CHAPTER 15

TALENT DEVELOPMENT AS THE MOST PROMISING FOCUS OF GIFTEDNESS AND GIFTED EDUCATION

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As a result of Leta Hollingworth's pioneering work, gifted education has existed and been documented since the 1930s (White, 2013). That history is closely intertwined with IQ as a signifier of great potential and problem solving skills. Concurrently, adolescent programs at the turn of the 20th century focused on developing domain specific abilities, as reflected in specialized schools and tracks in engineering, science, mathematics, and the arts. Which approach has more promise and offers more opportunity for talent to flourish?

IMPORTANCE OF THE TOPIC

This chapter focuses on a conception of giftedness that encompasses five main principles in defense of domain-specific talent development. First, ability is a cornerstone of talent development, especially ability in specific domains (e.g., mathematics, music, creative writing). Second, foundational abilities are malleable and need to be developed. These developing abilities begin, peak, and end their trajectories at different ages. That is, talent in violin or mathematics may be recognizable in elementary school with reasonable accuracy, whereas potential giftedness in diplomacy or mediation skills may not emerge until adulthood. Third, to transform potential into accomplishment, opportunities need to be offered to talented individuals that match their stage of talent development, and it is important that talented individuals take those opportunities. Fourth, all individuals can benefit from psychosocial skills training or coaching to enhance their performance and confidence in risk taking. Some children and adolescents are reluctant to take opportunities when offered, which may be due to underdeveloped psychosocial skills. Fifth, in this conception of talent development, the aspired outcome of gifted education is to prepare talented youth seeking to "change the world" to transform their abilities into creative or path-breaking contributions.

Domain-Specific Abilities Matter

When gifted education relies primarily on general intelligence measures for recognition, there is a mismatch between identification and prediction of outstanding ideas, products, and performances (Dai, 2010; Tannenbaum, 1983, 1986). These gaps between prediction and fulfillment of potential have been explored for over 50 years (Cross & Coleman, 2005; Dai, 2010; Davidson, 2009; Freeman, 2010; Hollinger & Fleming, 1992; Jordan & Vancil, 2006; Simonton, 1991, 1998; Subotnik & Rickoff, 2010; VanTassel-Baska, 1989). Torrance (1993) suggested that the missing link could be creative thinking skills. His longitudinal studies using the Torrance Tests of Creativity found that high scoring individuals are exceptionally productive as adults (see also Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005; Plucker, 1999; Runco, Millar, Acar, & Cramond, 2010). Renzulli (1978) argued that a focus on identifying *school house giftedness* (high achievement and high standardized tests of ability) blinded researchers to the contributions of individuals with exceptional creative thinking skills and also to motivation and drive as factors that

http://dx.doi.org/10.1037/0000038-015
APA Handbook of Giftedness and Talent, S. I. Pfeiffer (Editor-in-Chief)

predict outstanding productivity in adulthood (see Chapter 12, this handbook).

Other important contributors framed domain specific ability as the early primary factor in prediction of adult giftedness, and we find these arguments most compelling (see Subotnik, Olszewski-Kubilius, & Worrell, 2011). Tannenbaum (1986, 2009) and Bloom (1985), along with Feldhusen (2005), Lubinski (2010), Macnamara, Hambrick, and Oswald (2014), Pfeiffer (2012), Sosniak (1985a, 1985b), Subotnik and Jarvin (2005), and Winner (1996), asserted that although general ability measures may be helpful, particularly with young children when abilities are more diffuse, patterns of specific abilities prove to be more reliable predictors of adult success.

According to Tannenbaum (1983), reasonably high general ability (the amount needed varies with how much demand the domain puts on verbal and quantitative abilities; see also Park, Lubinski, & Benbow, 2008; Ruthsatz & Urbach, 2012), domain specific abilities, opportunity, psychological variables associated with motivation, and an ability to capitalize on chance factors lead to fulfillment of talent. Tannenbaum (2009) maintained that someone with a high IQ and no special abilities might be the equivalent of an excellent cocktail conversationalist, witty but superficial and not particularly productive. He also argued that although chance is often associated with luck, many careers were launched by gifted individuals who were prepared to fill a need with their domain expertise during a chance opportunity.

The use of specific abilities for initial identification is more widely accepted in performance fields, and research supports their use in sports (e.g., tactical skills in field hockey: Elferink-Gemser, Visscher, Lemmink, & Mulder, 2007; demonstration of flexibility and physical memory in dance: Subotnik & Feld, 2002). In music, signs of vocal abilities (e.g., timbre, intonation, musicality) have been studied by Watts, Barnes-Burroughs, Andrianopoulos, and Carr (2003), and instrumental music talent has been distinguished by pitch perception and audiation (Freeman, 2000; Ruthsatz, Detterman, Griscom, & Cirullo, 2008).

