CHAPTER 25

Blending Promise with Passion: Best Practices for Counseling Intellectually Talented Youth

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> Despite the American myth, I cannot be or do whatever I desire—a truism, to be sure, but a truism we often defy. . . . Like organisms in an ecosystem, there are some roles and relationships in which we thrive, and others in which we wither and die. (Palmer, 2000, *Let Your Life Speak: Listening for the Voice of Vocation*, p. 44)

We open with this quote from educator and writer Parker Palmer as a way of capturing parts of both the challenge and essence of career counseling with intellectually talented individuals. One of the challenges is highlighted by the message that we can "be or do whatever we desire," which is pervasive in Western society and can become particularly poignant for the intellectually talented, as they attempt to journey toward finding success and satisfaction in work and life. An important part of the essence of career counseling with this special population is captured by the latter part of the quote. That is, we believe there exist particular applications of each individual's unique set of talents, interests, and ambitions—that is, their intellectual promise and personal passion—which will allow them to differentially thrive in some niches relative to others. Even those with abundantly diverse gifts will find they are better suited for, and more fulfilled by, certain environments than others.

Isolating the subset of environments that individuals are best suited for is an important first step that career counselors and psychologists are uniquely positioned to facilitate. Just as problem definition is an important first step in issue resolution, identifying personal assets and relative liabilities is a critical first step

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in talent development. We believe it is our obligation as counselors to use the best that modern science has to offer to assist intellectually talented students in finding environments in which they are most likely to thrive. Doing so requires that we begin by focusing at early ages on determinants that enhance positive development (Achter & Lubinski, 2003), a process counseling psychologist and gifted student advocate Sidney Pressey (1955) referred to as "furtherance."

Contributing to this volume is a privilege, and with this opportunity we hope to impart to readers—whether budding career counselors or seasoned veterans wishing to expand or update their knowledge about intellectually talented students—the essential ideas and tools for providing effective career counseling to intellectually talented populations. Our aim is to present findings (especially longitudinal findings) in a fashion that logically flows into practice. Some of the perceived roadblocks to successful counseling with this special population are addressed, in particular, multipotentiality; and we summarize research that reframes issues surrounding multipotentiality and draws links to counseling contexts. The broad framework guiding our approach is familiar to those versed in person-environment approaches to vocational psychology. We begin with some background, drawn from pioneers in gifted education and leaders of the individual differences approach to counseling psychology (e.g., Dawis, 1992; Tyler, 1974, 1992; Williamson, 1965).

FOCUSING ON YOUTH

Readers might ask why our focus is on youth or, more specifically, adolescents. A brief perusal of work over the past 100 years provides the answer. Modern approaches to identifying and working with intellectually talented students began in the early 1900s, with notable educators and scientists such as Leta Hollingworth (1926, 1942) and Lewis Terman (1954; Terman & Oden, 1947). Both of these pioneers recognized that those with high general intelligence (which was how the gifted were exclusively identified in those days) needed special attention if they were to develop their gifts and avoid becoming bored or underachieving. In addition, they, along with other eminent psychologists throughout the twentieth century (e.g., Paterson, 1957; Pressey, 1946, 1955, 1967; Seashore, 1922; Stanley, 1974, 1996; Tyler, 1974, 1992; Williamson, 1965), believed that the early detection of intellectual giftedness was the first step in facilitating truly exceptional talent development.

Within gifted populations, by definition, intellectual abilities exist at extraordinary levels. The emergence of superior intellectual abilities in children and adolescents, as measured by various standardized tests, is best conceptualized in terms of precocity (Benbow, 1991; Jackson & Butterfield, 1986; Sternberg & Davidson, 1985). The precocity explanation asserts not that intellectually talented children differ qualitatively in terms of reasoning or cognitive functioning, but rather that they are ahead of their time—that is, functioning at an intellectual level indicative of persons a few to several years older (Benbow, 1991; Dark & Benbow, 1993). In this view, preadolescent children who perform highly on tests such as the Scholastic Aptitude Test (SAT) are believed to be reasoning at a level characteristic of students three to five years older. This was the guiding principle driving the inception of the Study of Mathematically Precocious Youth (SMPY; Stanley, 1974, 1996; Stanley & Benbow, 1986), a longitudinal study of more than 6,000 intellectually gifted individuals, now in its fourth decade, which has expanded identification of the gifted beyond general intelligence to specific abilities. Much of the data presented in this chapter has been drawn from this ongoing study.

In addition to their precocious intellectual development, it has also been observed that the intellectually talented tend to begin at an earlier age to think about their career possibilities (Milne, 1979; Willings, 1986). If a seventh grader is capable of reasoning mathematically or verbally at or above the twelfth-grade level, the thinking goes, maybe he or she is also thinking ahead to college majors in architecture, math/science, or philosophy, for example, or perhaps even to a career in one of these fields. Much evidence exists to suggest that advanced thinking about educational possibilities and careers is present in many gifted youth, as an outgrowth of their advanced cognitive development (Shoffner & Newsome, 2001; Silverman, 1993). In fact, Willings (1986) suggested that most gifted students begin thinking seriously about their work futures by the age of 9. Typically, however, structured career search programs in schools are not implemented until the senior high years, when they may be developmentally mistimed for gifted students (Kerr, 1981; Willings, 1986).

As we hope to make clear from available empirical evidence, early adolescence is a time when it is both possible and reasonable to begin applying tools intended for older students (e.g., college entrance exams and interest inventories) to help the intellectually talented: (1) come to a better personal understanding of their unique talents and interests, (2) consider the relevance of these attributes for education and the world of work, and (3) begin to think about how nurturing these characteristics could contribute toward their future development. Against this historical and conceptual backdrop, we now move to addressing effective foundations for educational and vocational counseling with the intellectually talented. For the reasons just outlined, our approach to working with these students begins with the assumption that traditional theories and tools of vocational psychology are well suited to this task.

APPLICATIONS OF PERSON-ENVIRONMENT FIT THEORIES: A MODEL FOR BLENDING PROMISE WITH PASSION

Fredrick Beuchner (1993) defined *vocation* as "the place where your deep gladness meets the world's deep need" (p. 119). This language, from outside the realm of vocational psychology, eloquently captures the essence of the person-environment (P-E) fit approach to the vocational decision-making process. That is, a person's "deep gladness" reflects an internal state that is likely to be achieved when the combination of his or her unique abilities, interests, and values (both intellectual "promise" and personal "passion") match the "world's deep need."

For more than a decade, the Study of Mathematically Precocious Youth (SMPY) has used the Theory of Work Adjustment (TWA; Dawis & Lofquist, 1984; Lofquist & Dawis, 1991; see also Dawis, Chapter 1, this volume), a modern-day P-E fit theory, as the overarching framework for understanding and studying talent development over the life span (Lubinski & Benbow, 2000). Within this theory, the critical areas of abilities and preferences are given greater specificity through the application of two empirically validated organizational systems:

1. Snow's (Snow, Kyllonen, & Marshalek, 1984; Snow & Lohman, 1989) radex scaling application for organizing the hierarchical structure of cognitive

abilities (a general factor supported by three major group factors—verbal-linguistic, mathematical-numerical, and spatial-mechanical).

