Giftedness: Current Theory and Research

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Abstract

Gifted children, those with unusually high ability in one or more domains, not only develop more rapidly than typical children, but also appear to be qualitatively different. They have an intense drive to master, require little explicit tuition, and, if intellectually gifted, often pose deep philosophical questions. Although some psychologists have tried to account for the achievements of gifted individuals solely in terms of drive or "deliberate practice," no evidence allows us to rule out innate differences in talent. Profiles of gifted individuals are often uneven: Extremely high ability in one area can coexist with ordinary or even subnormal ability in another area. Scientific investigation of the gifted reveals the importance of drive and hard work in achievement of any kind, and the lack of necessary correlation among abilities in different areas.

Keywords

gifted; drive; innate; talent; savant

While mainstream psychology has sought to understand the universal in human mental processes, a respectable complementary tradition has investigated individual differences and the atypical. Like the study of retardation, psychopathology, and emotional disorders, research on the gifted belongs to the latter tradition. Psychologists have studied such populations not only in order to understand them on their own terms, but also in the hope that an understanding of the atypical may shed light on the typical.

Systematic study of the gifted began in the 1920s with Terman's (1925) longitudinal study of 1,528 children with IQs averaging 151. These children were surprisingly well rounded and socially well adjusted, and grew up to be successful professionals. However, none made widely recognized intellectual breakthroughs. Thus, even extraordinarily high IQs do not by themselves lead to creative eminence. Whether such IQs predict even professional success could not be determined because Terman did not control for possible effects of socioeconomic background.

Since Terman's time, there has developed a consensus that giftedness is often not captured by the unidimensional measure of IQ. Some researchers have differentiated mathematical and verbal giftedness and have shown how domain-specific tests (math and verbal Scholastic Assessment Tests) are more accurate than IQ tests in distinguishing such gifts (Stanley, 1973). Some have broadened giftedness to include high ability in any area, including music, spatial reasoning, and interpersonal understanding (Gardner, 1993). The case has also been made that intellectual giftedness is more than high ability, and should include creativity and motivation (Renzulli, 1978). Our understanding of giftedness is most likely to advance if we define giftedness simply as unusually high ability in any area (including domain-specific ability as well as high global IQ), and then proceed to investigate the correlates (e.g., drive, creativity) and developmental path of each type of high ability.

ARE GIFTED INDIVIDUALS QUALITATIVELY OR QUANTITATIVELY DIFFERENT?

Perhaps the most basic question about giftedness is its relationship to the typical. Do gifted individuals stand out chiefly in terms of the speed with which their abilities develop and with which they process information? Or do they develop and process information in a way that is qualitatively different from normal?

Strong claims have been made about qualitatively different modes of thinking in high-IQ children, but the evidence remains anecdotal. According to clinical observations, high-IQ children consider many possible interpretations of a question, grasp the essential elements of a complex problem, and often pose deep philosophical questions (Lovecky, 1994). Controlled studies are required to determine whether these observations are true of gifted children in general, only those with high IQs, or perhaps only a subset of IQ-gifted children (e.g., only those above a certain level of IQ, verbally but not mathematically gifted). These studies must compare gifted children with peers matched for mental age so that the effects of ability level and giftedness can be disentangled.

Gifted children also appear to be qualitatively different from ordinary children in motivation, but again the evidence remains anec-

dotal. The gifted children who come to the attention of teachers and parents display an intense drive, or "rage to master." They work for hours with no parental prodding or external reinforcement. As they work, they pose challenges for themselves. Such children also differ from ordinary children in the way they learn. They make discoveries on their own, and much of the time they appear to teach themselves. But we do not know how many children have high ability but low motivation to demonstrate that ability (or high motivation in an area in which they do not have high ability) and who thus do not come to our attention as gifted. Again, controlled studies are needed to compare gifted children with older children who have similar levels (but in their case, age-typical levels) of ability.

The strong drive that accompanies giftedness, the posing of challenges, the mastery orientation, and the ability to make discoveries independently together suggest that gifted children do not just develop more rapidly than others, but develop and think differently from others. But there is a clear need for systematic research so that we can move beyond anecdotal evidence and determine whether high ability is always accompanied by such qualitative cognitive and motivational differences.

THE ROLE OF INNATE TALENT

Giftedness provides an ideal arena in which to investigate the relation between inborn talent and learning (Simonton, 1999). According to the layperson's view, gifted children are endowed with innate talents that make themselves known from a very early age, a view echoed by researchers whose focus is giftedness and who publish in journals devoted to the study of gifted children (typically IQ-gifted children). A contrasting environmental view has emerged among psychologists who identify their focus as the study of talent or expertise.

The evidence for the nurture position rests on retrospective studies of eminent individuals. An early study revealed the importance of drive as separate from ability. Roe (1952) showed that scientists who achieve the highest levels differ from their less eminent colleagues not in intellectual ability but in capacity for concentration and hard work. However, because all of Roe's scientists had high ability, this study tells us nothing about what one can accomplish with low inborn ability along with a strong drive to work.

