Talent Search

Paula Olszewski-Kubilius and Dana Thomson

Abstract

This chapter discuss the practices of, research in, and important issues regarding talent search, a well-established and researched model of identification and programming for gifted learners. This chapter consists of five main sections. First, it describes three defining features of the the talent search model, which includes (a) an emphasis of domain-specific assessments over general cognitive ability testing (e.g., IQ testing) and highlight above-grade level or off-level assessments (e.g., tests designed for older students) over grade-level tests; (b) providing a variety of outside-of-school programming matched to students' domain and level of talent as shown in the above-grade level tests; and (c) offering parents many academic advising and counseling resources, such as future course taking and education programs for their children, parenting, and academic and career planning. Second, this chapter briefly discusses the prevalence of talent search practices in the United States. Third, It presents some existing data concerning the performance of talent search students on above-grade level tests compared with the performance of average older students on grade-level tests. Fourth, it summarizes some empirical research that investigated whether talent search scores predict long-term outcomes such as achievement in higher education or early career success. In particular, it elaborates on some existing research on the Study of Mathematically Precocious Youth (SMPY), a talent search program that has been extensively study. Lastly, this chapter discusses the implications of talent search programs and research as well as the limitations of talent search models.

What is Talent Search?

Talent Search is a term that refers to a model of identification and programming for gifted learners. Talent Search began over 30 years ago with the pioneering work of Julian Stanley, an educational psychologist at Johns Hopkins University. Stanley was interested in mathematical reasoning ability, specifically precocious ability, and began using tests such as the SAT with middle-school-aged children, to assess and document the level of their ability. Over time, Stanley's research grew into a systematic and deliberate effort to identify and nurture mathematical, and later, verbal reasoning abilities in children on a wide scale. Testing was offered to many children, along with follow-up advising. Today, guided by the philosophy that appropriate assessment is essential to finding a proper match between students' abilities and academic programming, Talent Search programs are currently carried out by universities and centers across the US in regional or state delivery systems and involve approximately 200,000 students annually.

The defining features of the Talent Search model include:

1. *Domain specific, off-level assessment*. Talent Search involves giving elementary and middle school students tests that are typically given to older students, including the Explore test that is designed for 8th graders and taken by 4th through 6th grade talent search participants, and the SAT and ACT, which are designed for high school juniors and seniors applying to college and taken by 7th through 9th grade Talent Search participants. Each of these tests has multiple

subtests such as reading, math, English, or science reasoning (Corwith & Olszewski-Kubilius, 2012a; Olszewski-Kubilius & Kulieke, 2008).

Talent Search emphasizes domain-specific testing over assessment of general cognitive ability, such as IQ testing, for gifted students for several reasons. One is that as children develop and mature, their abilities naturally differentiate. That is, they show relative strengths and weaknesses in different areas of intellectual reasoning ability, e.g. higher in mathematical reasoning compared to verbal reasoning or vice versa. Tests with multiple and varied subtests can capture these cognitive profiles and yield a more useful and comprehensive picture of an individual student's abilities that can be used for educational placement and advising.

Talent Search also uses what is referred to as "above-grade level" or "off-level" level assessment, meaning tests designed for older students. Because gifted students often have advanced levels of knowledge as well as exceptional reasoning abilities, grade-level tests are not suitable to accurately measure their abilities due to having too low a ceiling, i.e. not enough difficult items on the test for gifted children. In fact, students qualify for participation in Talent Search by scoring in the top 5 to 10% of students on a standardized, math or reading, grade-level, achievement test. These students are scoring at the ceiling of the grade level tests and cannot show any further growth on those tests. An instrument with a higher ceiling is needed to get a more accurate picture of their true level of performance, specifically how far above grade level students are currently able to reason and think. Scores on above-grade level instruments such as the ACT or SAT or Explore, provide more detailed and

more accurate information on which to base decisions for educational placement and acceleration. Research has empirically validated the use of qualifying scores of the 95th percentile or above on in-grade achievement tests for participation in Talent Search (Ebmeir & Schmulbach,1989; Lupkowski-Shoplik & Swiatek, 1999).