2. Holland's (1985, 1996) hexagon structure for six general educational-vocational interest themes (i.e., Realistic, Investigative, Artistic, Social, Enterprising, and Conventional).

Figure 25.1 depicts an integration of the radex and RIASEC models with TWA, a broader theoretical framework for conceptualizing educational-vocational adjustment as well as talent development (Lubinski & Benbow, 2000). For more specific details on cognitive abilities, see Carroll (1993), Jensen (1998), Lubinski (2004), and Ryan Krane and Tirre (Chapter 14, this volume); and, for interest dimensions, see Holland (1985, 1996), Prediger (1982), and Spokane and Cruza-Guet (Chapter 2, this volume). For a more complete theoretical treatment for how these models, organized around TWA, have been extended to intellectually gifted youth, see Lubinski and Benbow (2000). Additional extensions to applied practice in gifted education are found in Benbow and Lubinski (1997) and Lubinski and Benbow (1995).

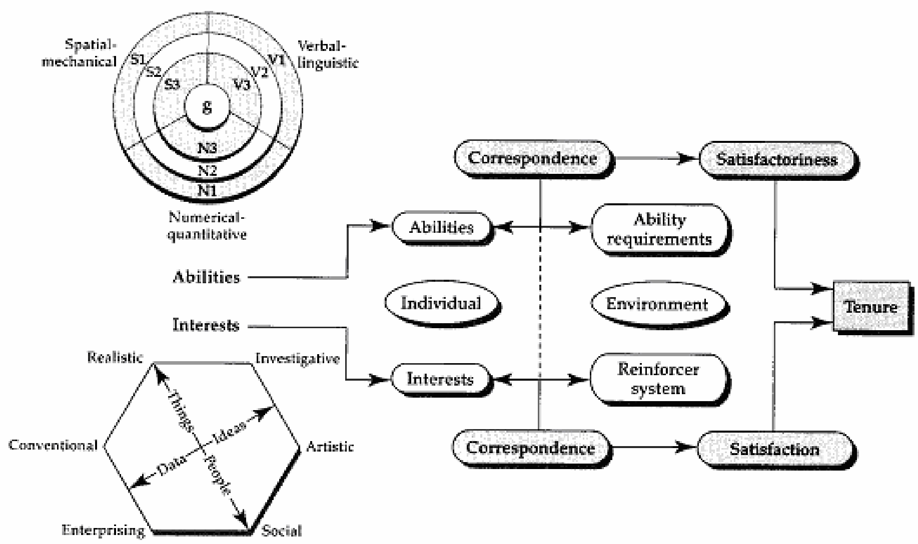

Figure 25.1 The Theory of Work Adjustment (Right) Combined with the Radex Scaling of Cognitive Abilities (Upper Left) and the RIASEC Hexagon of Interests (Lower Left) for Conceptualizing Personal Attributes Relevant to Learning and Work (Lubinski & Benbow, 2000). [*Note:* The letters in the cognitive ability arrangement denote different regions of concentration, whereas their accompanying numbers increase as a function of complexity. Contained within the RIASEC is a simplification of this hexagon. Following Prediger (1982), it amounts to a two-dimensional structure of independent dimensions: people/things and data/ideas, which underlie RIASEC. The dotted line running down the individual and environment sectors of TWA illustrates that TWA places equal emphasis on assessing the personal attributes (abilities and interests) and assessing the environment (abilities requirements and reward structure).]

According to TWA, optimal learning and work environments are defined by the co-occurrence of two broad dimensions of correspondence: (1) *satisfactoriness* (a match between ability and ability requirements) and (2) *satisfaction* (a match between preferences such as interests and values and the rewards typical of contrasting learning and work environments). The Theory of Work Adjustment places equal emphasis on matching these two and, subsequently, aligning these broad dimensions of correspondence with the unique ambitions and energies of individual clients, students, and workers.

It is important to highlight the dual emphasis on abilities and preferences when working with the intellectually talented. They are not a categorical type, and cognitive ability and preference assessments are helpful in uncovering the magnitude of their individuality. Whereas the field of vocational counseling more generally has shifted its focus away from ability assessment in recent decades (Gottfredson, 2003), accurate measurement of abilities remains a critical component that cannot be neglected when working with any population; indeed, doing so was referred to as a "truncated" view of vocational psychology by Williamson (1965). Parsons (1909), Paterson (1957), and Tyler (1974) said much the same (cf. Lubinski, 1996, 2001). Strong's (1943) concern that much "time and money are often wasted trying to prepare youths for careers which they or their parents desire today but not tomorrow, and for which too often the young people have no ability" (p. vii) is useful to keep in mind.

Following these ideas, Gottfredson (2003) published a modern treatment of this point of view, which makes a compelling case that cognitive abilities are at least as important as interests for vocational counseling. This point needs to be stressed because many theoretical frameworks of vocational development do not incorporate cognitive abilities (cf. Gottfredson, 2003) and, because of this, are misspecified or underdetermined models (Lubinski, 2000; Lubinski & Humphreys, 1997). F. L. Schmidt and Hunter's (1998) meta-analysis of 85 years of personnel research makes this omission scientifically indefensible, as it empirically documents the critical influence of abilities in several work-related performance outcomes (for further details, see Drazgow, 2002; Gottfredson, 1997; Humphreys, Lubinski, & Yao, 1993; Hunt, 1995; Lubinski, 2004; Shea, Lubinski, & Benbow, 2001; Viswesvaran & Ones, 2002; Webb, Lubinski, & Benbow, 2002; Wilk, Desmarais, & Sackett, 1995; Wilk & Sackett, 1996).

ABOVE-LEVEL ABILITY ASSESSMENTS

Beginning with Julian Stanley and his SMPY research and service program initiated at Johns Hopkins University (and now located at Vanderbilt University), the use of above-level testing (i.e., using tests developed for older students) for identifying and nurturing intellectual precocity among gifted adolescents (Keating & Stanley, 1972; Stanley, 1977) has gained widespread use and acceptance. Stanley and his colleagues were the first to systematically use college entrance exams—the SAT and, later, the ACT (Benbow, 1991), tests typically taken by college-bound high school juniors and seniors—to differentiate levels of ability in both math and verbal domains for gifted adolescents (ages 12 to 14) who scored in the top 1% to 3% on grade-level achievement tests. By raising the ceiling of test difficulty, above-level ability testing has the benefit of spreading out high-ability students and distinguishing the able from the exceptionally able. Over the past 30 years, literally millions of seventh and eighth graders have taken these college entrance exams through annual talent searches throughout the United States (Benbow & Stanley, 1996). Currently, around 200,000 young adolescents do so annually.

The assessment of gifted youth at ages 12 or 13 using above-level tests such as SAT-Math and SAT-Verbal produces an ability profile that is beneficially diagnostic (Benbow & Lubinski, 1996; Benbow & Stanley, 1996; Stanley, 2000). For example, researchers at SMPY have observed that many intellectually talented individuals exhibit differential (rather than uniform—as was once assumed) strengths in either mathematical or verbal reasoning in adolescence (Achter, Lubinski, & Benbow, 1996). Over time, these differential areas of strength forecast the selection of contrasting educational and career paths (Achter, Lubinski, Benbow, & Eftekhari-Sanjani, 1999; Lubinski & Benbow, 2000; Lubinski, Benbow, Shea, Eftekhari-Sanjani, & Halvorson, 2001; Lubinski, Webb, Morelock, & Benbow, 2001). This information can meaningfully influence practice. Equipped with this specific ability information, educators, counselors, parents, and students can work together to differentially plan educational programs that are developmentally appropriate for bright youth (as we detail later in the section on interventions).