Bloom (1985) and his colleagues (e.g., Sosniak, 1985a, 1985b) ignored IQ entirely, seeking instead to find overarching factors that support the growth of elite gifts in domains, while also addressing factors unique to each domain—most particularly in sport, visual and performing arts, and academic scholarship. One important implication we draw from the Bloom study is that talent development begins by "falling in love" with an idea or topic within a domain, or even with the domain itself. For that to happen, a child or adolescent needs exposure to the domain. If the child's family participates in and values this domain, the likelihood of falling in love through contact with domain experiences and positive reinforcement is increased (Almarode, Subotnik, Crowe, Tai, & Kolar, in press; see also Chapter 30, this handbook). Given the likelihood that most children with talent potential will not be born into families with interests and expertise that complement their own, enrichment opportunities need to be provided widely by schools and communities to optimize matches between these opportunities and the interests and talent potential of children.

With less focus on IQ and more focus on special abilities, the field can expect that some members of the education community and the public will speculate that given enough domains under consideration, everyone can be gifted in some way. Although conceptually possible, not all domains are equally valued and not all domains will elicit a significant investment of time and money on the part of society and the education establishment. Clearly, however, a talent development approach is more likely to serve a wider range of children and youth than those selected only as "globally gifted."

Domain Trajectories Vary in Their Beginning, Peak, and End

The notion that ability is malleable is derived from models such as Sternberg's (1985, 1986, 1998), and from theories of motivation, most particularly mindsets and grit (Duckworth, Quinn, & Tsukayama, 2012; Dweck, 2006; Nicpon & Pfeiffer, 2011; Subotnik, Robinson, Callahan, & Johnson, 2012; Worrell, 2012). According to Sternberg (1998, 2000, 2001), abilities will transform into competencies, and competencies into expertise in response to opportunity and motivation. The trajectory of

talent can be extended beyond expertise with the force of extraordinary drive and commitment, guidance from domain experts and gatekeepers, and chance opportunity, and transformed into creative productivity, or even eminence (Subotnik & Jarvin, 2005; Subotnik et al., 2011; see also Chapter 18, this handbook).

According to Bloom (1985) and his colleagues (e.g., Sosniak, 1985a, 1985b), the trajectory of elite talent development is supported by patterns of teaching and mentoring that parallel the pathway from ability to competence to expertise and beyond. As mentioned previously, in the first stage of Bloom's model, a child first falls in love with some topic or idea within a domain. This love may initially derive from a desire to please an important adult (e.g., teacher, parent), but it also may be an expression of genuine intrinsic interest. The playfulness associated with this initial romantic interaction with a domain is replaced over time with a desire to take on a domain identity (e.g., viewing oneself as an athlete, scientist, or creative writer; see also Casey & Caudle, 2013; O'Brien, Albert, Chein, & Steinberg, 2011; Somerville, 2013). Achieving this identity requires mastery of skills, knowledge, values, and the culture associated with the domain. Acquiring expertise can be tedious at times, and requires considerable persistence. The reward for persistence is achieving a sense of belonging, a venue for creative expression, and a potential clear path toward a future creative career. The third stage of Bloom's talent development model is one that is associated with high-level psychosocial skills and extensive coaching with the objective of achieving notable creative productivity through one's own niche or "voice."

The domain specificity of talent is exemplified by differences in when domains begin, peak, and end (see Figure 15.1). Because of this variation, there is no single age at which to identify giftedness across domains. Feldman's (1986) theory of coincidence provides criteria for identifying domains where abilities can be demonstrated especially early. These domains, where prodigies are known to exist, tend to be highly structured and sequential, with instruction available to young children (e.g., music, math, chess). The existence of prodigies in a limited number of academic domains like math may highlight the earliest starting point for a domain trajectory in the academic realm. Biographical and historiographical literature support the notion that math and other mathematically heavy domains tend to have earlier peak points for eminent contributions than domains that depend more on the acquisition of behavioral insight (Simonton, 1996, 1997). For example, neither academic nor clinical psychology is renowned for child prodigies, nor is the profession of diplomacy (see Chapter 18, this handbook).

