is the demonstrated mastery of the gift as evidenced by skills in academics, arts, business, leisure, social action, sports, or technology that place the individual in the top 10% of age peers. By proposing the gifts-talents distinction, Gagné differentiates between potential and real-world outcomes, with underachievement occurring when gifts do not translate into talents. Perhaps not coincidentally, some state definitions now differentiate between potential and actual achievement. Gagné also recognized intrapersonal and environmental catalysts, which can either support or hinder the development of talent. The acknowledgement of variables that can both hurt and help foster talents is a unique theoretical addition that mirrors earlier work by Tannenbaum (1983) and later changes to the three-ring conception (i.e., Operation Houndstooth; Renzulli, 2002, 2012).

Around the turn of the 21st century, a wave of new philosophical perspectives began to influence views of learning and talent. Many educators had grown weary of conceptualizations that described constructs, including giftedness, as being either largely cognitive or environmental. Barab and Plucker (2002) reviewed theory and research within five such perspectives (i.e., ecological psychology, situated cognition, distributed cognition, activity theory, legitimate peripheral participation) and concluded that "the separation of mind and context at the heart of traditional conceptions of talent development polarizes learner and context, either implicitly or explicitly stating that, in the case of talent and giftedness, the individual impacts or influences the environment" (Plucker & Barab, 2005, p. 204; see Corno et al., 2002; Snow, 1992, for related analyses).

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Barab and Plucker (2002) proposed an integrated model of giftedness in which talents, broadly defined, are developed through the interaction of the individual, environment, and sociocultural content. From their perspective, talent development is an ever-spiraling process, as continued interactions build on themselves over time and lead to greater opportunities to develop talent—and greater success as a result. The primary implications are that solving real-world problems, within realistic contexts and with considerable support, should be the focus of talent development programs, and that unless advanced learners have their talents fostered and remain challenged in K-12 schools, they will never develop their full potential as creative, real-world problem solvers. The situated view is more popular outside of the field than within, which is not surprising given that many gifted education programs continue to use an "identify the bright student" intervention model, against which the situated approach explicitly argues.

The latest major theoretical development is the model proposed by Subotnik, Olszewski-Kubilius, and Worrell (2011, 2012; Worrell, Olszewski-Kubilius, & Subotnik, 2012), who define giftedness as:

performance that is clearly at the upper end of the distribution in a specific talent domain even relative to other high-functioning individuals in that domain. Further, giftedness can be viewed as developmental in that in the beginning stages, potential is the key variable; in later stages, achievement is the measure of giftedness; and in fully developed talents, eminence is the basis on which this label is granted. (Subotnik et al., 2012, p. 176)

This approach deals with the potential versus outcomes issue differently than other theories, and it

explicitly states how the construct changes as people develop. Subotnik et al. also emphasize that giftedness results from a combination of cognitive and psychosocial variables, keeping with the theme of broad-based influences on giftedness that we see across many recent conceptions. Furthermore, they endorse views that intelligence is malleable and that beliefs about intelligence matter (Dweck, 1999). The practical implications of their model run parallel to their definition:

Although we recognize that the generation of creative performances or ideas requires person, process, and product, it is also the case that the relative emphasis on these factors shifts over time. For example, it is important that young children develop a creative approach and attitude (person), that older children acquire skills (process), and that the acquisition of these mindsets and process skills are then coupled with deep multidisciplinary content knowledge and are applied to the creation of intellectual, aesthetic, or practical products or performances (product). (Subotnik et al., 2011, p. 33)

This approach to interventions extends the situated view of Barab and Plucker (2002) by noting that the relative contributions of the parts of the person–environment–sociocultural interaction may vary over time and across different contexts. Collectively, the past several decades of theory, including the highly cited efforts in recent years, provide evidence that thinking about the nature and development of giftedness and talent continues to develop.

CURRENT STATUS OF RESEARCH

The literature in gifted education, as in most fields, involves theory and model generative essays, research studies, and applied/advice pieces. Within the research category, the bulk of the research in gifted education has been descriptive and correlational (Dai, Swanson, & Cheng, 2011; VanTassel-Baska, 2006). Unfortunately, whether because of the dearth of funding that would support experimental research or the difficulty in implementation of randomized, controlled studies in a field with small sample sizes, the lack of causal research leaves the field with considerable ambiguity about

effective practices. A further confounding factor in interpreting even the descriptive and correlational research is the widely varying definitions of giftedness applied in research studies and the accompanying diversity in identification of subjects across studies. The small number of intervention studies in combination with inconsistency and lack of specificity when defining giftedness has made much statistical modeling difficult within gifted education.