As is true for all adolescents (Humphreys et al., 1993), both ability *level* and ability *pattern* harbor practical importance in the lives of the intellectually talented (Achter et al., 1996, 1999; Shea et al., 2001; Webb et al., 2002). Consider first the importance of ability level. The range of individual differences in human abilities is huge, and the magnitude of these differences is sometimes underappreciated. Consider, for example, general intelligence. In terms of IQ points, scores within the top 1% on general intellectual ability range from approximately 137 to well over 200, a tremendous amount of quantitative variation among an already highly select group. The same is true for specific abilities, which in part is why persons considered gifted do not represent a categorical type. But the question often asked is whether these ability differences make a difference over the course of a person's life. Recent longitudinal reports unequivocally reveal that they do.

Building on a study of quantitative differences in educational and career outcomes between gifted individuals in the top versus the bottom quartiles of the top 1% in mathematical ability (Benbow, 1992), Lubinski, Webb, et al. (2001) studied a sample of 320 profoundly gifted individuals, identified for their exceptional (i.e., top 1 in 10,000) mathematical or verbal reasoning ability at age 13 (mean estimated IQ > 180). By age 23, 93% of this group had obtained bachelor's degrees, 31% had earned master's degrees, and 12% had completed doctoral degrees. Furthermore, fully 56% of this select group expressed intentions to pursue doctorates, a number more than 50 times the base rate expectation (i.e., 1% in the general population, U.S. Department of Education, 1997). By comparison, studies of persons in the highly able, but less select, top 1% (i.e., top 1 in 100) of cognitive ability have revealed pursuit of doctoral degrees at 25 times base rate expectations (Benbow, Lubinski, Shea, & Eftekhari-Sanjani, 2000)—which is truly remarkable, yet *only* half the rate observed among the top 1 in 10,000.

As impressive as this difference is, there is more to the story on the magnitude of achievement in the profoundly talented group. For example, among those pursuing doctorates in the top 1 in 10,000 study (Lubinski, Webb, et al., 2001), 42% were doing so at universities ranked within the top 10 in the United States, another indication of the extraordinary promise of this group. By comparison, only 21% of the top 1 in 100 (Benbow et al., 2000) were pursuing doctorates at universities ranked in the top 10, again half the rate of the higher ability group. It certainly appears that increased ability level translates into increased achievement among those at different segments of the top 1% (or the top one-third of the ability range), just as they do in the general population (Lubinski, 2004; Murray, 1998).

It is important to note that ability *pattern* also proved psychologically significant among these profoundly gifted individuals, by foreshadowing qualitatively distinct types of achievements. To demonstrate this, Lubinski, Webb, et al. (2001) categorized favorite courses (high school and college) and the age 23 accomplishments attained by the top 1 in 10,000 group, into Sciences & Technology, Humanities & Arts, and Other clusters. They then assessed whether these three clusters contained different proportions of members from the three distinct ability groups in their sample:

1. Those who had one standard deviation more mathematical, relative to verbal, ability (High-Math).
2. Those who had one standard deviation more verbal, relative to mathematical, ability (High-Verbal).
3. Those whose math and verbal abilities were more uniform and within one standard deviation of each other (High-Flat).

As for favorite courses, the High-Math group consistently preferred math/science courses relative to the humanities, whereas the inverse was true for the High-Verbal group; the High-Flat group showed more balanced course preferences overall (see Figure 25.2). The differential course preferences among these three groups in high school and college also coincided with qualitative differences in age 23 accomplishments (see Table 25.1). Of those listing achievements in science and technology, three-fourths were in the High-Math group. By comparison, two-thirds of those listing accomplishments in the humanities and arts were in the High-Verbal group. High-Flat participants reported similar numbers of accomplishments in both the sciences and humanities clusters. It is evident that ability patterns emerging in early adolescence among the intellectually talented relate to the types of activities to which these individuals devoted time and effort.

Other investigations on the longitudinal significance of ability pattern have generated even more refined predictions by adding the assessment of spatial abilities to the equation. For example, Shea et al. (2001) tracked a group of 563 intellectually precocious participants (393 boys, 170 girls) at three time points over a 20-year interval. At age 13, participants were in the top 1% of their age mates in general intellectual ability; at this time, they were assessed on quantitative, spatial, and verbal reasoning measures. At ages 18, 23, and 33, individual differences in their mathematical, spatial, and verbal abilities assessed in early adolescence were related in distinct ways to preferences for contrasting disciplines and ultimate educational and occupational group membership.

The four developmentally sequenced panels of Figure 25.3 visually depict these patterns. Specifically, panels A and B, respectively, show whether participants' favorite and least favorite high school courses were in math/science or the humanities/social sciences. Panels C and D, respectively, reflect college major at age 23 and occupation at age 33. All four panels represent a three-dimensional view of how mathematical (X), verbal (Y), and spatial (Z) ability factor into educational-vocational preferences and choice. For all four panels, all three abilities are standardized in z-score units (A and B are within sex; C and D are combined across sex). For each labeled group within each panel, the direction of the

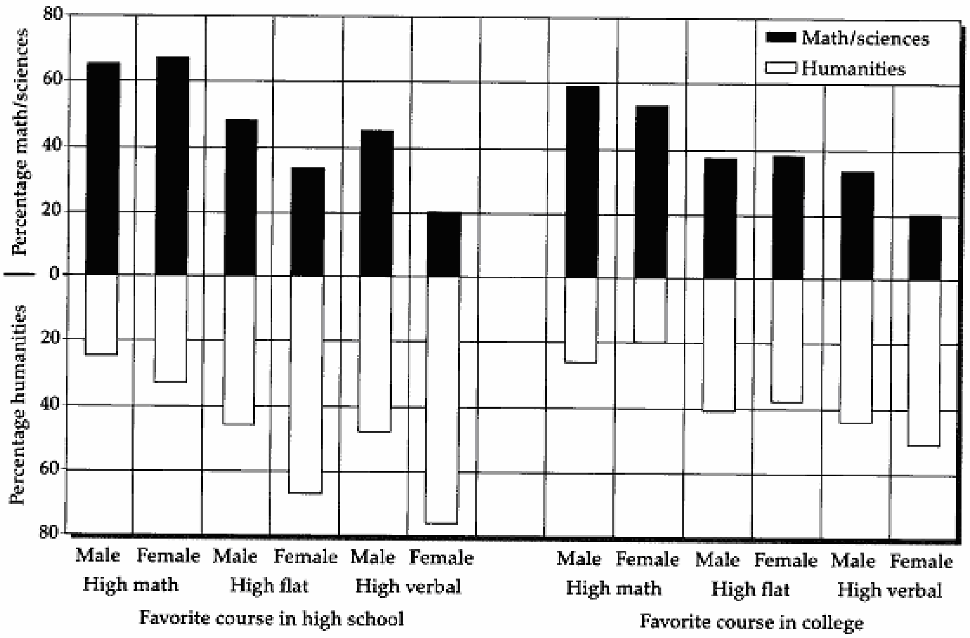

Figure 25.2 Participants' Favorite Course in High School and in College (Lubinski, Webb, et al., 2001). [*Note:* Percentages in a given column do not necessarily sum to 100% because only participants indicating either math/sciences or humanities courses are displayed. Significance tests for differences among groups for favorite course are as follows: high school math/science χ^2 (2, $N = 320$) = 20.7, $p < .0001$; college math/science χ^2 (2, $N = 320$) = 18.2, $p < .0001$; high school humanities χ^2 (2, $N = 320$) = 36.6, $p < .0001$; and college humanities χ^2> (2, $N = 320$) = 30.2, $p < .0001$.]