The starting and ending points of a trajectory are most obvious in performance domains where

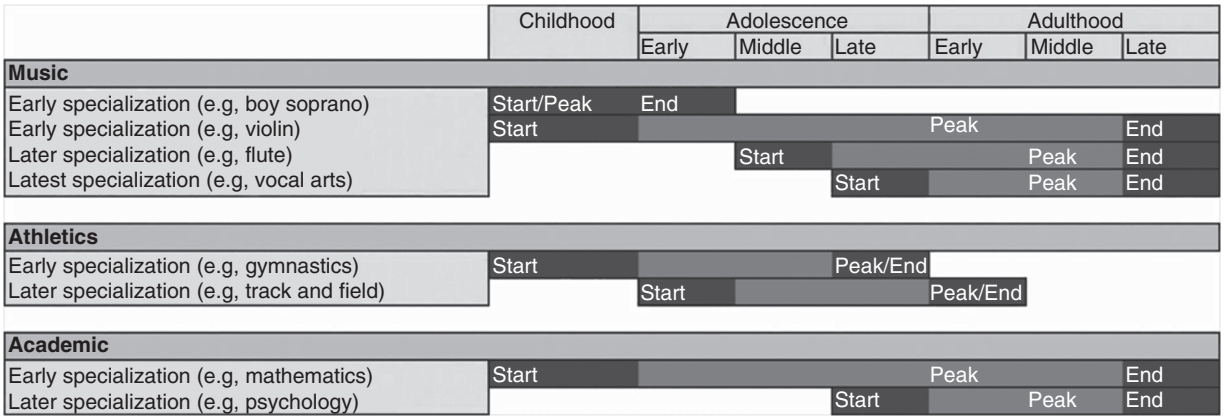


FIGURE 15.1. Trajectories for different talent domains. From "Rethinking Giftedness and Gifted Education: A Proposed Direction Forward Based on Psychological Science," by R. F. Subotnik, P. Olszewski-Kubilius, and F. C. Worrell, 2011, *Psychological Science in the Public Interest, 12,* p. 32. Copyright 2011 by R. F. Subotnik, P. Olszewski-Kubilius, and F. C. Worrell. Reprinted with permission.

physical factors serve as major delimiters (Malina, 2010). Serious piano and violin lessons are common for aspiring musicians in the early childhood, whereas intensive study with wind instruments is delayed until the body has expanded lung capacity, typically in adolescence. On the descending side of the trajectory, athletes and dancers, no matter how great, will leave the arena or stage as performers when they are no longer able to compete physically or translate their esthetic vision in such a way that people will come to see their performance.

The trajectory of academic domains (what Tannenbaum, 1983, and Subotnik et al., 2011 call *producers* in contrast to *performers*) is more complicated because physical contributions to production are minor, and intellectual and social–emotional experience variables serve as important delimiting factors. A sticking point that remains is whether earlier introduction to additional academic domains would lead to more promising talent development trajectories. For example, social sciences are presented in a very limited way during secondary school with primary immersion starting in college. Perhaps our conceptions of domains are simply constrained by this tradition, or because of competing interests in the school curriculum, rather than on the capacity of children to comprehend basic concepts of these disciplines.

Although the talent development and high performance literature supports the view of trajectories that start, peak, and end at different ages, according to more traditional approaches to giftedness and gifted education, IQ can be predicted reliably by age 8. From that point onward, the level of an individual's giftedness does not change, and remains an essential component of an individual's being and way of viewing the world regardless of achievement in any specific areas (Pfeiffer, 2012).

Opportunities Need to Be Provided and Taken

Abilities need to be fostered at each stage of the trajectory in a domain, and this will happen with the provision of opportunities to work with mentors, teachers, and talented peers (see, e.g., Park, Lubinski, & Benbow, 2013; Wai, Lubinski, Benbow, & Steiger, 2010). These opportunities emerge from a supportive community that broadly includes schools, local and regional networks, and society at large. Some domains are more likely to thrive in some localities or regions than others. For example, most communities recognize the value of preparation and training in math and science, and will offer advanced classes, clubs, and fairs for these domains. Other domains (e.g., classical dance) may be central to the culture of one community (e.g., East Indian societies), but not to others.

A complicating factor in the distribution of exposure to opportunity is family influence. Various domains have traditions of family lineage, particularly in performance arenas, where values and aesthetics are inculcated at an early age. This family influence can be seen even in academic domains (see Chapter 30, this handbook). For example, 40% of the recipients of 2010–2012 U.S. Presidential Early Career awards in science and engineering—one of the nation's most prestigious forms of recognition for scientific creativity—had parents employed in science careers. Approximately 60% of students attending selective science high schools have at least one parent employed in a science career. These high percentages are also reflected in the families of talent search students who elect to take math and science courses through the Center for Talent Development or the Center for Talented Youth (Almarode et al., in press). For children and adolescents, following the path forged by a parent is far less complicated than taking a different direction, to say nothing of breaking out of class-based expectations. For this reason, talent development policies must not rely exclusively or even centrally on family investments.