Regardless of these methodological limitations—and perhaps as a result of them—research on giftedness and gifted education has some well-understood aspects and well-supported interventions, other areas where advocacy tends to outstrip efficacy evidence, and yet other aspects common in the field but unsupported by research or in need of a great deal more investigation. In the following sections, we review the state of research in the field.

AREAS WHERE RESULTS CAN GUIDE POLICY AND PRACTICE

As noted above, the field does not have a large number of areas that have been comprehensively studied, but a few topics have been studied extensively, and the results can guide policy and practice related to gifted students. For example, a major concern of advocates is that the regular classroom environment, in the absence of interventions for advanced students, provides little challenge for students who already mastered the content and skill or can learn the material at an above-average pace. Prior to funding of the NRC/GT in 1991, many advocates were concerned that a lack of attention to curricular and instructional differentiation provided insufficient challenge for gifted students in general education classrooms. The first research studies produced by the NRC/GT (Archambault et al., 1993; Moon, Callahan, Tomlinson, & Miller, 2002; Westberg, Archambault, Dobyms, & Salvin, 1993; Westberg & Daoust, 2004) provided evidence across subject areas in elementary and middle schools that these concerns were warranted.

A later study by Brighton, Hertberg, Moon, Tomlinson, and Callahan (2005) extended this research and found that when teachers do differentiate their focus is on students who are struggling

to learn, holding to a belief that gifted students do not need differentiation. Reis et al. (2004) further documented the dearth of opportunities for advanced readers (those reading above grade level) to be challenged by the school curriculum. Policies based on the assumption that differentiation in the general education classroom meets gifted students' academic needs are likely to create situations in which modifications in curriculum and instruction for the gifted learner are absent. Yet differentiation within the regular classroom is one of the most common forms of programming for advanced students (National Association for Gifted Children, 2011).

Another area with a rich research base is acceleration. Schools around the world tend to be age-based, with students of similar ages progressing through their education at a fixed pace (see Mullis et al., 2011). This is based on the assumption that individuals of a similar age have had roughly equivalent opportunities to learn and educational experiences, thereby leaving them with similar content yet to be mastered. Because this assumption is tenuous at best, a range of academic acceleration strategies have been developed to address the atypical intellectual development often seen in bright students. These strategies are often placed into two categories: subject- or content-based acceleration and grade-based acceleration. In subject-based acceleration such as studying one discipline with students in a more advanced grade, curriculum compacting, allowing students to take a single college course or distance learning course, and participation in Talent Search programs, students remain with same-aged peers for other instruction. Grade-based acceleration strategies, in which students do not remain with same-aged peers, include early entrance (to kindergarten or college), grade skipping, multi-age classrooms, and early graduation from high school and college. Authors of meta-analyses (Kulik, 2004; Rogers, 2010; Steenbergen-Hu & Moon, 2011) and traditional reviews (e.g., Colangelo, Assouline, & Gross, 2004; Lubinski, 2004) reach largely positive conclusions about the academic efficacy of almost all forms of acceleration. For example, Kulik's meta-analysis estimated an average effect of nearly a year's additional academic growth for accelerated students, an effect that, as Assouline, Marron, and

Colangelo (2014) noted, compares very favorably to the effects of the most effective and popular school reform models. The research also provides evidence of social and emotional benefits for most forms of acceleration (Assouline et al., 2014; Colangelo et al., 2004), although others note that these effects can be less pronounced (Steenbergen-Hu & Moon, 2011).