The importance of a supportive environment and intensive training was demonstrated by Bloom (1985), who found that individuals of world-class status in the arts, mathematics, science, or athletics all reported strong family support and years of training. However, such a finding hardly rules out innate talent: Bloom's subjects also recalled signs of high ability at a very young age, prior to or at the very start of formal training. These memories of early signs of high ability are consistent with parental accounts of child prodigies whose extraordinary abilities seem to emerge from nowhere.

Most recently, studies have revealed the necessity of "deliberate practice"—effortful work designed to improve performance. Ericsson, Krampe, and Tesch-Romer (1993) demonstrated that level of achievement in piano, violin, ballet, chess, bridge, and athletics is predicted by sheer amount of deliberate practice. For example, the best musicians in this study had engaged in twice as many hours of deliberate practice over their lives as had the least successful ones. However, children who work the earliest and hardest may well be those with the highest levels of talent. Most children cannot be cajoled to play music or think about math problems for hours on end, but highly gifted children often cannot be cajoled away from such activities. Amount of deliberate practice is thus likely to be a function of drive and interest, temperamental factors associated with talent. That is, children with high ability in a given area are likely to have a high drive to master that area.

As pointed out by Schneider (in press), Ericsson and his colleagues never measured ability levels, and thus there is no way to rule out ability differences among individuals of unequal levels of eminence. Independent assessments of the predictive power of ability and deliberate practice have shown that both are important (Schneider, in press). Simonton (1991) showed that the most eminent classical composers began to compose and made lasting contributions after fewer years of formal training than their less eminent peers. The fact that they achieved greater heights with less practice suggests that their success reflected another ingredient besides practice—and a likely candidate is a higher level of inborn musical talent.

Despite attempts to account for giftedness in terms of nurture, no evidence allows us to rule out the necessity of an innate component. Simonton (1999) proposed a model of innate talent that is multidimensional and dynamic. He argued that achievement in any domain requires various innate components, with some domains requiring far more than others; components develop independently over time; level of ability is determined by a multiplicative composite of these components; and giftedness is emergenic (i.e., it manifests itself only when all of the required com-

ponents are inherited). This model can account for many of the complexities of giftedness, including the rarity of giftedness particularly in complex domains (because if only one component skill in a domain is assigned a weight of zero, the individual cannot be gifted in that domain). Of course, granting a role to nature does not rule out nurture. Whether nature or nurture accounts for more of the variance in giftedness remains to be determined, and the answer to this question is likely to differ across different domains of giftedness (Simonton, 1999).

HOW UNEVEN ARE THE COGNITIVE PROFILES OF GIFTED INDIVIDUALS?

If the components of giftedness within a given domain develop independently of one another, the profiles of individuals gifted in that domain should be uneven. There is some evidence for this. Adults with high IQs show lower correlations among subtests of the IQ than do those with ordinary IQs (Detterman & Daniel, 1989). In addition, the cognitive profiles of academically gifted children are often quite uneven, with mathematical ability far outstripping verbal ability, or the reverse (Benbow & Minor, 1990). Research is needed to determine how common such uneven profiles are among the gifted, and how common it is to have gifts accompanied by absolute rather than relative weaknesses.

Just as uneven profiles often characterize the abilities of high-IQ individuals, uneven profiles also characterize individuals gifted in music or art, who may have a strong gift in the presence of an unremarkable IQ. For example, Simonton (1999) noted that Beethoven had almost no mathematical ability; nor was he particularly strong verbally. And Csikszentmihalyi, Rathunde, and Whalen (1993) found that the artistically gifted adolescents they studied had poor academic skills.

In the case of savants, who present the most striking cases of unevenness, an extreme ability coexists with a subnormal IQ. Savants are retarded, autistic, or both, yet exhibit a strong gift in a particular domain (typically music, visual art, or numerical calculation). They have often been dismissed as mere imitators whose abilities are irrelevant to an understanding of giftedness in nonsavants. However, savants show an implicit understanding of the rules of their domain, revealing that they are not rote imitators. In addition, the drawings and musical works they produce can be expressive and have artistic merit. Because savant gifts are similar to nonsavant gifts in important respects, savants provide strong evidence that general intelligence, or what psychologists often call *g*, is unrelated to high levels of achievement in some domains.

UNANSWERED QUESTIONS

An understanding of what constitutes giftedness shows the importance of drive and hard work in achievement of any kind, and reveals that high abilities in some domains do not require a high IQ. A fundamental question not yet resolved is whether gifted children differ from average ones only in a quantitative way, or whether they differ qualitatively, in which case new principles are required to account for their performance. Several other perplexing questions that open the door to intriguing new lines of research include whether the heritability of gifts differs across domains, whether the role of practice and its interaction with innate talent differ across domains, what forms of early prodigiousness do and do not predict creative eminence in adulthood, and whether brain imaging can demonstrate similarities in the brain organization and functioning of savant and nonsavant gifted individuals working in the same domain.

Answers to some of these questions also have educational implications. The question of how gifted children should be educated (most often asked about the intellectually gifted) is of enormous practical importance. These children benefit cognitively and socially from ability grouping and acceleration (including early entrance to college programs; Janos, Robinson, & Lunneborg, 1989). Research on the long-term cognitive and social outcomes of these methods should continue, and policy should follow from research findings rather than ideological positions.

Recommended Reading

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Note

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