There is a particular heartbreak of affording a child or adolescent an opportunity to participate in a special program only to have the offer met with indifference. This indifference may reflect a true lack of interest, despite potential abilities, or may mask fears or anxieties regarding increased expectations or competition. These differences are important to keep in mind to ensure that insecurities are not left unaddressed and intervention is provided, if needed. However, moving forward from competencies to expertise and beyond requires a commitment to make the development of talent a priority (Subotnik et al., 2011).

Sometimes, opportunities come in the form of chance factors. In fact, the public has been captivated by ideas of outstanding performance resulting only from chance factors (e.g., being the oldest in a cohort; Gladwell, 2008; see also Colvin, 2008; Syed, 2010). The talent development process clearly is not entirely scripted. However, incorporating chance into the framework of talent development (Gagné, 2013; Tannenbaum, 1983) promotes capitalizing on chance events by way of preparation and familiarity with insider knowledge. An example can be found in how the great conductor Leonard Bernstein's career trajectory soared as a result of two fortuitous events—Bernstein was an up-and-coming musician at a time when members of the New York Philharmonic were being recruited into the military during World War II (he suffered from asthma and was exempt from military service) and he was prepared to take up the baton when guest conductor, Bruno Walter, became unavailable for a major performance, and his work received rave reviews.

More conventionally, gifted programs, particularly in elementary grades, tend to be based on global giftedness measures rather than by domain of talent. Therefore, special schools or programs for the gifted that select students on the basis of global measures end up including children who never make a connection to their specific abilities and interests or who focus their energy on achievement in a particular domain.

Some public resistance to gifted education arises from the argument that if everyone had the opportunities afforded to gifted students, everyone could be gifted. Certainly, emphasizing the malleability of specific abilities allows for more students with potential gifts to blossom at the beginning of the talent development process. However, in more advanced stages of talent development, participants are expected to achieve at very high levels and exhibit high levels of commitment and motivation. Talent development programs need to weigh the costs of two potentially tragic outcomes: (a) identifying children and adolescents with interest and commitment who do not have the necessary constellation of abilities to succeed at a high level beyond the initial stages, and (b) encountering children and adolescents who are clearly able and motivated but who have missed important initial developmental stages of the process when it is far more difficult or impossible to catch up. This second condition is more likely to occur in performance domains than in academic ones.

These potentially tragic circumstances point to some important directions that the talent development field needs to pursue in its research agenda. More evidence needs to be accumulated to test the impact of various talent development opportunities, and at what dosages (Wai et al., 2010) these opportunities are most effective. Table 15.1 provides a set of variables that balance opportunity with motivation to show how such information might influence interventions designed to ensure that every young person with potential talent in valued domains receives appropriate services.

Psychosocial Variables Are Determining Factors

In addition to general and domain specific abilities recognized at the appropriate age for a given domain, and being given and taking opportunities, talented individuals benefit from enhancing their psychosocial skills and mental toughness, particularly during the later stages of talent development. This is true for several reasons. First, talented individuals will encounter greater competition as they progress in their field, and second, skills like strategic risk taking will play a much more central role in their work. Third, challenging the existing dogmas, aesthetics, or values of a domain can lead to attacks or other challenges that require psychosocial strength (Sternberg, 1997; Sternberg & Lubart, 1995).

Within every domain, talented individuals, even visual artists or mathematicians who are typically associated with eccentric personalities, increasingly rely on engaging patrons, supporters, students, and audiences for their work. For example, in the longitudinal studies of visual artists conducted by Getzels and Csikszentmihalyi (1976), professional artists who created interesting and intriguing work were more likely to get attention if they rented a loft and interacted with potential buyers and gallery owners. According to Getzels and Csikszentmihalyi, these social encounters could be stressful

TABLE 15.1

Potential Intervention Approaches for Talented Children and Adolescents on the Basis of Motivation and Opportunity

	High opportunity	Low opportunity
High motivation	Greatest likelihood of eminent outcome with appropriate educational dosage, psychosocial supports, and environmental supports. Best "bang for the buck."	Enhanced likelihood of eminent outcome with teaching resources and insider knowledge plus appropriate educational dosage, psychosocial supports, and environmental supports. Most important societal responsibility.
Low/undetermined motivation	Eminence not likely unless motivation is enhanced by programs that assist with changing mindsets and matching students to appropriate domains and mentors. Limited investment to generate motivation.	Outcome depends on provision of opportunities to reveal interests and abilities and enhance motivation. Greatest challenge to society; worthy of investment in opportunity. With opportunity, motivation may or may not develop.