Ironically, the one type of acceleration with mixed evidence of effectiveness includes the very popular Advanced Placement and International Baccalaureate programs, whose widespread use is probably due to the fact that they fit conveniently into the grade-level structure of most high schools and do not require significant organizational accommodations. Research on the benefits of such programs provides evidence that enthusiasm for the exclusiveness of this option may not be warranted, both in general (Plucker, Chien, & Zaman, 2006; Sadler, 2010) and for gifted students (Foust, Hertberg-Davis, & Callahan, 2008; Hertberg-Davis & Callahan, 2008, 2014; Kyburg, Hertberg-Davis, & Callahan, 2007). Policy based on the evidence of effectiveness of some acceleration practices and the issues that surround other practices (i.e., Advanced Placement) would provide a more appropriate range of options for gifted learners as well as comply with recommendations that gifted students be provided services that can be matched to their learning needs.

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A third area with a significant depth of research is curriculum design. Gifted education is rife with advice for developing curriculum and instructional

interventions to be used with gifted students. These models can be characterized as descriptive framework for implementation of curriculum (in which teachers use a model as a guide in developing daily lessons) or as prescriptive (in which teachers follow a predeveloped unit based on a framework or model's guiding principles). Descriptive curriculum authors may provide examples based on their model, but predeveloped units are not a part of a descriptive framework; prescriptive curriculum always provides predeveloped units for instruction.

Studies of descriptive curricular model implementation with gifted students provide limited evidence of effectiveness. Although researchers have described student growth during curricular implementation (e.g., Reis & Boeve, 2009), studies of descriptive curriculum efficacy using randomized control designs or even quasi-experimental studies are rare. One experimental study did not support the effectiveness of a model of differentiated instruction in bringing about deep change in teacher behavior or instruction or differences in student achievement (Brighton et al., 2005). In contrast, data from several quasi-experimental studies support the use of prescriptive units (Feng, VanTassel-Baska, Quek, Bai, & O'Neil, 2004; Gavin, Casa, Adelson, Carroll, & Sheffield, 2009; Tieso, 2005). The relative effectiveness of prescriptive curriculum (teachers teaching according to specific unit frameworks with lesson plans and resources specified) has been supported in randomized control studies of the implementation of language arts units based on the Challenge Leading to Engagement, Achievement and Results (CLEAR) Curriculum framework (Callahan, Azano, Oh, & Hailey, 2012), units based on the Triarchic Theory of Intelligence (Sternberg, Grigorenko, & Zhang, 2008), and mathematics units (Gavin et al., 2009). Overall, the empirical support for prescriptive unit success (units often based on the descriptive frameworks) far outweighs the support for the implementation of a descriptive framework, suggesting that programs based on prescriptive models of curriculum and instruction are more likely to produce improvements in student growth. These examples show that researchers within the field have made tremendous strides in determining the types of programming that can aid educators in planning effective interventions for advanced students.

AREAS WHERE SOLID EMPIRICAL FOUNDATIONS ARE EVOLVING

The knowledge base in several important areas is increasing, with significant developments in research regarding areas such as identification, talent development, and creativity. The deepening of the empirical foundation in these areas is also leading to better designed interventions that hold promise for advancing the field.

Perhaps the most discussed and most controversial area of concern within the field is the process of screening and identification of gifted students, in large part because traditional approaches are widely perceived to be highly biased in favor of students from some demographic groups and against those in other groups. Numerous recommendations for improving identification practice abound (see Callahan, Renzulli, Delcourt, & Hertberg-Davis, 2013), and current publications and policy development have focused a great deal of attention on the identification of historically underrepresented populations of students (African-American, Hispanic/Latino, American Indian, and students from low-income families). Indeed, several projects funded under the Javits Act were proposed to improve identification of talented students independent of their demographic characteristics. Recent identification work has focused on the assumption that "multiple measures" are more effective with respect to identifying greater numbers of identified students from minority and low-income families (Worrell, 2009). However, in a compelling study by McBee, Peters, and Waterman (2014), the authors showed that common multiple measure identification policies may not have the predicted outcome of improved identification of talent among all student groups. Simply using more measures is not as important as how those measures are actually used.

