Making Giftedness Productive

Herbert J. Walberg and Susan J. Paik

What may best distinguish our approach from that of others is its emphasis on accomplishment in the case of children and youth, and eminence in the case of adults. For us, accomplishment rather than potential is the best indication of giftedness. Giftedness is only one of several factors that may affect how much a person attains over the course of childhood, youth, or a lifetime. For example, without large amounts of intensive practice, parental support, and expert instruction, giftedness rarely comes to full fruition.

Though fundamentally psychological and educational, our approach is derivative of the “new economics” that broadly applies well-established economic principles to explain human behavior outside its traditional monetary purview, including learning, human and social capital, marriage, divorce, crime, addictions, suicide, and other phenomena (Becker, 1976). This economic approach employs only a few central ideas to parsimoniously explain and predict a wide variety of human behavior.

Provocative and productive, new applications of economics echo the original Greek meaning of the term – the management of household affairs. Though founded in agreed-on theory, the economic principles accord well with common sense and have many practical applications. For example, dealing with scarcity – not just of money, but of time, energy, and attention – is a classic problem not only of economics but of human life. Economists also influence policy makers because they explicitly quantify the benefits, costs, and risks that should weigh heavily in rational decision making.

Can economic ideas help us think more clearly about making giftedness fruitful or, in the language of economics, “productive”? The “opportunity costs” of notable accomplishment or eminence in violin playing preclude top ballet performance and world-class chess. To reach a field’s pinnacle may require a decade of a child or youth’s intense concentration and, as a consequence, the sacrifice of other valuable pursuits. The highest accomplishments require not only such “foregone opportunities,” but also
the effortful “investments” of dedicated parents, expert teachers, eminent practitioners, and peers competing for the highest standards. Though difficult to impute, value of the “social capital,” attention, and time invested may far outweigh the monetary costs.

Should investments be broad or concentrated? Though general knowledge and skills in language and mathematics are foundations of many pursuits, deep knowledge and exemplary mastery of a special, even a very narrow, field is often most prized. In our modern “division of labor,” such special expertise enables eminent individuals to provide the breakthroughs and otherwise missing ingredients for solving problems and achieving great feats. Modern technology and communications, moreover, increasingly make for a “winner takes all” phenomenon. Why listen to a second-rate hometown cellist or read less than top-ranked writing when the world’s best are now readily available in convenient modern media, particularly the Internet?

Thus, goals and costs should weigh heavily for youngsters who may have potential for making their giftedness productive. Much psychological research shows that setting specific, challenging goals leads to higher performance than setting easy goals, “do your best” goals, or no goals. “Goals,” it has been concluded, “affect performance by directing attention, mobilizing effort, increasing persistence, and motivating strategy development. Goal setting is most likely to improve task performance when the goals are specific and sufficiently challenging . . . feedback is provided . . . the experimenter or manager is supportive, and assigned goals are accepted by the individual” (Lock, Shaw, Saari, & Latham, 1981, p. 125).

Time costs should also be a crucial consideration. East Asian K–12 students generally achieve the highest test scores in the world in mathematics and science. Asian countries have challenging, nationally uniform school achievement goals, and students spend from 80 to 100 percent more total hours in regular and tutoring schools and in homework during the first 18 years of life (Paik, Wang, & Walberg, 2002).

“Scarcity,” a fundamental idea in economics, suggests how productive giftedness might be realistically considered. Out of 1 million piano, chess, or basketball players, perhaps 1, 10, or 100 can make a living in one of these fields. Perhaps 1, 2, or none are truly world class. Such scarce fruition of giftedness is likely to be generously rewarded in prestige, honor, and compensation – but perhaps not in happiness.

For these reasons, “modern portfolio theory of investment” should loom large in the thinking of parents, teachers, coaches, policy makers, and the gifted themselves. Financial investment of all assets in one stock may result in high gain at high risk but may also result in catastrophic loss. Investing all of a child’s attention and time, and parents’ money, in support of chess or one of the performing arts is highly unlikely to yield monetary returns or even much recognition. Yet, it might. And the pursuit may be more
satisfying than any result, even though such calculations of the future are subject to great risk, uncertainty, and subjectivity.