2. *Outside-of-school Programming Matched to Students Domain and Level of Talent.* The Talent Search centers offer a variety of programming options and opportunities for talent search participants subsequent to testing. These include weekend enrichment classes, summer classes and distance education programs. Some of these programs enable students to take required school courses such as biology or Algebra 1 early or in an accelerated format (e.g. completing a full year high school course in three weeks in the summer, Olszewski-Kublius, 2004). Other classes offer enrichment opportunities and supplement, rather than replace, typical school courses and programs (Olszewski-Kubilius, 1998a).

3. *Academic advising and counseling*. Through print and online materials, Talent Search centers offer many information resources to parents. These include interpretive information regarding Talent Search scores and their implications for future course taking and educational programs; guides to summer program and other outside-of-school, supplemental educational opportunities; general information about parenting and the characteristics and needs of gifted children; and recommendations regarding future course taking, etc. They also offer parent education workshops and webinars as well as workshops and degree programs for educators in gifted education (Corwith & Olszewski-Kubilius, 2012b).

How Prevalent is Talent Search?

The most recent nation-wide data on participation in talent search indicates that nearly a quarter of a million 4th through 9th graders participated in testing in 2002-2003 (Lee, Matthews, & Olszewski-Kubilius, 2008). Of these, the majority, 68% were 7th or 8th graders when they tested, while 30% were in 4th through 6th grade. Compared to their representation in the US population, Latino/Hispanic students were under-represented among Talent Search participants (4.35% versus 14.1%), as were African-American students (9.8% versus 12.8%) and Caucasian students (76.5% versus 80.4%), while Asian Americans were over-represented (6.3% versus 4.2%). Low-income students, with family incomes less than $20,000, were also under-represented compared to national level data (3.1% versus 28.3%).

Of the students who participated in talent search, 33,000 went on to partake of educational programs that the Talent Search centers offer. Many more students participate in educational programs offered by other gifted centers, gifted schools, community organization, and school districts (Lee, Matthews, & Olszewski-Kubilius, 2008).

How Do Talent Search Students Perform on the Off-Level Tests?

Scores obtained by Talent Search participants vary, covering most of the range of scores possible on the test (Olszewski-Kubilius & Kulieke, 2008; Olszewski-Kubilius, 1998b). The average Talent Search participant tends to score higher than the typical 8th grader who takes the Explore test, despite being 2 to 3 years younger (Center for Talent Development, 2010). The average Talent Search participant scores about the same as high school seniors who plan to go to college on the ACT

test. And the average Talent Search participant scores slightly lower (by 26 to 30 points) than the typical college bound senior on the SAT test.

Significant numbers of Talent Search participants taking these off-level tests score better than the average older student who is taking the test on-level. For example, 35% of 7th graders and 52% of 8th graders score above the mean of college-bound students on the reading subtext of the ACT. Similarly, 25% of 7th graders and 35% of 8th graders scores above the mean of college bound students who take the SAT verbal. Percentages for ACT–Math are 20% and 42% for 7th and 8th graders respectively, and for SAT-Math are 24% and 43% for 7th and 8th graders respectively (Center for Talent Development, 2010). These data collectively indicate that the off-level tests used by Talent Search centers are not too difficult for the younger students taking them, a typical concern of educators and parents, and that many students have developed reasoning abilities well beyond expectations based on their chronological age and grade that would not have been revealed by grade level tests alone.

Research on the Predictive Validity of Talent Search Scores

One of the most important issues within the field of gifted education and talent development is identification, particularly the efficacy of identification protocols and assessment tools. Important questions are: Do scores on identification batteries select students who benefit from and succeed in gifted programs? Do these scores predict long-term outcomes such as achievement in higher education or early career success?

Talent Search programs use scores on the SAT, ACT or Explore for entrance into their programs. Different scores may be required depending upon the focus of the course and the degree of acceleration or pacing of the program or course. For example, scores on the ACT or SAT reading might be used for entrance into an accelerated high school biology course that involves a lot of advanced vocabulary and critical reading, whereas SAT and ACT math scores might be used for a mathematically based high school physics course. Similarly, a summer program course that compresses a full year high school course into three weeks will require higher entrance scores than a distance learning course that is advanced in content but runs over a 9 month period.