However, research on identification policies and practices has been limited, and evidence of the success of efforts to improve such practices is not overwhelming (Borland, 2014). Several lines of promising research are emerging, giving hope that identification can be turned from being one of the field's weaknesses to one of its strengths. This research is occurring at several different levels. For example, Peters and Gentry (2010, 2012a) have gathered promising criterion-related validity

evidence for a teacher rating scale as well as its use in a multicriteria identification system (Peters & Gentry, 2012b), and McBee (2006, 2010a) has conducted state-level identification policy studies that provide insight into how current and proposed state-level policies impact practice. Peters, Matthews, McCoach, and McBee (2014) have also presented an argument for the de-emphasis of identification as a barrier to most gifted programming, instead arguing that identification should be used as a means of inclusion (locating more students) as opposed to exclusion (keeping students out) and that most programs be made much more open to those who would like to challenge themselves. In combination with the new conceptions of giftedness mentioned above (e.g., Barab & Plucker, 2002; Subotnik et al., 2011), there is reason for optimism about improvements in identification practices.

Another area with impressive recent gains is the field of creativity and innovation. These constructs have become hot topics across a number of fields, including business, economics, and social entrepreneurship, to name but a few (e.g., Pellegrino & Hilton, 2012). However, much of this attention has a “we don’t know enough” flavor, when in fact the research base on identifying, fostering, and evaluating creativity has significantly deepened over the past 20 years. For example, progress has been made on defining and conceptualizing creativity (Li & Kaufman, 2014; Plucker, Beghetto, & Dow, 2004), correcting a widely acknowledged, long-standing weakness in the lack of clear, common definitions and conceptualizations of the construct. After years of debate, a consensus is emerging that creativity has both content-general and content-specific characteristics, and that efforts to foster creativity should be designed accordingly (Beghetto & Plucker, 2006; Plucker et al., 2004). Research on assessment has diversified, with serious lines of research regarding a range of measurement strategies (Kaufman, Plucker, & Baer, 2008; Plucker & Makel, 2010). And researchers have considerable knowledge about how creativity develops and can be fostered (Beghetto, 2014; Beghetto & Kaufman, 2010; Sawyer, 2011, 2012). Beghetto (2014) noted several areas in need of additional research, including linking creativity to specific academic content areas and determining the most effective ways to help prospective teachers learn to teach for creativity, but in general the

knowledge base regarding creativity in education is more advanced than most researchers and educators realize and continues to grow rapidly.

Identification and creativity are examples of areas within the field that have traditionally been criticized for poor conceptualization, thin empirical bases, mixed evidence of effectiveness, but have a number of researchers doing promising work. These lines of research provide reason for optimism that many of gifted education’s traditional weaknesses are being successfully addressed.

AREAS IN NEED OF RESEARCH

Still other areas are in need of significant further research. Researchers in gifted education, like those in many applied fields, deal with a constant tension between research and advocacy. This is not surprising: Why would someone devote a career to studying gifted students without a strong belief that addressing the needs of those students was a good and necessary activity? This tension, of and by itself, is not necessarily a bad thing, as long as researchers draw conclusions from their data and not their advocacy beliefs. However, as outside observers have noted (e.g., Richie, 2013), some of the widely held tenets in gifted education are not well supported empirically, or the evidence is quite mixed. Our sense of the field is that these issues emerge from a desire to advocate on topics with thin research bases, and that strengthening these areas of relative empirical weakness would improve the efficacy of advocacy efforts.

One example is the role of social and emotional issues in the lives of gifted children, with the range of studied phenomena being vast and varied. Conclusions in the research range from claims that gifted students have unique social and emotional needs to assurances that the social development and emotional adjustment of gifted students are equal to or superior to that of the general population. Other researchers believe that gifted students do not possess unique social and emotional characteristics, but rather that family, school, and cultural contexts influence the manifestations of traits in unique ways (see Neihart, Reis, Robinson, & Moon, 2002; Reis & Renzulli, 2004). This large body of research is strong in some areas, especially descriptive research on the prevalence and manifestation of certain constructs

within gifted populations, but weaker in others, such as the efficacy of specific interventions to help high-potential students deal with specific social and emotional issues.