arrows represents whether spatial ability (Z-axis) was above (right) or below (left) the grand mean for spatial ability. These arrows were scaled in the same units of measurement as the SAT (math and verbal) scores, so you can envision how far apart these groups are in three-dimensional space in standard deviation units as a function of these three abilities.

In summary, these findings suggested that higher levels of math, relative to verbal abilities, characterized group membership in engineering and math/computer science areas. The engineering and math/computer science groups also demonstrated higher levels of spatial abilities. The natural and physical sciences stood alone in being characterized by higher levels of all three abilities: math, spatial, and verbal. More balanced verbal and math profiles and generally lower levels of spatial abilities characterized fields such as medicine, law, and business. These findings were highly consistent for other outcome criteria as well, such as graduate field of study (Shea et al., 2001). In addition, it is important to note that across all time points, all three abilities achieved a statistically significant degree of *incremental validity* (Sechrest, 1963) relative to the other two in predicting group membership in the educational-vocational groups.

Table 25.1
Awards and Special Accomplishments of the Top 1 in 10,000 in Mathematical or Verbal Reasoning Ability

Sciences and Technology	Humanities and Arts	Other
Scientific publications (11)	Creative writing (7)	Phi Beta Kappa (71)
Software development (8)	Creation of art or music (6)	Tau Beta Pi (30)
Inventions (4)	Fulbright award (2)	Phi Kappa Phi (14)
National Science Foundation fellowship (2)	Wrote proposal for a novel voting system for new South African Constitution	Entrepreneurial enterprises (2)
Designed image correlation system for navigation for Mars Landing Program	Solo violin debut (age 13) Cincinnati Symphony Orchestra	Omicron Delta Kappa
The American Physical Society's Apker Award	Mellon Fellow in the Humanities	Olympiad Silver Medal
Graduated from Massachusetts Institute of Technology in three years at age 19 (entered at 16) with perfect (5.0) grade point average and graduated from Harvard Medical School with MD at age 23	Presidential Scholar for Creative Writing	Finished bachelor's and master's in four years
Teaching award for "Order of Magnitude Physics"	Hopwood writing award	Received private pilot's license in one month
	Creative Anachronisms Award of Arms	
	First place in midreal-medieval poetry	
	Foreign language study fellowship	
	International predissertation award	

Group	Sciences and Technology	Humanities and Arts
High-Math	16	5
High-Flat	6	6
High-Verbal	7	13

Note: Numbers in parentheses represent the number of participants indicating each accomplishment. All other entries represent a single individual.

Source: From "Top 1 in 10,000: A 10-Year Follow-Up of the Profoundly Gifted," by D. Lubinski, R. M. Webb, M. J. Morelock, and C. P. Benbow, 2001, *Journal of Applied Psychology,* 86, pp. 718–729.

ABOVE-LEVEL ASSESSMENT OF PREFERENCES

While the systematic application of above-level assessment of specific abilities now enjoys more than a 30-year history of documented applied utility, what was not known until more recently was the extent to which preference dimensions could be assessed in a reliable and valid manner at early ages to address the satisfaction dimension of TWA with intellectually talented youth. Is it possible, for instance, to think about the presence of precocity among the intellectually talented in the vocational preference domain, conceptualized as early crystallization of interests and values? If so, perhaps such assessments might offer clues about what these bright young students are likely to be passionate about later in

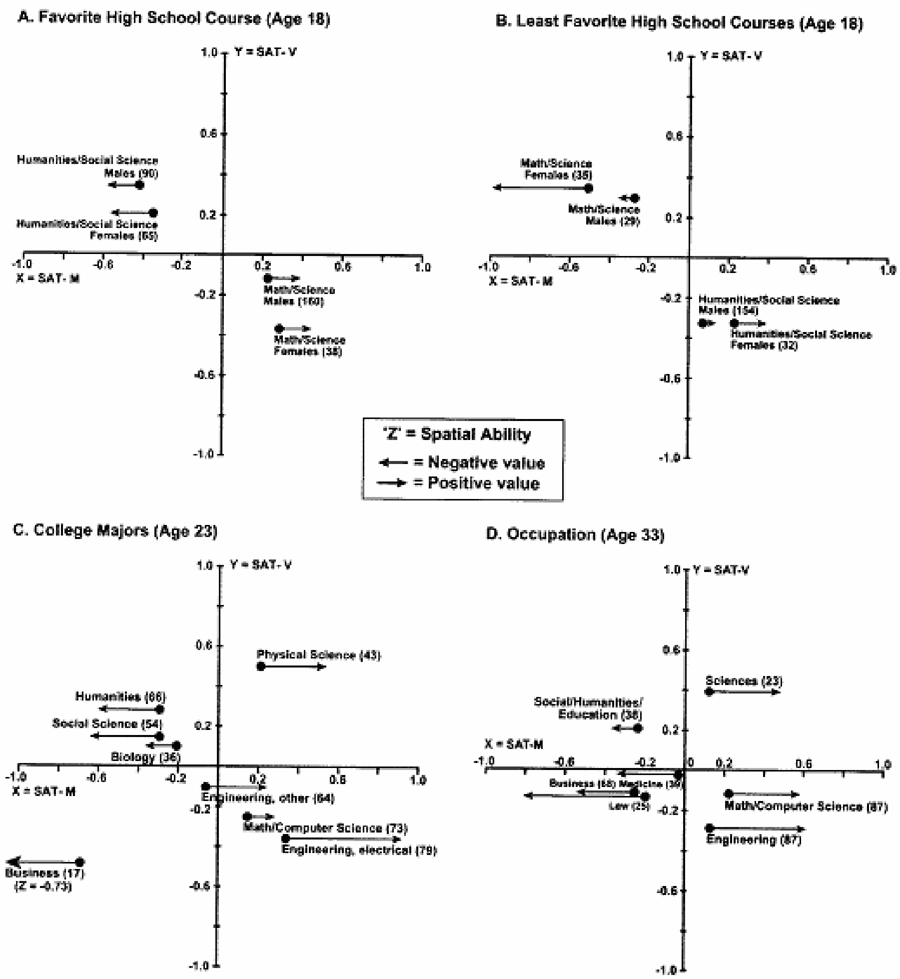

Figure 25.3 Trivariate Means for (A) Favorite High School Class and (B) Least Favorite Class at Age 18, (C) Conferred Bachelor's Degree at Age 23, and (D) Occupation at Age 33. [*Note:* Group *ns* are in parenthesis. SAT-V = Verbal subtest of the Scholastic Assessment Test; SAT-M = Mathematical subtest of the Scholastic Assessment Test; and Spatial Ability = A composite of two subtests of the Differential Aptitude Test (space relations + mechanical reasoning). Panels A and B are standardized within sexes, panels C and D between sexes. The large arrowhead in panel C indicates that this group's relative weakness in spatial ability is actually twice as great as that indicated by the displayed length. *Source:* Adapted from Shea et al. (2001).]

life. Roe (1956) asserted that, on average, interests tend to crystallize by approximately age 18 in the general population. This general finding guided the development of vocational preference instruments, which typically target persons from high school age and above. Among the intellectually gifted, however, crystallization may occur at an earlier age and could be combined with ability assessment to aid advanced educational and early career planning.