The conventional solution to the risk problem in financial investment is “diversification” in a portfolio of items preferably unrelated to one another so that even if one does not prove fruitful, another might. Thus, by analogy, the aspiring violinist takes Advanced Placement biology in case a medical career later seems practical. Yet, a “trade-off” is implied: The time taken from the violin for science may mean second-rate violin playing and the possible disappointment or delight of finding one calling or another. Had Isaac Newton and Albert Einstein been more scientifically encouraged as youngsters, would they have contributed even more to physics instead of engaging in public affairs?

Neither economics nor psychology can answer the vexing value questions raised by such career possibilities. But, along with wise parents and expert teachers and coaches, both disciplines can help illuminate what is required for accomplishments and even eminence in various fields so that parents and youngsters can make informed decisions. Toward that end, this chapter explains the findings of our research program and sets forth what makes for exceptional performance in school and in nonacademic pursuits. It summarizes our studies of the childhood traits and environments of eminent men of Western history and of 20th-century American women, as well as the family and school environments of 20th-century gifted adolescents.

CONCEPTIONS OF PRODUCTIVE GIFTEDNESS

More than two centuries ago, Adam Smith (1776) declared that the wealth of nations depends not only on financial and physical capital such as money, land, buildings, and machines but also the “complementary” abilities of people. As interpreted in this century, “human capital” refers to workers’ knowledge and skills – assets that are by far the most valuable to themselves and society. Because our attention and time are severely limited, allocating them efficiently to developing human capital is the key to creativity, prosperity, and the quality of life. Parents’ and educators’ efforts to develop youths’ portfolio of knowledge and skills are perhaps the best of all long-term investments.

PORTFOLIO THEORY

Productive giftedness may be better understood if costs and benefits are better understood or even imputed and analyzed. Childrearing costs, for example, may be thought of as foregone earnings of parents; increased adult earnings of the child may be viewed as a primary benefit. Investments to make giftedness productive, however, may be motivated by
nonmonetary benefits: Productive giftedness may bring not only honor and prestige to the individual but also great benefits to society, such as a medical breakthrough or artistic insight.

The nonmonetary rewards may include altruistic satisfaction in seeing others benefit from one’s work and the joy of creative accomplishment – subjective but real incentives for accomplishment and eminence. The productively gifted may also be paid more, but the work of outstanding writers and artists might be recognized as outstanding long after its production or even after their demise. Clear examples are James Joyce (1882–1941), perhaps the greatest novelist of the 20th century, and Paul Gauguin (1848–1903), now recognized as one of the greatest Postimpressionists.

And what drives such people to give so much to their chosen endeavors? Some would argue it is the intrinsic satisfaction of their work or the pursuit of truth or beauty. The new economics would suggest that incentives matter and assume that we do better under explicit or implicit compensation that rewards merit or results. In addition to money, the broader new economic view of incentives may include honor, obligation, reciprocity, religion, family, friendship, altruism, teamwork, and other motivators.

Such a variety of intrinsic and extrinsic motivators may apply in various intensities, depending on the person and setting. Though plausible, such motivators seem poorly understood and unreliably measured because investigators must usually rely on self-reports of people who may not assuredly know what really drives them.

Motivators and incentives, moreover, may change unpredictably. As in financial investments, which bear risks of unpredictable changes in preferences, styles in fields of accomplishment may change, which affects the value of social and human capital invested in them. Skilled trial advocacy today is as valuable as it was a century ago, but the styles of contemporary music change rapidly. The classic profession of law appears more stable than artistic pursuits. For these reasons, pursuing productive giftedness in various fields may vary from a wild speculation to a blue chip investment.

VALUE OF LONG-TERM INVESTMENT

Some children begin school with a “comparative advantage.” Their parents may transfer to them not only the advantages of wealth, but of genes and stimulating environments. Musically talented parents, for example, may transfer genetic potential, provide models, and enrich the child’s musical environment. Children with greater endowments, advantages, and acquired skills may have much greater continuing opportunities during childhood and over a lifetime than others, even from the same school and neighborhood.

Such “Matthew effects” are cumulative advantages that characterize human capital investments throughout a period of time (Walberg & Tsai,
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1983). The amount invested in a person in a given period is statistically proportional to that already invested: “To him that hath,” according to Matthew in the Bible, “shall be given, and he shall have abundance.” In productive giftedness, precociousness naturally draws parental encouragement and attracts superior coaches and teachers. The early years may be critical, not only in initially developing giftedness, but in allowing more time for giftedness to bear fruit, which is analogous to the principle of compound interest that means that even small annual returns over a long period yield a huge future value.