Empirical data from research studies support these practices and uses of Talent Search scores. Typically, Talent Search summer programs involve selecting students who score at or above the average for college bound seniors and placing them in "fast-paced" courses that compress a full year high school level course into a three-week summer experience, or 120 hours of in-class instruction reduced to 75 to 80 hours. Research has documented that students are successful, as measured by performance on standardized subject tests and course grades in fast-paced literature and mathematics classes (Olszewski-Kubilius, Kulieke, Willis and Krasney, 1989). Lynch (1992) found that middle school students who took high school science classes such as biology, chemistry and physics in a three-week summer program performed as well or better on standardized subject tests compared to typically aged high school students who had had a full year course in the same subject.

Research has documented the efficacy of other accelerative educational models that use Talent Search scores. Middle school students who score above the average for college-bound seniors on the SAT are successful in programs that condense four years of high school math or English into two years, thereby giving these students early access to AP courses in high school (McCarthy, 1998; Benbow, Perkins, & Stanley, 1983). The relationships between higher Talent Search scores and success in programs that involve a higher degree of acceleration is also supported by research. For example, Bartkovich and Mezyniski (1981) found that students who scored at 600 or above on the SAT-Math could successfully complete two high school mathematics courses in just 50 hours of in-class time using a diagnostic-prescriptive approach to instruction.

In addition to the pacing of instruction, research has also validated that Talent Search scores are useful for determining students' readiness for early access to advanced courses. Kolitch & Brody (1992) found that most Talent Search participants who took high school or college level mathematics classes several years earlier than is typical, performed well in them, receiving A or B grades for those classes. Importantly, these students' subsequent performance in mathematics was not negatively affected by being accelerated in math nor by studying mathematics in a fast-paced course. Students were well prepared and successful in subsequent mathematics courses, earning good scores on the AP calculus examination (Kolitch & Brody) and high grades in subsequent science courses (Mills, Ablard, & Lynch, 1992), and proceeded on to take appropriate and advanced mathematics classes in college (Kolitch & Brody). Lubinski and Benbow (2006) conclude, "Above-level

assessments are critical, therefore, for properly structuring educational curricula and being responsive to individuality" (p. 318).

Students who elect to participate in Talent Search receive valuable information about their academic abilities in several key domains of learning and this information can help them, their families and their educators make decisions about placement and course taking. Research has shown, however, that students who participate in Talent Search testing and also Talent Search education programs reap additional benefits. Compared to students who tested only, Talent Search participants who also participated in summer programs were more likely to continue to accelerate their study within a subject area and opt for more challenging and rigorous educational programs while still in high school, enter more selective undergraduate institutions, and enter college early (Barnett & Durden, 1993; Swiatek & Benbow, 1991; Olszewski-Kubilius & Grant, 1996). Effects of participation are especially pronounced for female students and included a tendency to use accelerative options more frequently than equally talented females who had not participated in fast paced summer mathematics programs, and at levels comparable to mathematically talented males (Fox, Brody and Tobin, 1985). These positive effects of participation in Talent Search education programs make be due to increased confidence and raised expectations of oneself, which in turn influence future choices regarding course-taking and extracurricular activities (Olszewski-Kubilius, 1998a).

The Study of Mathematically Precocious Youths (SMPY)

Talent Search participants have been studied extensively through the Study of Mathematically Precocious Youth (SMPY), begun in 1971 by Dr. Julian Stanley and his colleagues at Johns Hopkins University. This comprehensive research study is now carried out by David Lubinski and Camilla Benbow at Vanderbilt University. SMPY consists of a multi-faceted research program that includes following groups of Talent Search participants longitudinally, much like the Terman studies. SMPY has yielded a great deal of information about the paths of Talent Search participants as they go through high school, enter higher education and begin careers. The SMPY research has addressed some significant issues within the field of gifted education.

One of these is the broad issue of the relationship between giftedness in childhood and giftedness in adulthood and, specifically, the predictive validity of measures of giftedness in children for indices of adult success and creative productivity. Scholars in the field often hear the criticism that many children who participate in gifted programs do not end up demonstrating exceptional levels of achievement, success, or creative productivity in adulthood. Alternatively, many highly creative and successful individuals report that they were not identified as gifted in childhood nor placed in gifted programs in their schools. What is the evidence regarding the long-term predictive validity of Talent Search scores?