Several pieces of evidence support this line of thinking. As noted previously, many career educators and teachers of the gifted have asserted that interests, values, and other preferences appear to crystallize earlier in this special population (Milne, 1979). In earlier empirical studies, Flanagan and Cooley (1966) found that gifted students tended to have more developed interests and a better understanding of their personal values and attitudes than students not identified as gifted. Terman (1954) noted that childhood interests of gifted individuals discriminated several years later between scientists and nonscientists and that the Strong Vocational Interest Blank (now Strong Interest Inventory) could usefully differentiate between interests in intellectually gifted samples.

More recent studies from SMPY have provided further validation to the early application of conventional preference questionnaires initially designed for adults. First, in a study among intellectually precocious young adolescents, Achter et al. (1996) showed that both the Strong Interest Inventory and the Study of Values revealed marked individual differences in this population; that is, between 72% and 77% of gifted adolescents had interest and value profiles that showed clear differentiation between themes.

A second pair of studies highlighted the temporal stability of preferences assessed at an early age in this population. The first, by Lubinski, Benbow, and Ryan (1995), provided support for the general stability of vocational interest patterns in 162 gifted individuals over a 15-year period from adolescence to adulthood (age 13 to age 28). Specifically, the dominant theme for any individual at age 13 was significantly more likely than chance to be either dominant or adjacent to the dominant theme at age 28 (following the hexagonal organization of RIASEC; Holland, 1985). In a constructive replication (Lykken, 1968) of the aforementioned study, Lubinski, Schmidt, and Benbow (1996) assessed the temporal stability of the Study of Values (SOV; Allport, Vernon, & Lindzey, 1970) among an independent sample of 202 intellectually gifted participants over a 20-year period from age 13 to age 33. Consistent with results of the first study, the dominant SOV theme at age 13 was significantly more likely than chance to be dominant or adjacent to the dominant theme at age 33 (see Lubinski et al., 1996, for definition of adjacency). In addition, a comprehensive evaluation of the construct validity of the Strong and SOV for intellectually precocious 12- to 14-year-olds (D. B. Schmidt, Lubinski, & Benbow, 1998) found that using these instruments on this special population generated psychometric properties parallel to those of young adults.

To solidify the generalization that vocational preferences tend to crystallize early among the intellectually talented, Achter et al. (1999) set out to examine whether preferences identified in adolescence were predictive of temporally remote educational outcomes and, importantly, to ascertain whether preference assessments added to predictions that already had been established by abilities as assessed by the SAT. To do so, the researchers followed a group of 432 intellectually precocious young adolescents over 10 years, from the time they took the SAT and Study of Values (SOV) at age 13, until approximately age 23, when they had secured college degrees. Results showed that age 13 assessments on preference dimensions added incremental validity to age 13 assessments of mathematical and verbal abilities in predicting broad categories of college majors (i.e., Math-Science, Humanities, and Other; the same broad categories used by the ability studies reviewed earlier). Specifically, of the 23% of total variance accounted for by the SAT and SOV across all three groups of college majors (which is excellent given the heterogeneity within each of these groups), the SOV accounted for an additional 13% of the variance between groups over and above the SAT scales, which accounted for 10%.

Discriminant analysis in the Achter et al. (1999) study revealed that high math ability and theoretical values, combined with lower social and religious values, were most predictive of completing math-science majors. High verbal ability and aesthetic values were most predictive of completing majors in the humanities. Majors categorized as "Other" (e.g., social sciences, business) were predicted by high social and religious values and low mathematical abilities and aesthetic values. Figure 25.4 summarizes results obtained from the discriminant analysis in this study. Overall, this collection of findings supports the notion that educationally and vocationally relevant preferences tend to crystallize early among the intellectually talented and that their applied use for this special population is warranted.

A final note to make about early emerging abilities and preferences is that they reveal how commensurate occupational success and satisfaction later in life are achieved in different ways—as TWA would forecast and as established with ability and preference measures in older populations (Dawis & Lofquist, 1984;

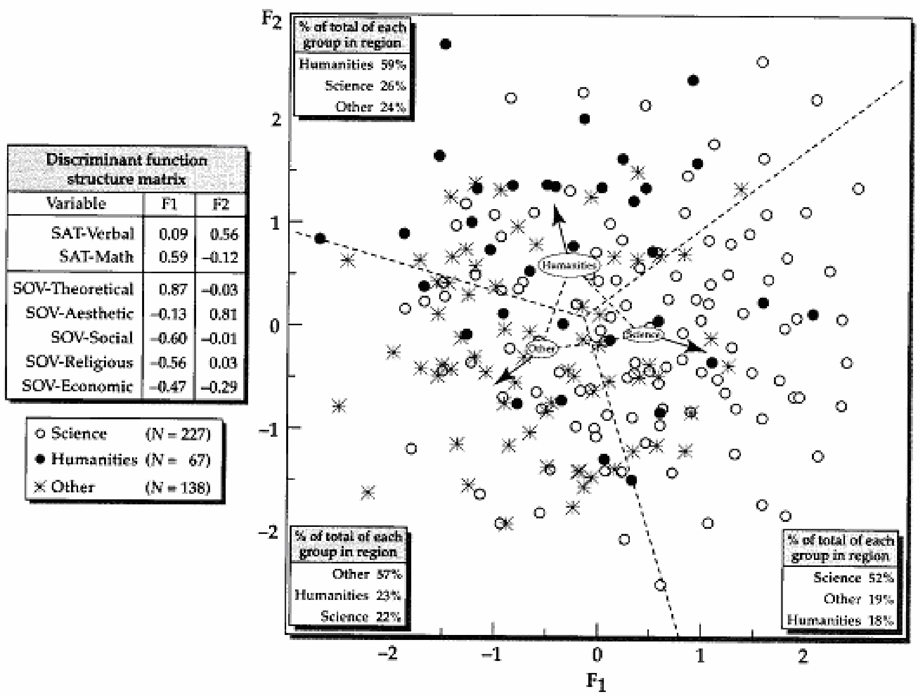

Figure 25.4 Group Centroids and a Discriminant-Structure Matrix (Achter et al., 1999). [*Note:* The bivariate group centroids for the total sample were (Function 1, followed by Function 2): math-science (.43, −.05); humanities (−.29, .60); and other (−.57, −.21). To make the scatter plot less cluttered, each bivariate point represents an average of two participants' discriminant scores (most typically, the closest geometrically). Percentages were computed using all individual data points. SOV = Study of Values; SAT = Scholastic Aptitude Test; F1 = Function 1; F2 = Function 2.]