Studies of Nobel laureates in science suggest that “the rich getting richer” theory also may apply throughout life (Merton, 1968). There are, for example, huge advantages to starting a scientific career early. The benefits of rigorous high school and university study, early undergraduate or perhaps even high school exposure and work with eminent scientists, publishing early, and initial job placement multiply over time to produce highly skewed productivity in scientific work. A combination of such rare circumstances and individual giftedness results in as few as a tenth of scientists producing nine-tenths of the important, highly cited work. Similarly, distinguished faculty and students, grants, intellectual contacts, and other factors lead to continuing and often increasing distinction of institutions over long periods of time.

What Matthew effects accomplish in essence may be an early investment from sustained, concentrated efforts. In the following sections, the research of Simon, Campbell, Sternberg, Bloom, and Walberg is cited to explain the psychology of such sustained efforts and their consequences.

PSYCHOLOGICAL EXPLANATIONS OF PRODUCTIVE GIFTEDNESS

Human Information Processing

Simon’s (1954) “Berlitz model” is an example of acquiring and processing special knowledge over time. The model involves learning a second language, one of the more difficult adult tasks that demand considerable time, effort, and concentrated attention involved in practice. More practice, however, makes the language easier. Ease increases pleasantness and pleasantness increases practice. Excessive difficulty may slow practice because it is unpleasant; but if learners persevere through difficulty, learning is likely to again become pleasant, and further practice leads to mastery.

Simon (1981), Sternberg and Davidson (1985), and others have shown the same fundamental thought processes appear to be required in both elementary and advanced learning, although their stores of knowledge and the speeds of problem solving differ. The major constraints on acquiring knowledge and skill are the few items of information that can be processed and the 5 to 10 seconds it may require to store an item in long-term memory.
Experts have stored huge amounts of information in permanent memory for ready access and efficient processing. They have indexed information in many ways and can bring it rapidly to conscious memory, even if some of the index links are broken.

Even children differ greatly in their stores of information and rates of accessing it, which enables some children to acquire and process new information more quickly than others. As Sternberg and Davidson (1985) report, “Precocious children form connections at a much more rapid rate than ordinary children, and exceptional adults have formed exceptionally large numbers of variegated stimulus–response connections” (p. 44).

The greatest advantage of the expert and obstacle for the novice is chunking – clustering abstract elements of knowledge. Simon (1981) estimates that 50,000 chunks may be required for the expert mastery of a special field (i.e., about the same magnitude as the recognition vocabulary of college-educated readers). The highest achievements in various disciplines may require a memory of 1 million chunks, which may take even the talented about 70 hours of concentrated effort per week for a decade, although Mozart and Bobbie Fisher were seven- to nine-year exceptions.

Even so, even the most eminent masters might have been able to acquire and process much more had circumstances been ideally productive, for example, all the youngster’s attention and time were concentrated on one endeavor. According to Simon (1981), about 200 million items could be stored in a lifetime. “Hence, the problem for the human being is to allocate his very limited processing capacity among several functions of noticing, storing, and indexing on the input side, and retrieving, reorganizing, and controlling...on the output side” (p. 167).

**Problem Solving**

Sir Isaac Newton (1777–1855) was once asked how he managed to surpass the discoveries of his predecessors; he replied, “By always thinking about them” (Fenn, N.R. [Ct]). Gauss (1643–1727) said, “If others would but reflect on mathematical truths as deeply and continuously as I have, they would make my discoveries” (http://en.thinkexist.com/quotation/if_others_would_but_reflect_on_mathematical_/181371.html).

Both Newton and Gauss knew what it would take to discover profound truths – practice, persistence, and thoughtful perseverance. Although discovery may occur in a split second, it usually requires a decade of preparation and commitment in a specialized field. Newton and Gauss are examples of gifted individuals who, through opportunity, concentrated efforts, and perseverance became eminent in their fields. Claude Monet (1840–1926) and Pablo Picasso (1891–1973) may have surpassed nearly all modern visual artists in the totality and versatility of their work, partly because they continued painting throughout their long lives.
Concentrated efforts involve creative problem finding and solving – the trial and error search for innovative and practical solutions of stored and externally found elements. For experts, items are elaborately associated with one another to facilitate in trial-and-error problem solving. According to Campbell (1960), trial and error suffices to explain creative thought as well as other mental processes. Blind-variation-and-selective-retention processes are “fundamental to all inductive achievements, to all genuine increases in knowledge, to all increases in fit of system to environment” (p. 380). “For this reason, three conditions for creativity are necessary: a mechanism for introducing variation, a consistent selection process, and a mechanism for preserving and reproducing the selected variations” (p. 381).