1. A 20-year follow-up of individuals who participated in Talent Search showed that 30% of those students with SAT-M or SAT-V above 500 in middle school (close to the average for college bound seniors) secured doctorates in STEM areas, while 50% of those scoring above 700 did so (Benbow, Lubinski, Shea & Eftekhari-Sanjanni, 2000; Lubinski, Benbow, Webb & Bleske-Rechek, 2006). The

base rate for earning a doctorate in the US is 1%. “That a 2 hour test can identify 12-year olds who will earn this ultimate educational credential at 50 times base-rate expectation is remarkable” (p. 318, Lubinski & Benbow, 2006). These data support the predictive validity of the off-level testing that is the main component of the Talent Search model.

2. Differences in abilities as represented by off-level test scores matter even at the upper end of the score distribution. Lubinski and Benbow (2006), assert that one third of the entire range in ability resides in the top 1% of ability. A study comparing the adult achievements of Talent Search students whose SAT-M scores placed them in the top quartile of the top 1% of ability to students whose scores placed them in the bottom quartile of the top 1% revealed striking individual differences. Top quartile performers earned STEM doctorates at a higher rate, had higher incomes, earned more patents and had secured more tenured positions at top tier research universities. These research findings are significant because they debunk a widely held belief among researchers and practitioners that there is a threshold beyond which higher levels of ability do not matter in terms of adult achievement. Wai, Lubinski, and Benbow (2005) write, “...the data reported here on secured doctorates, math-science PhDs, income, patents, and tenure track positions at top U.S. universities collectively falsify the idea that after a certain point more ability does not matter.” (p. 489). These results also suggest that domain specific ability measures like the SAT predict creatively oriented career achievements such as significant research projects and innovative products.

3. The longitudinal studies from the SMPY have also shown that patterns of ability as revealed by performance on verbal, mathematical and spatial reasoning tests are predictive of the field in which an individual makes his or her creative accomplishments in adulthood. Park, Lubinski, and Benbow (2007) followed a large sample of Talent Search participants longitudinally and found that "ability tilt", that is whether SAT-Math scores were higher than SAT-Verbal scores or vice versa, predicted whether their adult accomplishments were in the literary domain or the STEM domains. The adult accomplishments included earning advanced degrees and tenure track positions in the STEM versus the humanities and producing literary publications or scientific articles or obtaining patents. Spatial ability scores, currently not assessed in Talent Search programs, are also predictive of interest in and entry into STEM fields, especially engineering and physics, as well as adult accomplishments in these fields. Lubinski and colleagues urge Talent Searches to find a way to include spatial ability assessments into their programs so as to not miss students with potential for STEM achievement (Wai, Lubinski, & Benbow, 2009).

4. A central issue for the field of gifted education is whether participation in gifted programs makes a difference in terms of students' long-term achievements. Do these programs facilitate commitment to high level achievement in higher education? Do they alter or facilitate students' career paths? Do students who participate in gifted programs achieve at higher levels compared to equally talented students who do not? Wai, Lubinski, Benbow and Steiger (2010) examined the paths and accomplishments of a group of individuals who had been identified as

mathematically talented in middle school by virtue of their performance on the SAT-M. All of the study participants retrospectively reported their participation in advanced classes such as STEM AP courses and dual enrollment programs as well as in enrichment activities both in and outside of school such as science fairs and math competitions, clubs, summer programs, etc. Individuals with "notable STEM accomplishments" such as getting a doctorate in STEM and choosing a STEM career, having STEM publications, and securing tenure in a STEM field, had a richer STEM educational dose consisting of a larger number and variety of precollege STEM experiences. Differences in ability between high and low dose groups were small and could not account for the differences in STEM accomplishments. The finding was replicated with students who had attend top STEM graduate programs in the U.S., suggesting that motivation also could not account for the differences. This research adds to the growing body of evidence that educational opportunities play a significant role in the development of gifted children, leading them towards continued paths of achievement into early adulthood. University based Talent Search programs provide these opportunities to many gifted students.

Implications of the Talent Search Programs and Research

1. Domain specific assessment matters, particularly if instruments are used that have sufficient ceiling to detect above-grade-level performance and provide information that is useful for placement of students in special educational programs. These programs include ones that accelerate the pacing and level of content learning. In addition, patterns of performance across tests that measure different broad areas of ability such as mathematical, verbal and spatial reasoning ability are

useful, along with knowledge of students' interests, in predicting college major and careers. Results of these assessments can be used by parents and educators to help students make choices with respect to courses to take and/or outside of school programs to participate in.