Lofquist & Dawis, 1991). For instance, Benbow et al. (2000) reported that mathematically gifted 33-year-olds, first identified as gifted 20 years prior at age 13, overwhelmingly described themselves as both successful and satisfied with the direction of their careers. Across two different cohorts (total $N = 1{,}975$), roughly two-thirds of these individuals described themselves as "successful" or "very successful" and "satisfied" or "very satisfied" with their careers. These data on success and satisfaction showed no statistically significant sex differences, despite the fact that the males and females were differentially represented in various occupations (e.g., greater proportions of male math/computer scientists and engineers; greater proportions of female medical doctors, health care workers, and homemakers). This is likely due to the differential male-female ability/preference profiles among the intellectually talented (Lubinski & Benbow, 1992; Webb et al., 2002), which we address further in a subsequent section on gender differences and similarities.

After reviewing these modern findings, it should seem fairly clear that comprehensive ability and preference assessment among the intellectually talented, at an early age, is useful in predicting educational/vocational choice, level of success/achievement, and satisfaction. The contemporary research supports and extends the work of pioneers dating to Terman, Hollingworth, and many individual differences psychologists throughout the past century, highlighting the utility of early identification, attention to both general and specific abilities, and the importance of nonintellective factors such as preferences (i.e., interests and values).

These robust empirical findings provide a helpful backdrop for addressing two topics that have received much attention in the literature pertaining to the education and counseling of intellectually talented youth: multipotentiality and gender differences.

ADDRESSING PERCEPTIONS OF MULTIPOTENTIALITY

Implied in the preceding findings is that the assessment of abilities and preferences among the intellectually talented can be practiced at early ages and has significant applied psychological utility over the life span. Yet, this empirical evidence runs counter to an enduring perception among many who work with the gifted; that is, that most intellectually talented individuals can thrive in almost any vocation or career because of their multitude of high-level abilities and interests, a condition termed *multipotentiality* in the gifted literature (cf. Achter, Benbow, & Lubinski, 1997). Critiques and empirical findings notwithstanding (e.g., Achter et al., 1996; Kidner, 1997; Milgram & Hong, 1999; Sajjadi, Rejskind, & Shore, 2001), the perception of multipotentiality continues to be discussed as a critical barrier in career counseling with the intellectually talented (Kerr & Fisher, 1997; Rysiew, Shore, & Leeb, 1999). Because the concept of multipotentiality is likely to be encountered by those working with this special population, we feel compelled to further address it.

Operationally, multipotentiality has been said to be present in individuals who earn uniformly high scores across ability and achievement tests and exhibit multiple interests at equal intensities on interest inventories (Sanborn, 1979a, 1979b). Given such high-flat ability *and* interest profiles, multipotentiality is believed to lead to the reasonable consideration of multiple career options and difficulty with career choice (Fredrickson, 1986; Kerr & Ghrist-Priebe, 1988). But these high-flat profiles are found only with age-based instruments, if at all. When developmentally appropriate (i.e., above-level) assessment tools are used with this special population, a different picture emerges.

As we have reviewed, abilities and preference patterns among gifted adolescents are found to be differentiated when measures with enough "ceiling" or "top" are used. The first explicit demonstration of this, by Achter et al. (1996), was summarized earlier; and it has now been replicated at least twice. The first replication, by Kidner (1997), sampled gifted students (average age 15.9 years) from a residential, early college entrance program and found that the proportion of ability and preference profiles considered multipotential decreased when cognitively appropriate (i.e., above-level) ability (SAT), interest (Self-Directed Search), and values (Study of Values) measures were used. The second study, by Milgram and Hong (1999), used the top 5% of a slightly older (high school) sample of Israeli students who were first identified by a general ability measure used for military assignment. Through subsequent administration of math, verbal, and mechanical ability tests, they found that only between 20% and 23% produced the high-flat ability profile consistent with the concept of multipotentiality. Further, through codifying leisure activities to assess interest themes, the number of combined flat ability and interest profiles declined to 5.5%. Milgram and Hong reported one additional finding that runs counter to the notion of multipotentiality: Even among those with flat interest profiles, more of them were low-flat (no discernable interest) than high-flat (multiple interests).

These are the only three studies we are aware of that addressed multipotentiality empirically, and they are uniform in their findings. They also square well with what is known about correlations among the major ability areas (e.g., mathematical, verbal, spatial-mechanical) for individuals at different intellectual levels, namely, that more highly intelligent individuals are more likely to have jagged, or differentiated, ability profiles (Gottfredson, 2003; Lubinski, 2004).

Researchers who have identified multipotentiality among the intellectually talented through self-reported broad abilities and interests (e.g., Sajjadi et al., 2001; Shute, 2000), rather than using standardized ability and interest measures, reported a much higher incidence of multipotentiality (e.g., 84% of university honors students in Shute, 2000)—supporting the notion that many gifted persons perceive themselves as having diverse talents and interests. However, as the researchers examined other aspects of their participants' career perceptions, they discovered that the students did not, as was expected, report high levels of difficulty with career decision making (Shute, 2000), satisfaction, or general well-being (Sajjadi et al., 2001). In fact, those who perceived themselves as multipotential possessed greater than average confidence in finding a satisfying career (Sajjadi et al., 2001).

We believe the primary reason the notion of multipotentiality persists, in spite of the weight of available empirical evidence to the contrary, is that it is consistent with surface observations. This sentiment was echoed by Rysiew et al. (1999), who stated, "the *anecdotal and clinical reports* of counselors and psychologists who work closely with highly able adolescents and young adults continues to support the existence of a characteristic such as multipotentiality with both ability and interest dimensions" (p. 428, emphasis added). Even if their ability and interest profiles would show differentiation (which can only be determined through proper assessment), school performance and grade-level achievement test scores of the intellectually talented are typically well above average in several areas, and these students tend to possess greater interest in academic topics in general. To others, and even to talented students themselves (Sajjadi et al., 2001; Shute, 2000), this creates the perception of multipotentiality. By extension, these surface appearances make it seem evident that the intellectually talented have many more opportunities open to them than others (i.e., by virtue of their high abilities, they meet or exceed the *minimum* requirements of many occupations). While this may be true in purely numerical terms, it ignores the fact that, like for persons of all ability ranges, the unique combinations of abilities, preferences, and energies make any intellectually talented person *optimally* suited for only a subset of career areas.

The scientific evidence speaking to the issue of multipotentiality is important for helping us recognize that, despite outward appearances, we cannot assume that the gifted have undifferentiated, or flat, abilities and interests—in fact, most do not. It further informs us that even for those intellectually talented students who perceive themselves as having multiple and uniformly high abilities and interests, this perception will not necessarily create problems in educational/career decision making or ultimate satisfaction (Sajjadi et al., 2001). We understand how perceptions of multipotentiality arise and how they may even contribute to internal and external expectations that pull intellectually talented persons in multiple directions. However, we believe the robust empirical findings about stable educationally and vocationally relevant personal information offer a constructive reframing of these surface perceptions and open the door to a more helpful approach for assisting the intellectually talented in their personal development. This special population needs valid personal information about their abilities and preferences, at least as a starting point for meaningful conversation about their academic and career development. To be sure, clinical experiences can attenuate accurate perceptions in many ways (Dawes, 1994; Grove & Meehl, 1996; Meehl, 1986); but ultimately, conclusions should be based on the best empirical evidence.