For example, in a recent review, Wiley and Hébert (2014) concluded asynchrony (the degree to which the gifted child may exhibit a mismatch between intellectual, emotional, and psychomotor capabilities) has not been documented as a cause of depression; that gifted students do not require treatment to fight off the effects of low-self-concept in any domain, except perhaps the physical; and that the incidence of unhealthy perfectionism and depression in gifted students is no greater than the incidence in the general population. They also concluded that the appearance of multipotentiality (equal aptitude and achievement across multiple, diverse domains) may actually be a consequence of using assessments with low ceilings, and that even if multipotentiality does exist, gifted students who exhibit this trait do not appear to manifest less life or job satisfaction. Many of these conclusions fly in the face of practice or recommendations, such as those offered by the NAGC (2011) that educators participate in professional development to support the social and emotional needs of students with gifts and talents. Wiley and Hébert (2014) contended that this research–practice misalignment stems from a lack of systematic study of the phenomena that fall under the social-emotional umbrella, with the result that psychologists and clinicians have formulated a “collective wisdom” based on their experiences.

A similar research–practice mismatch exists regarding efforts to reduce racial and ethnic disparities in gifted program participation and improve outcomes for gifted minority students. The history of race and equity in gifted education is not particularly pleasant, although as Ford (2012) has noted, the entire, broader field of special education has historical and contemporary problems with racial and socioeconomic disproportionality as well. Despite several decades of concerted effort to address underrepresentation and narrow achievement gaps among subgroups of bright students, considerable evidence exists that underrepresentation remains a problem—and that “excellence gaps” in many cases have grown over the past generation (Plucker, Burroughs, & Song, 2010; Plucker, Hardesty, & Burroughs, 2013). Worrell

(2014), after a comprehensive review of research on racially and ethnically diverse gifted children, observed that the research base in this area is neither broad nor deep, with many unsubstantiated claims about causes of and solutions for underrepresentation, too few replications of the research that does exist, and insufficient attention to the interaction of race and socioeconomic status. However, Worrell also acknowledged that given all the literature on race and poverty in gifted education, the field’s progress in this area is disappointing.

As a case in point, one of the frequently recommended and adopted policies for addressing concerns about underrepresentation is the use of nonverbal assessments. However, current examination of the underlying validity and bias issues (Lohman & Gambrell, 2012; Worrell, 2014) and recent data on proportions of minority students identified by use of nonverbal instruments have raised questions about their effectiveness in locating more minority students (Giessman, Gambrell, & Stebbins, 2013). These findings have led to a somewhat fierce debate about whether nonverbal intelligence tests find smaller group differences than verbal tests (e.g., Lohman, 2005; Naglieri & Ford, 2003, 2005). What is not often appreciated is just how different students are in terms of academic readiness when they enter a given grade level. Because of sometimes massive differences in educational opportunity (differences that are partially due to economic inequality, which itself is not randomly distributed across racial groups), individuals from certain subgroups show lower average observed test scores. The question remains whether or not these observed differences are due to bias or do to actual differences in academic readiness. Additional research is needed to determine whether nonverbal assessments are having their desired effect on reducing underrepresentation—or possibly exacerbating the problem.

Another example of an area in need of additional research is that of ability grouping. A commonly espoused belief among gifted education scholars and advocates is that the available research clearly demonstrates the efficacy of homogeneous ability grouping over heterogeneous grouping, with demonstrated benefits regarding student achievement and self-concept across ability levels. In recent years, a number of proreform think tanks have adopted this talking point, calling for increased use

of ability grouping in schools. On the other side of the argument, critics claim that homogeneous grouping leads to a wide range of academic and social ills, including lower student achievement and self-concept, poor and underresourced education for students in lower ability groups, and even *de facto* segregation for poor and minority students (e.g., Slavin & Braddock, 1993). A major, teacher union–funded think tank even went so far as to conclude that “the vast majority of research into so-called tracking or ability grouping of students has reached a definite conclusion: it’s harmful. Students placed in low-track classes fall further behind” (Great Lakes Center for Education Research and Practice, 2013).

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It is difficult to imagine a wider range of conclusions on an issue. However, interpretations of the research are clouded by a number of issues and limitations. For example, advocates on both sides of the debate tend to use “tracking” and “ability grouping” interchangeably (e.g., Loveless, 2009; Oakes, 2005), a rhetorical issue with which most gifted education researchers take issue. Tracking involves placing students over the long term in ability groups that are difficult to leave; such tracking was used for decades to justify segregation of students by race and socioeconomic status, and as such, the use of the term to refer to contemporary ability grouping is not only incorrect but also emotionally charged. Ability grouping is a term used to represent a variety of different organizational strategies, such as between- or within-class groupings, with flexibility that allows for changes in instructional placement over time. The research bases on tracking and ability grouping are not identical, making any synonymous usage very problematic (Loveless, 1998).