Similarly, according to Sternberg and Davidson (1985), “individuals may be gifted in cognitive functioning of the kinds measured by conventional tests; contextual fitting that requires adaptation to, selection of, or shaping of environments; and the ability to deal with novelty or to automatize information processing effectively” (p. 42). Our point about these psychological conceptions is that notable accomplishments require large investments of the individual’s time and concentration. Also crucial is the “social capital” of parents, coaches, and teachers as well as the means and media that may be required in various fields.

WHAT MAKES GIFTEDNESS PRODUCTIVE?

Productive giftedness implies both value and scarcity. To bear maximum fruit, a child’s or an adult’s giftedness must be nurtured by multiple causes over multiple time periods. Any one of these causes and time periods may be necessary but insufficient by itself. Rather, it seems that sustained application of the necessary causes seems crucial for eminence or the highest levels of accomplishment.

Loehle (1994) suggests that individual scientific discoveries are multiplicative products of cumulative events. For example, suppose a scientific discovery requires 20 necessary steps, such as asking the right question, setting forth a researchable hypothesis, gaining financial support for the research, developing a detailed research plan, hiring capable assistants, supervising them, collecting data, analyzing it, drawing graphs, drafting a paper, submitting it to a scientific journal, and so on. Even if each step has an easy 90 percent probability of success, the multiplicative product \((0.9 \times 0.9 \times 0.9 \ldots)\) or probability of project completion is only 12 percent. This poor overall success rate explains why many scientists rarely or never publish articles and why productive giftedness or eminence is rare.

As applied to childhood development of eminence, the causes appear more general, but no less crucial. Bloom (1985) conducted research on how giftedness or extraordinary talent is developed among concert
pianists, sculptors, research mathematicians, research neurologists, Olympic swimmers, and tennis champions. His study examined the roles of teachers, parents, and out-of-school personnel in the developmental process. One of the findings of these studies was that once parents became aware of their child’s exceptional talent, they took a more active role in developing that talent. In many cases, parents employed special out-of-school coaches, teachers, programs, and institutions to maximize their children’s early giftedness. Of course, the specific means vary from field to field, but the general factors—discussed in a subsequent section—such as parental encouragement, appear similar.

Those who excel earlier tend to excel later because their earlier and later social environments tend to give them similar advantages. A child musically stimulated at age 2 is more likely than others to be further stimulated as an adolescent. Early environments, particularly parental stimulation, predict later environments, and both have an impact on learning and the degree of later accomplishment. Early influences provide a background of early achievement, which increases the rate of progress. With some exceptions, eminent adults tend to work diligently, choose their goals carefully, and once committed, complete difficult tasks.

The word “workaholic,” with its pejorative overtones, is only a recent invention. Accomplished individuals, in any case, are exceedingly well organized—hard workers who often routinize or leave to others time-consuming tasks that contribute little to their accomplishment. One clear example is Thomas Jefferson, who, along with scientist/inventor/artist Leonardo da Vinci, was one of the few people in history who was eminent and highly accomplished in more than one field. An active plantation farmer, architect, ambassador to France, and president of the United States two-time, he conducted world-class research on agronomy and botany and wrote books, pamphlets, and tens of thousands of letters on a variety of subjects.

At his Monticello home, Jefferson set his bed in an alcove between two rooms, which enabled him to rise in either room. “A typical day for Jefferson started early, because, in his own words, ‘Whether I retire to bed early or late, I rise with the sun.’ He told of a 50-year period in which the sun had never caught him in bed; he rose as soon as he could read the hands of the clock kept directly opposite his bed.”

In his pockets, Jefferson carried scales, drawing instruments, a thermometer, a surveying compass, and a level. To record his observations, he carried a forerunner of today’s personal digital assistant, a bound set of small, reusable ivory note pages for penciling observations that could later be transferred to permanent ink records.