GENDER DIFFERENCES AND SIMILARITIES

Much is often made of the differential educational needs of intellectually talented males and females. In the context of the individual differences model described in this chapter and elsewhere (Tyler, 1974), we believe there are two important statements to make about the influence of gender on identifying and nurturing intellectual talent. First, there are indeed some stable individual differences observed between the ability and preference profiles of gifted males and females. Although males and females do not differ in general intellectual ability, they do differ, on average, in certain specific cognitive abilities. Females show slightly greater verbal abilities in some areas than males, whereas males, on average, show greater mathematical and spatial abilities (Halpern, 2000; Kimura, 1999). On preference measures, males and females differ by more than one standard deviation on interest in working with people versus working with things (Lippa, 1998; Lubinski, 2000, p. 421); females as a group are more attracted to opportunities and environments involving the former, males the latter. Furthermore, males tend to show greater differentiation among preference domains, with females showing more breadth across preference themes (Achter et al., 1996, 1999; Lubinski & Benbow, 1992). In samples of highly talented male students, the most common Holland interest theme is Investigative and the most common value theme (using the Study of Values) is Theoretical; for highly talented female students, on the other hand, Investigative, Artistic, and Social interest themes are often found to be at comparable levels, as are their Theoretical, Aesthetic, and Social values on the SOV (Achter et al., 1999).

The second important statement is that the gender differences just described are equally predictive of outcomes (e.g., choice, success, and satisfaction) for both males and females, just as TWA would suggest. For instance, more females than males are likely to gravitate toward humanities, medicine, law, and social sciences, consistent with their higher verbal abilities and more balanced ability and interest profiles (Lubinski, Webb, et al., 2001; Webb et al., 2002). And more males than females are likely to gravitate toward physical and applied science areas, consistent with higher mathematical abilities and dominant Investigative interests, on average. It is important to note, as previously mentioned, that both males and females with high intellectual talent report similarly high levels of success and satisfaction with their educational and career choices over time. This even holds for the occupational classification of homemaker, which more talented women choose relative to similarly talented men (Benbow et al., 2000).

Another way to investigate the predictive equality of individual differences measures across genders was examined by Lubinski, Benbow, et al. (2001). Rather than selecting gifted students based on specific math and verbal abilities and following them over time, they instead compared the attributes of 368 males and 346 females who had already earned admission to prestigious math-science graduate programs. What they found among these males and females were many more similarities than differences. Specifically, both males and females in this sample were characterized by very high mathematical abilities, relatively weaker verbal abilities, and strong scientific preferences (i.e., dominant Investigative interests and Theoretical values) relative to all other preference domains. And mathematics tended to be their favorite course in high school. There were other salient similarities as well (see Lubinski, Benbow, et al., 2001, for details). While more males than females fit this ability-preference profile combination overall, in both the general population and among the intellectually talented, it appears to be the prototypic ability-preference profile, irrespective of gender, that fits highly select math/science environments. Most important for our purposes, these studies support the veracity of the individual differences model for identification and intervention with both male and female students with high intellectual talent.

FRAMING EDUCATIONAL/VOCATIONAL COUNSELING: INTERVENTIONS TO FOSTER FURTHERANCE

Given the longitudinal research summarized thus far, we are confident in making the best practice recommendation that counselors keep their focus on optimal development of intellectual talent by providing accurate, cognitively appropriate (e.g., above-level) information concerning students' abilities (mathematical, verbal, spatial-mechanical) and preferences (interests and values)—manifestations of their intellectual promise and personal passions. This information is useful in helping students make informed choices about where they might be *most* successful or *most* satisfied and, therefore, likely have the *most* positive personal and societal impact over time. It also foreshadows the likelihood of navigating successfully through the learning or training hurdles leading toward fulfilling and productive careers (Gottfredson, 2003).

Developmental theorist Sandra Scarr helps us to further conceptualize counseling interventions with the intellectually talented, giving theoretical substance to Pressey's (1955) idea of furtherance. Scarr (1996) asserted that the primary objective of human development is for individuals to become (more) uniquely themselves. Rather than being passive recipients of exclusively environmental determinants, Scarr emphasized that individuals play an active role in choosing, creating, and experiencing their environments based on their individuality—their unique personalities, interests, and talents—and this active role increases from childhood to adolescence to adulthood. The goal, then, for anyone, including counselors, trying to assist individuals in building on strength is to (1) identify and capitalize on their salient abilities and interests (nurturing their potential and finding their passion) and (2) encourage them to focus their energies on opportunities that align with their distinctive potential.

Lubinski (1996) noted that the individual differences tradition in psychology, into which TWA and other person-environment fit models clearly fall, dovetails nicely with Scarr's explication of development in its focus on facilitating psychological growth through the careful measurement of personal characteristics, followed by counseling to assist in planning developmentally appropriate courses of action (e.g., educational, mentoring, and training opportunities). This tradition emphasizes giving information and skills to individuals to enable them to take active roles in their own development (Pressey, 1955; Tyler, 1992; Williamson, 1965). As Lubinski stated, "optimal development occurs when opportunities are tailored to an individual's readiness to profit from opportunities" (p. 191). "Readiness" can be reliably evaluated through the systematic assessment of abilities and preferences organized around the TWA concepts of satisfaction (fulfillment) and satisfactoriness (competence).

An efficient way for counselors to help intellectually talented adolescents to obtain above-level ability testing is through participation in one of the four regional talent searches in the United States (hosted by Johns Hopkins University, Duke University, Northwestern University, University of Denver). These programs coordinate testing and supply interpretative materials to help talented students and their counselors make educational decisions based on test scores. Unfortunately, the talent searches typically do not offer preference or spatial ability assessments. However, counselors can easily add this component by administering one of the many instruments that assess spatial visualization (Humphreys et al., 1993; Humphreys & Lubinski, 1996; Lohman, 1988; Lubinski, 2003; Shea et al., 2001) and one of the number of inventories available designed to assess Holland's (1996) six themes of vocational interests. Note the special significance of spatial ability for identifying women likely not only to have interests in and commitment to the math/sciences but also to succeed in these areas with distinction (Figure 25.3, Panels A & B).

When combined, *comprehensive* ability and interest information will offer a more refined portrait of educational paths that are most likely to lead to genuine success and satisfaction. The next step, then, is to recommend developmentally appropriate opportunities in the educational environment. Essentially, the same counseling principles routinely applied to college-going high school seniors can be generalized to this special population. But instead of using ability and interest information to help in focusing considerations about college majors, the goal would be to use this information to discuss how developmentally appropriate learning opportunities might be structured. For adolescents, the decisions being made are more general and tentative in nature (e.g., what classes to take next semester) than choosing an occupation or career. These early decisions are nonetheless significant and have important implications for subsequent educational and career decisions of intellectually talented students because they typically choose careers requiring much advanced educational preparation (Benbow et al., 2000; Lubinski, Benbow et al., 2001).