2. Level of ability matters, and individual differences even in the top 1% of ability are meaningful and associated with differences in adult accomplishments. These differences need to be matched with appropriate programming including a sufficient degree of acceleration and individualized pacing.

3. Educational programming matters, particularly the amount and variety of experiences that are matched to a student's interests and level of ability. These can include opportunities for both acceleration and enrichment, both through school and outside-of-school programs. Educational dose is related to whether students proceed down talent development paths and to their adult accomplishments.

4. Instructional approaches and policies matter. Important components of any instructional approach for gifted learners include all forms of acceleration (e.g. curriculum compacting, fast-paced classes, telescoping, subject area acceleration) that enable students to study advanced content earlier and at a faster pace. Policies that support acceleration (e.g. early entrance to all levels of schooling), allow for earlier specialization of course-taking in areas of talent, award credit for courses taken outside of school walls, and support individualization of school programming facilitate gifted students continuous talent development.

Limitations of Talent Search

One of the biggest limitations of research on Talent Search students is the lack of diversity among the students who choose to participate in it. There are several reasons for this, including the fees that are charged for participation. Additionally Talent Search program administrators rely on counselors and administrators at schools to identify students to participate in Talent Search, pass out materials about the programs, run parent meetings to address parental concerns, etc. Schools that are willing and able to do this, tend to have more resources and be located in more advantaged neighborhoods. Talent Search participants tend to be over-represented in terms of White and Asian students and higher-income students. Results from research studies involving Talent Search students, therefore, cannot be generalized beyond the culturally mainstream students that comprise the majority of participants. In addition, because Talent Search relies heavily on standardized testing, it captures students whose abilities are developed and can be demonstrated via test performance. As is the case with using any kinds of standardized tests to assess talent, students who have less than propitious home or school environments, are twice exceptional, or are newly learning English, will likely not perform as well and the tests may underestimate their abilities. Talent Search centers offer scholarships for testing fees and tuition for their educational programs and some have designed programs specifically for students with potential but not demonstrated achievement on standardized tests (see descriptions of Project Excite at the Center for Talent Development).

References

Barnett, L. B., & Durden, W. G. (1993). Education patterns of academically talented youth. *Gifted Child Quarterly,* 37(4), 161-168.

Bartkovich, K. G., & Mezynski, K. (1981). Fast-paced precalculus mathematics for talented junior high students: Two recent SMPY programs. *Gifted Child Quarterly, 25*(2), 73-80.

Benbow, C. P., Lubinski, D., Shea, D. L., & Eftekhari-Sanjani, H. (2000). Sex differences in mathematical reasoning ability: Their status 20 years later. *Psychological Science, 11*, 474-480.

Benbow, C. P., Perkins, S., & Stanley, J.C. (1983). Mathematics taught at a fast pace: A longitudinal evaluation of SMPY's first class. In C. P. Benbow & J. C. Stanley (Eds.), *Academic precocity: Aspects of its development* (pp. 51-78). Baltimore, MD: Johns Hopkins University Press.

Center for Talent Development. (2010). Northwestern University's Midwest Academic Talent Search Statistical Summary. Evanston, IL: Author.

Corwith, S., & Olszewski-Kubilius, P. (2012a). Talent search. In T. Cross & J. R. Cross (Eds.), *Handbook for school counselors serving gifted students* (pp. 543- 554). Waco, TX: Prufrock Press.

Corwith, S., & Olszewski-Kubilius, P. (2012b). Academic planning for gifted students. In T. Cross & J. R. Cross (Eds.), *Handbook for school counselors serving gifted students* (pp. 477-494). Waco, TX: Prufrock Press.

Ebmeier, H., & Smulbach, S. (1989). An examination of the selection practices used in the talent search program. *Gifted Children Quarterly*, *33*(4), 134-141.

Fox, L. H., Brody, L., & Tobin, D. (1985). The impact of early intervention programs upon coursetaking and attitudes in high school. In S. Chipman, L. R. Brush, & D. M. Wilson (Eds.), *Women and mathematics: Balancing the equation* (pp. 249-274). Hillsdale, NJ: Erlbaum.