Note. From "Rethinking Giftedness and Gifted Education: A Proposed Direction Forward Based on Psychological Science," by R. F. Subotnik, P. Olszewski-Kubilius, and F. C. Worrell, 2011, *Psychological Science in the Public Interest, 12,* p. 36. Copyright 2011 by R. F. Subotnik, P. Olszewski-Kubilius, and F. C. Worrell. Reprinted with permission.

and uncomfortable for visual artists who are often introverted and solitary in their aesthetic pursuits. However, this is what an artist must be able to do to financially support a life devoted to art. And according to Subotnik, Pillmeier, and Jarvin (2009), mathematicians, also stereotypically viewed as eccentric and reclusive, recognize that to maintain a coveted academic career, they need to attract outstanding students and communicate their ideas to others who may not understand work conducted in a very narrow spectrum of the field (see also Olszewski-Kubilius, Subotnik, & Worrell, 2015a, 2015b).

Table 15.2 demonstrates how psychosocial skills development can vary over time helping the transition from ability to competency, from competency to expertise, and beyond. Other psychosocial skills, like strategic risk taking, are central to the third stage as well. Consider the decision to pursue a counterintuitive approach to problem solving. Pursuing this course requires taking a risk, but it is

TABLE 15.2

Variables That Change Over Talent Development Trajectories

Ability to competency	Competency to expertise	Expertise to scholarly productivity/artistry or eminence
Exhibits natural self-confidence in abilities	Questions self-confidence in response to talented peers	Demonstrates self-confidence, even if it is not felt
Teacher focuses on attending to students' strengths and weaknesses	Takes increasing responsibility for attending to strengths and weaknesses	Capitalizes on strengths and shores up weaknesses
Exhibits openness to instruction ("teachability")	Willing to question instruction in light of own ideas	Focuses on applications and refinement of one's own ideas
Parents provide pressure and support	Parental pressure is counterproductive; parental emotional and financial support is very helpful	

Note. From *Conceptions of Giftedness* (p. 346), by R. J. Sternberg and J. E. Davidson (Eds.), 2005, New York, NY: Cambridge University Press. Copyright 2005 by Cambridge University Press. Reprinted with permission.

also a strategic one with a potentially high payoff. These sorts of judgments are best made with the advice of a mentor, but as one advances in a career, those bottom line decisions are most often made alone (see also Olszewski-Kubilius et al., 2015a, 2015b).

Critical psychosocial skills serve as handmaidens to the enhancement of talent development and offer protection from inhibiting factors. If there is a unique psychology of gifted individuals, it likely results from striving to be exceptional, with the concurrent ramification of being out of sync in a particular social or cultural context. Views of gifted individuals as being differentiated mainly by drive and commitment to creative pursuit (Dai & Westcott, 2012; Nicpon & Pfeiffer, 2011; Olenchak, 2009; Subotnik et al., 2011) run counter to arguments that gifted children can be defined by unique psychological characteristics or traits (e.g., overexcitabilities, vulnerabilities, intensities; Daniels & Piechowski, 2009; Peterson, 2015; Piechowski, 1999). Despite Tannenbaum's (2000) misgivings about the connection between high IQ and children's ethical behavior, many also continue to believe in the moral superiority or exceptional sensitivity of gifted children.

Gifted children vary as much as others regarding long lists of positive and negative characteristics that have been attributed to them (Neihart, Pfeiffer, & Cross, 2015). These characteristics result from interactions between gifted children and their home, community, and school environments, and may be in response to or independent of the label "gifted" (Freeman, 2010; Neihart, 1999; Worrell, 2010). Identifying negative characteristics associated with outstanding abilities may be left over from disproven connections to theories that indicate gifts come with compensatory deficits, whether social, emotional, or physical (Tannenbaum, 1983).