Jefferson invented ingenious time-savers, such as a manuscript copying mechanism, a desk stand that could rotate any one of several projects to his attention, and the equivalent of a modern database of letters organized by correspondent and date, any one of which could be sent...
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### TABLE 22.1. Three Sets of Nine Productivity Factors

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<th>Set</th>
<th>Factors</th>
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<td>Aptitude includes:</td>
<td>(1) ability or prior achievement, as measured on the usual standardized tests; (2) development, as indexed by age or stage of development; and (3) motivation or self-concept, as indexed by personality tests or willingness to persevere on learning tasks.</td>
</tr>
<tr>
<td>Instruction includes:</td>
<td>(4) the amount of time students engage in classroom learning and (5) the quality of the instructional experience including both its psychological and curricular aspects.</td>
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<tr>
<td>Psychological environment bear on learning are:</td>
<td>(6) the curriculum or academic environment of the home; (7) the social climate of the classroom group; (8) the peer group outside school; and (9) (negative) exposure to mass media, notably, television.</td>
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for while abroad. For other instances of Jefferson’s concentration, habits, and work aids see, for example, http://www.monticello.org/jefferson/dayinlife/sunrise/home.html. Wouldn’t it be fascinating to find out and compile such personal predilections of Aristotle, Mother Teresa, and other productively gifted people of ancient and modern times?

Enhancing Educational Productivity

Though a necessary determinant of productive giftedness, hard work alone can hardly be the only cause. Psychologists have long been interested in identifying the factors that promote academic and other learning in general and among gifted students in particular. The following paragraphs explain a nine-factor theory of educational productivity and review research that indicates how academic learning can be enhanced and giftedness can be made productive by educational and psychological means. Several thousand comparisons show that the amount and quality of instruction and stimulation in classrooms, homes, peer groups, and mass media have consistent and powerful effects on learning (Walberg, 1984a). When taken as a whole, the factors that promote learning can be increased, which promotes a disciplined mastery of a general or specialized field. Research syntheses (or “meta-analyses”) of many studies of the nine factors show that learning can be made far more productive. Quantitative estimates of the effects show the factors to be potent, consistent, and widely generalizable. These nine factors fall into three groups shown in Table 22.1. Specific aspects of the factors and the magnitude of their effects are specified elsewhere (Walberg, 1984a) and are illustrated in a subsequent section of this chapter.
Research consistently shows that the home and school can serve as places of continual stimulation and encouragement for a child. For reasons of first learning and quantity of time alone, the home is foundational and of continuous importance; about 92 percent of children’s time in the first 18 years of life is under the responsibility of parents, and only 8 percent is spent in school (Walberg, 1984a). Home influences include informed parent–child conversations about school and everyday events; encouragement and discussion of leisure reading; monitoring and talking about television and peer activities; deferral of immediate gratifications to accomplish long-term human capital goals; and providing a warm, nurturing environment where the child’s basic needs are met and ideas and habits may be constructively challenged.

The nine-factor productivity model posits that factors can be adjusted and, when optimized, can be powerful. For example, in the classroom, specific methods of teaching and certain new programs in schools may be more effective than others (i.e., mastery learning, cooperative learning, and adaptive education). To teach habits associated with hard work, parents and teachers can provide supportive environments. Parents should be invested in their child’s education, and teachers can offer demanding courses, assign reasonable amounts of well-designed homework, and provide incentives to stimulate and reward hard work.

**PRODUCTIVE GIFTEDNESS AMONG HISTORICAL FIGURES**

The nine factors found to promote academic learning have also proven helpful in studying the lives of accomplished adolescents and the childhoods of eminent men and women of history. This section provides an overview of common childhood traits and learning environments, which may be useful in designing experiences and programs for all students, including the gifted.

**Eminent Men**

Walberg (1981) and 76 other scholars studied the leading biographies of more than 200 eminent men born between the 14th and 20th centuries, including Bacon, Beethoven, da Vinci, Darwin, Dickens, Goethe, Lincoln, Milton, Napoleon, Newton, Rembrandt, Voltaire, and Washington. We rated their childhood characteristics and environments through age 13. The sample traces back to the turn-of-the-century work of James McKean Cattell, founder of the biographical volumes called *American Men and Women of Science*. In 1903, Cattell listed in rank order 1,000 eminent men according to the number of words that had been written about each in American, English, French, and German biographical dictionaries.

Statistical analysis of our ratings revealed the prevalence of intellectual competence and motivation, social and communication skills, general
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psychological wholesomeness, and both versatility and perseverance during childhood. Cultural stimuli, materials related to their field of eminence, teachers, parents, and other adults were clearly indicated for most eminent individuals. Most of the men had clear parental expectations for their conduct, but they also had the opportunity for exploration on their own.