Kolitch, E. R., & Brody, L. (1992). Mathematics acceleration of highly talented students: An evaluation. *Gifted Child Quarterly, 39*, 78-86.

Lee, S. Y., Matthews, M. S., & Olszewski-Kubilius, P. (2008). A national picture of talent search and talent search educational programs. *Gifted Child Quarterly, 52* (1), 55-69.

Lubinski, D., & Benbow, C. P. (2006). Study of Mathematically Precocious Youth after 35 years: Uncovering antecedents for the development of math-science expertise. *Perspectives on Psychological Science*, *1*(4), 316-345.

Lubinski, D., Benbow, C. P., Webb, R.M., & Bleske-Rechek, A. (2006). Tracking exceptional human capital over two decades. *Psychological Science*, *17*, 194-199.

Lupkowski-Shoplik, A., & Swiatek, M. A, (1999). Elementary students talent searches: Establishing appropriate guidelines for qualifying test scores. *Gifted Child Quarterly, 43*(4), 265-272.

Lynch, S. J. (1992). Fast-paced high school science for the academically talented: A six-year perspective. *Gifted Child Quarterly*, *35*(3), 147-154.

McCarthy, C. R. (1998). Assimilating the Talent Search model into the school day. *Journal of Secondary Gifted Education, 9*(3), 114-123.

Mills, C. J., Ablard, K. E., & Lynch, S. J. (1992). Academically talented students' preparation for advanced-level coursework after individually-paced precalculus class. *Journal for the Education of the Gifted*, *16*(1), 3-17.

Olszewski-Kubilius, P. (2004). Talent searches and accelerated programming for gifted students. In N. Colangelo, S. G. Assouline, and M. U. M. Gross (Eds.), *A nation deceived: How schools hold back America's brightest students, Vol. II* (pp. 69-76). The Templeton National Report on Acceleration. Iowa City; University of Iowa.

Olszewski-Kubilius, P. (1998a). Research evidence regarding the validity and effects of talent search educational programs. *Journal of Secondary Gifted Education*, *9*(3), 134-138.

Olszewski-Kubilius, P. (1998b). Talent search: Purposes, rationale and role in gifted education. *Journal of Secondary Gifted Education, 9*(3) 106-114.

Olszewski-Kubilius, P., & Grant, B. (1996). Academically talented women and mathematics: The role of special programs and support from others in acceleration, achievement, and aspiration. In K. D. Noble & R. F. Subotnik (Eds.), *Remarkable women: Perspectives on female talent development* (pp. 281-295). Cresskill, NJ: Hampton Press.

Olszewski-Kubilius, P., & Kulieke, M. J. (2008). Using off-level assessment for gifted and talented students. In J. VanTassel-Baska (Ed.), *Alternative assessments with gifted and talented students* (pp. 89-106). Waco,TX: Prufrock Press.

Olszewski-Kubilius, P., Kulieke, M.J., Willis, G.B., and Krasney, N. (1989). An analysis of the validity of SAT entrance scores for accelerated classes. *Journal for the Education of the Gifted, 13*(1), 37-54.

Park, G., Lubinski, D., & Benbow, C. P. (2007). Contrasting intellectual patterns predict creativity in the arts and sciences. *Psychological Science, 18*(11), 948-952.

Swiatek, M. A., & Benbow, C. P. (1991). A ten-year longitudinal study of students in a fast-paced mathematics program. *Journal for Research in Mathematics Education*, *22*, 138-150.

Wai, J., Lubinski, D., Benbow, C. P., & Steiger, J. H. (2010). Accomplishment in science, technology, engineering, and mathematics (STEM) and its relation to STEM educational dose: A 25-year longitudinal study. *Journal of Educational Psychology, 102*(4), 860-871.

Wai, J., Lubinski, D., & Benbow, C. P. (2009). Spatial ability for STEM domains: Aligning over 50 years of cumulative psychological knowledge solidifies its importance. *Journal of Educational Psychology, 101*(4), 817-835.

Wai, J., Lubinski, D., & Benbow, C. P. (2005). Creativity and occupational accomplishments among intellectually precocious youths: An age 13 to 33 longitudinal study. *Journal of Educational Psychology*, *93*(3), 484-492.