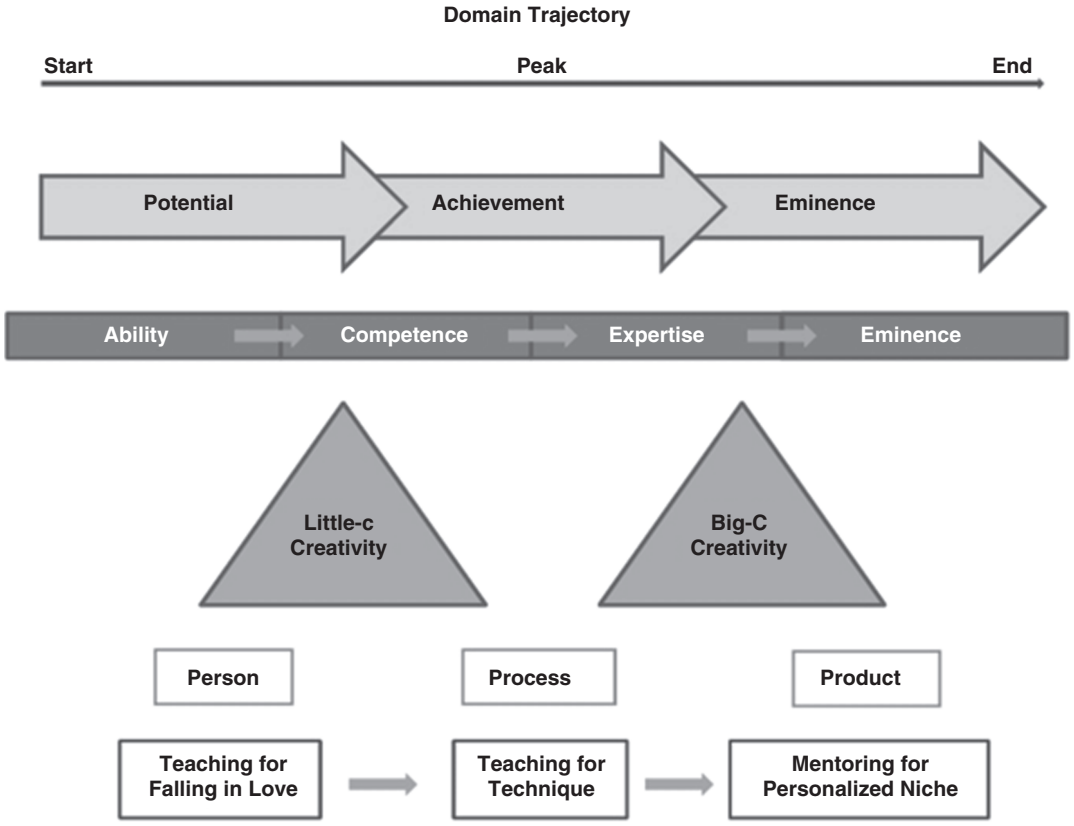
What is needed in the talent development literature is more definitive evidence of which psychological factors enhance and support, rather than depress, gifted functioning at different stages of a domain. We began that process in the presentation of the mega model (see Figure 15.2; see Olszewski-Kubilius et al., 2015a, 2015b, for more detail). Ideally, additional studies will be conducted to test the proposed model with additional domains beyond music and math.

Gifted Education Should Help Gifted Individuals Reach Their Goals of Eminence

If eminence is characterized as transcendent contributions to improving the human condition through solving problems or creating beauty, then helping children and adolescents channel their gifts in that direction is an appropriate aspiration for gifted education (Olszewski-Kubilius, Subotnik, & Worrell, 2016). Achieving eminence may take years of effort and frustration, and it requires high-level expertise and creativity, strategic use of psychosocial skills, and luck. And the trajectory of talent requires cooperation of several professionals with complementary expertise to make this all happen.

Eminence is not a path that every talented individual seeks for himself or herself, nor is there likely room to accommodate the number of people with talent who may wish to be eminent (Worrell, Olszewski-Kubilius, & Subotnik, 2012). Nevertheless, the field owes it to gifted children and society to conceptualize gifted education as part of a long-term system rather than focusing exclusively on moving children through one set of grades in a single school. A talent development system would work closely with out-of-school institutions to provide authentic experiences for purposes of (a) enrichment at the beginning of the trajectory, (b) socialization and intensive content exposure and skill training for the middle levels of the trajectory, and (c) opportunities for apprenticeships in creative exploration in the transition from expertise to creative productivity (see Chapter 18, this handbook).