The most distinctive rating of all the childhood traits was estimated intelligence, which was rated superior for 97 percent of the sampled men. The brightest, however, were not necessarily the most eminent. Character traits and early environments also counted. Research on contemporary adolescents and adults suggests that only a minimal level of measured intelligence may be necessary as one of the several factors predictive of success. Without sufficient opportunities, intelligence and motivation may count for little.

Stimulating family, educational, and cultural conditions during childhood were strong indicators of later eminence. Seventy percent of the men had clear parental expectations; but nearly 9 out of 10 were permitted to explore their environments on their own. A little more than half were encouraged by parents, and the majority was encouraged by teachers and other adults. Many were exposed to eminent adults at an early age. More than a majority were successful in school and liked it, and less than a quarter had school problems. The majority of men also showed a large number of distinctive affective traits that collectively suggest psychological wholesomeness. Being ethical, sensitive, solid, magnetic, optimistic, and popular were common traits. About a quarter to a third of the sample, however, showed introversion, neuroses, and physical sickliness. Only 38 percent were rated tall, but the majority were handsome and possessed vitality.

As we pointed out in our initial studies, the biographical accounts undoubtedly contained cultural and historical bias, and our ratings may have been additionally prejudiced by our own times and predilections. What may have been conducive for eminence in past centuries may no longer apply.

Even in the sample, there were outstanding exceptions to what may seem inevitable causes of eminence: Consider Lincoln, perhaps one of our two or three greatest presidents. He had to help his illiterate parents in Illinois fields and had little time for his tiny, one-room school. Still, his family moved from Kentucky to Illinois because of his father’s ardent abolitionist beliefs, which may have given Lincoln the will to face the Civil War. In any case, whatever biases and exceptions in drawing inferences from biographies, it is fascinating to read about the traits and early environments of unquestionably eminent contributors to Western civilization and to reflect on what may have been the reasons for their accomplishments. (Hearing stories and reading about them may serve to inspire gifted children and adolescents; it may also inform them of sacrifices others have made to achieve productive giftedness.)
Eminent Women

Sicherman and Green’s (1980) careful and exhaustive work with many scholars to objectively identify eminent American women of the 20th century made it possible for us to extend our work with a similar biographical rating form. The women included skater Sonja Henie, actress Ethel Barrymore, singer Mahalia Jackson, athlete Babe Didrikson Zaharias, businesswoman Helena Rubinstein, blind and deaf leader Helen Keller, poet Marianne Moore, painter Grandma Moses, reformer Margaret Sanger, educator and civil rights leader Mary McLeod Bethune, scientist Rachel Carson, suffragist Jeannette Rankin, and political leader Eleanor Roosevelt.

Referencing from one to six biographies, we rated the early traits, conditions, and experiences through age 13 of each of the 256 eminent women.

The most common psychological trait of eminent women during childhood was the same as the previous study on men – intelligence. More than half of the women showed high intelligence in their early years. The other top-ranking traits for both men and women were perseverance and hard work, especially in music and the visual arts.

The eminent women shared a number of traits in their childhoods that can be divided into four categories:

1. force of character – strong willed, vital, confident, adventurous, single-minded, challenging, emotionally secure, energetic, and joyful in work;
2. independence – imaginative, creative, original, well traveled, alert to novelty, inquisitive, and questioning of conventions;
3. intellectual competence – precocious, knowledgeable, well informed, versatile, and broad interests; and
4. academic propensity – bookish, well read, scholarly, skillful in writing, and positive school attitudes.

One third to half of the women were directly taught or strongly encouraged by fathers, mothers, or other adults. Three in 10 girls had clear parental expectations, yet nearly a fourth were allowed to explore on their own. Forty-six percent came from financially advantaged families, though more than half came from culturally advantaged families. More than a third were exposed to cultural materials and stimulation, which may or may not have been related to their current fields.

PRODUCTIVE GIFTEDNESS AMONG ADOLESCENTS

Are such early traits and conditions also associated with productive giftedness of 20th century adolescents? We carried out two studies to answer this question.
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Artists and Scientists

From a large, random national sample of high school youngsters, we identified those gifted in science and the arts (Walberg, 1969a). Those defined as gifted in science had won science contests. Artistic accomplishment was similarly identified; writers, for example, had their work published in a newspaper or magazine. We asked gifted and other students 300 questions about their motives, abilities, circumstances, and attitudes toward school and life. We analyzed their answers to find out how the scientifically and artistically accomplished adolescents differed from one another and from other students in their classes.