Resource Needs

The institutional modifications necessary to support the model we have been espousing are relatively minimal, yet they can pay large dividends over time in the lives of intellectually talented students (Benbow & Stanley, 1996; Bleske-Rechek, Lubinski, & Benbow, 2004; Stanley, 2000). What is required in most cases is the flexible use of currently available educational resources, not significant additions in personnel or budget. For starters, this would include making available career counseling services and resources to intellectually talented middle school students. The more individualized these services could be, the better, with a baseline of facilitating talent search participation and making available valid career interest inventories. A next step in the schools would be allowing younger students to take courses when the assessment data suggests they are ready for them, rather than when they are offered to all students at a particular grade level (Colangelo & Davis, 2003; National Research Counsel, 2002, annex 6-1, pp. 11–14; Southern, Jones, & Stanley, 1993). While simple in concept, these modifications are not implemented without controversy and challenge in many places. For a thorough discussion of the sociopolitical landscape contributing to these challenges and a data-driven response, see Benbow and Stanley (1996).

Although thorough discussion of specific forms of educational interventions is beyond the scope of this chapter, a brief mention of some of the more common options is in order. In keeping with our focus on optimal development, we advocate most strongly for educational options that fall under the broad category of acceleration—educational practices that might more accurately be labeled "curricular flexibility" or "appropriate developmental placement" and which have longstanding and widespread empirical support for helping the intellectually talented without negatively affecting other students (Benbow & Stanley, 1996). Options that fit under this rubric and could be applied at various points during educational development include early admittance to school, grade skipping, entering college early, attending residential high schools tailored for gifted students, single (or multiple) subject acceleration, taking college courses while in high school, taking special fast-paced classes during the summer or academic year, taking advanced placement (AP) courses and exams, individual tutoring, and mentoring (excellent resources for further reading on these topics is found in Colangelo & Davis, 2003; National Research Council, 2002, annex 6-1, pp. 11–14; Southern et al., 1993).

The application of any of these options should consider that "learning is optimized, as is growth in achievement motivation, when the individual is presented with tasks that match or slightly exceed [current] capabilities" (Benbow & Stanley, 1996, p. 274). Counselors need also to remain vigilant that the educational environments secured by highly motivated and intellectually talented students are of high quality. Just as psychotherapeutic interventions with the same label can vary widely in their application (Dawes, 1994), programs designed for intellectually able students can represent a great deal of heterogeneity as well (Bleske-Rechek et al., 2004). For these reasons, counselors are also encouraged to monitor the reactions of their students to ensure that their educational needs are being met. Longitudinal findings from intellectually precocious youth now in adulthood have found overwhelmingly positive subjective reactions (Benbow et al., 2000; Benbow, Lubinski, & Suchy, 1996; Lubinski, Webb, et al., 2001) as well as better objective outcomes (Bleske-Rechek et al., 2004; Cronbach, 1996) resulting from accelerative learning opportunities.

LIMITATIONS AND FUTURE DIRECTIONS

While the model presented here represents a time-tested, empirically validated approach to educational/career counseling with talented youth, there still remain important gaps to be addressed in the future. First, despite the reliability and validity supporting the use of above-level ability and preference assessments for educational counseling, they still provide only rough guideposts for facilitating educational and career planning. Indeed, periodic reassessment of these personal attributes over the course of an individual's adolescence is advisable. Abilities and interests can and do change for some individuals, and assessing the magnitude of such changes is helpful for making informed educational and career choices.

Second, the talent search model that most systematically applies the above-level testing model we espouse currently fails to systematically incorporate measures of spatial abilities. As we strive not to miss those students who might usefully contribute to our increasingly technological society, identifying spatially talented individuals is one of the current critical challenges in the field. Indeed, using normal curve theory (Shea et al., 2001), it is estimated that approximately half of the top 1% in spatial visualization are not identified by modern talent search procedures that focus only on mathematical and verbal talent. These students will not necessarily find their own way if their exceptional spatial talents are not recognized and nurtured (Gohm, Humphreys, & Yao, 1998).

Finally, it is clear from studies drawing on SMPY samples that success and satisfaction are also based on other personal determinants not adequately captured by assessing conventional abilities and interests. Our studies have revealed, for instance, that even among individuals who possess comparable ability and preference profiles and who have been given similar opportunities, sizable individual differences in achievement are routinely observed. Counselors need to be aware of the individual differences in energy and time that people invest in developing their careers (e.g., Lubinski & Benbow, 2000, p. 143; Figure 25.2). While we do not know all the causal determinants relevant to modeling individual differences in achievement, creativity, and work performance, we believe that the conative factors (i.e., mental characteristics contributing to purposeful action) are critical elements begging for valid methods of measurement and subsequent research (Jensen, 1996; Lubinski, 2004). These include attributes variously referred to as capacity to work, industriousness, persistence, zeal, energy, and psychological tempo—characteristics that have been highlighted since the time of Aristotle, extending to modern theoreticians studying art, athletics, business, the military, politics, and science, among others (Ericsson, 1996; Eysenck, 1995; Gardner, 1993; Lubinski & Benbow, 2000; Simonton, 1988). Some persons seem to have great mental ability (e.g., high IQ), but appear to lack the energy needed to fully actualize their intellectual potential. Indeed, it is likely that under- and overachievers are distinguished, in part, by this set of attributes. Like all special populations, intellectually talented kids are not a categorical type.

SUMMARY

> Our deepest calling is to grow into our own authentic self-hood. . . . As we do so, we will not only find the joy that every human being seeks—we will also find our path of authentic service in the world. (Palmer, 2000, p. 16)

Like students at all ability levels, intellectually talented students are faced with a range of opportunities and challenges as they seek to understand, develop, integrate, and, ultimately, apply their intellectual promise and their personal passions—or, as Palmer (2000) would put it, to grow into "authentic self-hood" and find both "joy" (satisfaction) and "authentic service in the world" (success). We submit that the early application of vocational assessment methods for measuring abilities and preferences can be used confidently by counselors to provide windows into authentic self-hood. We might also say that they afford insight into barriers to personal authenticity. They are incomplete and imperfect windows, to be sure, but they are nonetheless useful and represent the most accurate and objective tools we have at the present time. They can be especially helpful in clarifying choices in the face of potentially conflicting views from family, peers, teachers, and self on how best to structure an individual's educational, vocational, and personal development (Lubinski & Benbow, 2001). Indeed, a cogent case could be made that failing to employ these construct-valid measures—or, practicing a "truncated view of vocational counseling"—contributes to "educational and occupational maladjustment," which, years ago, Paterson (1957) called on applied psychologists to alleviate with practice based on science.

We hope that counselors choosing to work with the most talented students find merit in the idea that a scientifically valid place to start is early assessment of personal characteristics relevant to educational and career environments, followed by access, support, and encouragement to pursue developmentally appropriate opportunities. These two connected, and seemingly simple, steps will have profound impact on facilitating the optimal development of intellectual talent and propelling talented youth toward achieving rewarding and socially valued lives. In light of this, our charge as counselors with this special population has been succinctly put by Benbow and Stanley (1996): "If we want talented individuals to be well prepared when society needs them, we need to be there for them when they need us" (p. 279). May we respond enthusiastically to this charge.

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