A traditional view of giftedness and eminence is somewhat contradictory. On one hand, gifted children are described as our nation's future innovators and national resources. On the other hand, gifted children are described as special beings whether or not they contribute. This contradiction leads to viewing productivity as important, but also allows high-IQ adult to continue to call themselves gifted without any evidence of productivity or achievement. The conception that smartness is a trait



Delimiters to Talent Development:	Enhancers:
External and chance factors:	External and chance factors:
Late entry into domain	Opportunities offered
Poor match between interests and opportunities	Financial, social, and cultural capital
Psychosocial factors:	Psychosocial factors:
Low motivation	Opportunities taken
Unproductive mindsets	Productive mindsets
Low level of psychological strength	Developed psychological strength
Poor social skills	Developed social skills

FIGURE 15.2. The mega model of talent development. From "Rethinking Giftedness and Gifted Education: A Proposed Direction Forward Based on Psychological Science," by R. F. Subotnik, P. Olszewski-Kubilius, and F. C. Worrell, 2011, *Psychological Science in the Public Interest, 12,* p. 34. Copyright 2011 by R. F. Subotnik, P. Olszewski-Kubilius, and F. C. Worrell. Adapted with permission.

inherent to a person rather than resulting from ability applied to achieving goals has led to innumerable problems. As early as 1962, Tannenbaum reported on a large sample study of New York City high school students who reported great admiration for brilliance—if this brilliance was dissociated with effort and studiousness. This logic results in those without a high IQ believing they cannot be great, and those with a high IQ believing they can be great without having to work, or that they are not gifted if they have to work.

Teaching children what is likely to lead to eminent contributions goes a long way toward addressing distorted views of how people can use their gifts to meet personal goals. The academic domains are way behind the performance domains in developing

multiyear systems for developing talent that would provide children and adolescents with interests, motivation, and abilities access to needed knowledge, skills, and opportunities (Worrell et al., 2012). Europe is beginning an effort to provide a system of out-of-school networks that will facilitate any child who wishes to learn more about science, the humanities, or the arts finding a community of peers or mentors (see http://talentcenterbudapest.eu).

Our comprehensive synthesis of the literature around the five principles described in this chapter culminate in a working definition of giftedness. *Giftedness* is a developmental process that is domain specific and malleable. Although the path may begin with demonstrated potential, giftedness must be developed and sustained by way of training and interventions in domain-specific skills and programs and deliberate development of the psychological and social skills needed to pursue difficult new paths. The goal of this developmental process is to transform potential talent during youth into outstanding performance and innovation in adulthood.

PRACTICE AND POLICY ISSUES

Even a structure supported by a network of evidence can run into the realities of implementation. In the sections that follow, we address the most likely intersections between conception and policy.

Funding and Accountability

Gifted programs have a better chance to show the public and policy makers that they contribute (or add value) to the development of student talent if the outcomes are domain specific and include public demonstrations of student growth in performance as a result of participation. Gifted students are expected to at least meet and master state benchmarks for advanced level work, and this requires good record keeping and data collection.

Outcomes

The aspired short-term outcomes of a program would be to increase performance and maintain motivation and engagement in a domain. This goal would be reflected in enrollment in courses and experiences at the next level of talent development trajectories inside and outside of school (Bloom & Sosniak, 1981; Olszewski-Kubilius & Thomson, 2014, 2015). A commitment to high-level talent development requires greater openness on the part of schools to have students complete required, additional, or advanced studies through supplemental and outside-of-school programs (Pfeiffer, 2013). Schools would work collaboratively with universities and community organizations to create articulated pathways for students depending on their areas of interest and ability.

A comprehensive talent development program needs an outreach coordinator who can help to establish links between students and community, corporate, or university programs and resources, like those linked to the European Talent Support Network (http://www.talentcentrebudapest.eu). Other resources include summer and after school classes and mentorships such as the Talent Search Program or the Academic Talent Development Program, which are affiliated with individual universities in the United States, Ireland, and Spain (Corwith & Olszewski-Kubilius, 2012; Worrell, 2003). Finally, the coordinator for talent development could tailor the program to the special opportunities offered in the area where the school is located in terms of exposure and mentoring. For example, programs in the Denver area could focus on financial services, environment, communications, and engineering. In the New York area, mentors could easily be found in the arts, medicine, architecture, and advertising.

Identification and Programming

Regarding academic abilities, early identification can benefit from IQ testing, but early readers, children who appear to have a "mathematical cast of mind" (Krutetskii, 1976, p. 302), and children with early proficiency with languages also should be accommodated. In later grades, students would need to show domain specific achievement and performance at a level commensurate with their abilities, and policy requires a shift in focus to identifying students with domain abilities and providing them with the skills, knowledge, and values of the domain. In adolescence and early adulthood, talents can be displayed by way of creative work, and the kind of preparation

and mentoring relationships need to be in place to develop this level of ability.

Starting at the middle stage of talent development, some form of identification procedure or system that is content valid, related to, and predictive of performance in the domain needs to be used. For example, for a talent development program in the humanities, verbal skills would be most important and assessments might be used to ensure that academic skills in writing, comprehending, and synthesizing are sufficiently developed. Although it would be useful to have a good understanding of math, an otherwise talented and deeply interested student would not be screened out because of less than stellar quantitative scores. Additionally, instead of relying exclusively on standardized tests, candidates for a program in the humanities would be identified using samples of work that demonstrate a record of interest and involvement in a domain, including work conducted outside of school (e.g., in online writing communities).