Both scientists and artists described themselves as friendly, outgoing, and self-confident, but they were more likely to find books more interesting than people. Both groups were interested in mechanical and scientific objects and the arts. Bookish, they liked to read outside of school, especially professional and technical books. They enjoyed visiting libraries and had numerous books at home. They liked school and worked harder and faster than their peers. They were also interested in finely detailed work and were persistent in finishing their tasks.

Both groups were interested in and confident of their own creativity and intelligence. Both groups were also ambitious and set high values on their future education and salary. Even so, the scientists and artists chose creativity more often than did others in identifying the best characteristic to develop in life and less often chose wealth and power.

How did the groups differ from one another? Scientists seemed preoccupied with things and ideas rather than people and feelings. They had more difficulty relating to others and may have avoided intense emotional closeness. Scientists were task-oriented and persisted through difficult tasks, and were attracted to academic work and detail. Scientists were more interested in presenting truth than portraying the aesthetic value of the project. Scientists dated less and were more bookish.

Scientists expressed more confidence in their own intelligence, whereas the artists felt this way about their creativity. More than artists, scientists tended to favor “security” as the best characteristic of a job. Artists were preoccupied with communication of inner feelings, whereas scientists were more singleminded and determined in conceptualizing external reality. In contrast to the group winning no awards in science or the arts, artists and scientists appeared wholesome and ambitious.

Gifted Adolescents

As a follow-up to the previous study, we drew another national random sample to study the traits and conditions of gifted adolescents, including school leaders who had held a significant class office or other position in
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the school or community (Walberg, 1971). Corroborating others’ previous studies, the study showed conventional intelligence measures were very weakly related to giftedness. The gifted students in science, artistic fields, and leadership, nonetheless, were different from those who did not achieve distinction. The gifted groups thought they were more creative and imaginative. Most liked school and received good grades, but questioned their teachers more often than others. They thought that it was important to be intelligent, studied and read outside of school, had numerous books at home, and inquired of adults about occupations. They were also able to persist through difficult tasks.

In contrast to scientists, artists characteristically had more diversified, less concentrated interests and opportunities. Artists, particularly musicians and theatrical performers, had more opportunities outside of school than in school and were less persistent in their studies. In summary, though all gifted groups were more actively involved in school than other students, scientists and group leaders tended to be more involved in academic life than did performers and musicians. The findings show that accomplished groups in different fields resemble one another more than they resemble students who are not as accomplished or have not won any awards or distinction.

CONCLUSION

Our studies lead us to think that productive giftedness is best indicated by present accomplishment, sometimes even in childhood. Though exceptions can be noted, excellent second-grade readers are more likely than others to become editors of a school or college newspaper and possibly even eminent writers in adulthood. A high school student who completes Advanced Placement courses in calculus, biology, chemistry, and physics is far more likely than others to become an outstanding physician or scientist. Even the visual and performing arts have very few eminent “late bloomers.” American folk artist Grandma Moses (1860–1961), who began painting in her 70s, is such an exception (perhaps in part because of her three-decade career).

Economic theory, research on the nine factors shown in Table 22.1, the biographies of eminent men and women, and studies of outstanding adolescents suggest to us that early childhood and adolescent traits and psychological conditions are far more important than conventionally measured intelligence in productive giftedness. The traits include will power, perseverance through difficulties, sufficient independence to originate and sustain new ideas despite others’ objections, and deep knowledge and mastery of a specialized field. Gifted students, particularly in science and other academic subjects, tend to be bookish and successful in school.

Of course, many exceptions can be noted. Usually focused on the arts and sciences, for example, few studies have been made of the childhoods of
attorneys, business people, and politicians – even though they are no less important in American society. Sayings about their preparation, however, offer telling caveats about what might be concluded about the possible linkages of preparatory academic success and adult success. In business, it is said with a grain of insight – or salt – that the “A” students become professors, and “B” students work for “C” students.

Finally, as illustrated in our previous works and better in the biographies we relied on, we point with respect to the huge importance of parents, teachers, coaches, and others who encourage productive giftedness. They encourage. They inform. And they provide resources, advantages, and opportunities.

References


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