That said, considerable research has been done on ability grouping, with meta-analytic studies by Slavin (1987, 1990) and Kulik and Kulik (1982, 1992) being the most cited. Contrary to most interpretations, these studies generally find small or negligible effects for ability grouping of students at all levels of ability without curricular or instructional modification. Slavin

(1990), echoing observations by Kulik and Kulik, went so far as to conclude:

The lesson to be drawn from research on ability grouping may be that unless teaching methods are systematically changed, school organization has little impact on student achievement ... if teachers continue to use some form of lecture/discussion/seatwork/quiz, then it may matter very little in the aggregate which ... students the teachers are facing. (pp. 491-492)

This is an important finding, not least because it applies to gifted students participating in other organizational reforms (e.g., Plucker, Makel, Hansen, & Muller, 2008; Plucker, Makel, & Rapp, 2008). In other words, for ability grouping to work for *any* students, appropriate instructional and curricular differentiation must occur across the ability levels. For this reason, the research suggests that decisions to implement ability grouping may be negative or positive for high-ability students, depending on how the grouping is implemented. Given that, according to some sources, the implementation of ability grouping is on the rise in American K-12 schools, the “grouping always helps the gifted” and “grouping always hurts low-performing students” fallacies should be more assertively questioned.

Slavin (1990) also raised a limitation to ability grouping research that, in the two decades since his study was published, appears to be highly relevant: A great deal of research that has been included in the major meta-analyses is decades old at this point. With an emphasis on differentiation in teacher training and professional development in recent years, instruction within homogeneous and heterogeneous ability groups may look different today than they did from the 1960s to the 1990s, when much of the cited research was conducted. Although a handful of more recent studies have been conducted with roughly similar results (e.g., Collins & Gan, 2013; Nomi, 2010), the results are not consistent relative to the benefits or deficits caused by ability grouping for all levels of student ability.

These are but three examples of areas within gifted education that need a stronger research base, yet we see these three areas as having among the best payoffs in terms of investments in research. In other words, learning more about social and emotional development of gifted students, the ways

that specific interventions can help underrepresented populations, and better knowledge of how and under what conditions ability grouping does or does not promote positive student outcomes at various ability levels would result in huge gains in the education of gifted students and the development of talent.

FUTURE POLICY AND PRACTICE

The development of policy and practice for the future will be complex in the absence of support mechanisms to support further research. The demise of Javits Act funding, including the lack of funding support for a national research center, will hamper the development of our understandings of gifted students and effective services. However, as noted above, some policies can be justified based on the evidence at hand, including acceleration and the use of prescriptive curriculum models, and other policies can be avoided, such as focusing on differentiation in the general education classroom to the exclusion of other interventions. In this final section, we offer some thoughts about how research on giftedness and gifted education can be strengthened.

NEED FOR EXPERIMENTAL RESEARCH ON INTERVENTIONS

Although several researchers have ventured into assessing impacts of interventions, the field still lacks a body of research that allows for causal inferences (Matthews, Peters, & Housand, 2012). As a result, policy makers are often left with the option of relying on collective “wisdom” or limited experimental evidence—limited in both quantity and generalizability of findings. Intervention research is costly, and current support for such research by federal and state agencies or foundations is absent. Hence, the probability that such research will be executed in the future is low.

NEED FOR ASSESSMENT THAT ALIGNS WITH OUTCOMES

One lingering issue with the studies of curricular impact is the lack of appropriate standardized instruments to measure the outcomes of the instructional units and curriculum offered to gifted students; as a result, most intervention studies are dependent on—and criticized for—the use

of experimenter-constructed instruments (e.g., Callahan et al., 2012; Feng et al., 2004; Gavin, Casa, Firmender, & Carroll, 2013; Tieso, 2005; VanTassel-Baska, Zuo, Avery, & Little, 2002). Existing standardized instruments suffer from two serious limitations for use in experimental studies: insufficient validity for this purpose because of the mismatch between the level and complexity (and sometimes topical content) of curriculum offered to gifted students and ceiling effects (Callahan, 2009; McBee, 2010b). Lack of common consensus on appropriate goals impedes the development of these measures. Some advocate for creative productivity as a goal, whereas others look for differentiation of common core standards within content domains, and others look to process goals such as critical and creative thinking. Yet others look to acceleration of content knowledge attainment as the goal for gifted students. Gifted education, quite frankly, continues to struggle with its goals, which is a major barrier for an applied field.