Deep interests serve as excellent predictors of continued pursuit of challenging fields (Tai, Liu, Maltese, & Fan, 2006). However, relying on measures of interest can have two drawbacks. One is that a submitted piece of work may reflect the interests and input of the family in addition to, or instead of, the child. One time-consuming, but potentially rewarding, solution is to have face-to-face interviews or "auditions" of work. A more important and systemic difficulty with gauging interest is that interests are formed by experiences, and children who have not been exposed to enrichment in various domains may not have had a chance to develop their interests sufficiently to warrant consideration in such a program or to make their talent obvious. The solution to this problem is also expensive and challenging, and that is to provide a wide array of enrichment experiences available for free or for little cost to all children in the community as early as is developmentally appropriate.

Curriculum in a talent development program would be far more specialized than in a general academic gifted program. All requirements in terms of content and skills (e.g., prescribed curriculum standards) would be provided; however, most elective courses would be in the service of the domain. For example, in a specialized science school, there may be courses in technical writing or research methods that go beyond what is typically required and offered (Almarode et al., 2014). There would also be a wider array of courses in science, technology, engineering, and math, providing greater breadth of exposure to science fields as well as opportunities for increased depth of study. Other opportunities (e.g., internships, apprenticeships, mentorships, competitions, conferences, authentic research/work experiences) would be available to all who sought them out (see Chapter 23, this handbook).

Teacher Preparation

In addition to the regular teacher preparation, and the broad curriculum needed in a gifted education certificate or master's program, teachers wishing to work with elementary-age gifted students should be well versed in recent research on child development showing that previous concepts of cognitive development are not bound by age and stage (Bjorklund, 2012). In addition, teachers need to know about prodigiousness, and how to facilitate advanced achievement in children who show above-average facility in math, language, and reading. Teachers working with older gifted children should have at least amateur experience in a domain and have connections with other professionals and institutions outside of school in the community. Ideally, they would also be familiar with the concepts of mental skills or psychosocial skills that enhance talent development (Olszewski-Kubilius et al., 2015a, 2015b).

Psychological Support

Psychosocial skills coaching helps participants pursue challenges beyond their current knowledge, engage confidently in competitions, and take advantage of chance opportunities (Nicpon & Pfeiffer, 2011). The main psychosocial issues faced by talented children and adolescents include negative social and academic comparisons with peers, or unhelpful mindsets leading to maladaptive perfectionism, crises of confidence, and underachievement. The challenge for gifted children and the adults who work with them involves reversing negative self-talk, practicing intellectual

risk taking in safe settings that mimic adverse conditions, and acknowledging that everyone has doubts at some point when things are not going as expected. Talented individuals, who are not only highly skilled and knowledgeable, but also personable, reliable, and creative, are more likely to gain access to wider networks of patrons and mentors, and hence valuable insider knowledge. Psychosocial skill instruction can be offered by trained teachers, coaches, and mentors who provide support to students within various domain-related, challenging academic activities.

Equity and Diversity

A talent development approach has the potential to diversify the population identified as gifted by focusing on specific domains rather than global giftedness. Two factors, however, can impede this outcome: First, domains that are supported need to be valued by a wide swath of the community; underrepresented communities must prize these domains and aspire to having their children succeed and shine in them. Second, opportunity for extensive exposure to domains needs to be widespread and of high quality. Engagement by the entire school community, change in identification procedures, and provision of opportunities for enrichment require policy and budgetary commitments (Lee, Olszewski-Kubilius, & Peternel, 2009; Olszewski-Kubilius, 2006; VanTassel-Baska, Olszewski-Kubilius, & Kulieke, 1994; Worrell, 2003, 2007, 2014; Worrell, Szarko, & Gabelko, 2001). Further, psychosocial skills coaching and out of school activities will need to be provided to ensure success (Worrell et al., 2012). Addressing the psychological factors that impede performance and participation are integral to the talent development model. Finally, providing information on explicit pathways to adult success in domains is essential, as this insider knowledge is currently in the purview of highly educated and involved parents.

As first described by Tannenbaum in 1983, there are many inhibitors to talent fulfillment, from society and the community, and from the reluctance of individuals who are targeted for services. The five main principles of talent development derived from the creative productivity and high performance literature provide a direction for gifted education that can result in the flourishing of a wide range of potential ability.

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