USE OF NEW DESIGNS AND STATISTICAL ANALYSES

The rigor of research on giftedness has increased over the past generation, with many calls to apply more sophisticated quantitative and qualitative models and techniques, especially those that provide insight into causality (e.g., Coleman, Guo, & Dabbs, 2007; Dai et al., 2011; Simonsen & Little, 2011; VanTassel-Baska, 2006). However, the most rigorous methods will not mediate design flaws, making sophistication of design a critical area for research development. For example, very few replications occur within the field, yet replicating research is a critical component of a robust, reliable research base (Makel, in press; Makel, Plucker, & Hegarty, 2012). Mirroring developments in other areas of education and the social sciences, many scholars entering the field have strong empirical skills, suggesting that the increasing rigor of research on giftedness and gifted education will continue to improve.

INVOLVEMENT OF GOVERNMENT REGARDING DATA COLLECTION

Federal and state governments expend considerable resources in the collection of achievement and

developmental data on children. Collection of data on the subpopulation of students who are identified as gifted is very limited, and what is collected is rarely reported. For example, Plucker et al. (2010) noted that press releases about the results of state and national assessments almost never address advanced performance or the scores of high-ability students. Although researchers have been able to tap into these data for limited research, more systematic efforts to structure data collection that makes analysis for this subpopulation possible would provide the field with a richer research base for documenting effects of school interventions. This need is especially acute (and would be especially helpful if addressed) due to the small sample sizes often encountered by researchers of giftedness. By definition, the student populations being studied are small, and if a particular subgroup is studied (e.g., poor, minority students of high ability), the numbers get even smaller. Access to large-scale, representative federal education data sets with appropriate variables would be a great help to researchers, assuming the data address issues related to ceiling effects and other empirical issues associated with the study of giftedness.

A VISION FOR THE FUTURE

Although advocacy by researchers is understandable, research in the field must avoid the bias of promotion. The formulation of questions and data collection strategies should reflect open consideration of possible outcomes. Furthermore, a significant portion of research on identification, processes, and models is often conducted by the developers of the models and instruments under consideration, with few third-party studies and almost no replications. Although keeping advocacy and research separate is admittedly easier said than done, it is not impossible. To best serve the field, researchers need to address issues as research questions to be examined and assessed, not as platforms for advocating a point of view or to show that their particular instrument or curriculum is effective.

If gifted education is to advance, a second issue that cannot be avoided is diversity. Many in the field talk about the need to address issues of inequity as the country becomes more diverse, but this tenet needs to be directly challenged: The country

is already diverse, and has been for some time. In order for gifted education to survive and thrive, the field needs to take several bold steps to shrink excellence gaps—and to do so by raising the achievement levels of underachieving groups, not by allowing already high-performing groups to slip.

Such bold steps in this context could include being outspoken when policies are proposed or implemented that research tells us will make programs inequitable. A recent case in point involves the gifted and talented programs in New York City. In the spring of 2013, the media was full of stories of outrage over the revelations that a testing company incorrectly scored thousands of tests that were used to qualify students for the city's gifted education programs. Yet in none of the stories about the scandal did anyone question why one of the most diverse districts in the country is using identification procedures that research tells us are almost guaranteed to produce underrepresentation of students of poverty in its gifted programs. Many in the field may be staying silent because they view having any gifted program in New York as better than having no program, or perhaps the lack of sound research on alternatives puts researchers in a position where they are reluctant to offer poorly supported options. Regardless, it is difficult to look at that situation and not feel that the field has failed many bright students in that district.

Examining new paradigms for definition, talent development, and identification in conjunction with proposed curricular and service interventions would provide policy makers with clear pathways in decision making. The values held by individuals and school district communities will always play a part in decisions about whom they believe to be gifted and what the goals of education might be, but the research recommended above has the potential to inject valuable information into education, increasing the probability that quality services will be delivered to students equitably and that resources will be more effectively and efficiently expended.

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