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## Giftedness and gifted education: the need for a paradigm change

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# **Giftedness and gifted education: The need for a paradigm change**

Albert Ziegler, Heidrun Stoeger, & Wilma Vialle

At about the same time as systematic research into giftedness was established in 1900, one of the most ingenious mathematicians of all time, David Hilbert, published a list of 23 unsolved mathematical problems. These open-ended problems later became famous as Hilbert's problems and a number remain unsolved today. Hilbert's intention in publishing these problems was to spur on the further development of mathematics. Undoubtedly he succeeded in his endeavor as the problems he outlined set the agenda for much of the mathematical work of the late nineteenth and early twentieth centuries. In so doing, he shifted the course of mathematics and, thus, he is regarded as one of the most influential mathematicians of his time (Browder, 1976).

In a similar vein, Subotnik, Olszewski-Kubilius, and Worrell (2011) have undertaken their paper with the intention of shifting the course of research in giftedness. Their call to rethink giftedness and gifted education targets all those already involved in gifted education, from teachers to policy-makers and, indeed, to researchers as well. As a group of researchers engaged in this field of endeavor, we welcome the authors' paper and join in their call to action. Over the course of the last decade or so, there have been growing signs that gifted education and giftedness research have entered a phase of crisis. Indeed, in an upcoming target article in the journal, *High Ability Studies*, the authors argued the urgent need to develop new paradigms in gifted education and its associated research (Ziegler & Phillipson, in press). A clear majority of the commentaries in response to Ziegler and Phillipson's article were in agreement with their evaluation.

Therefore, in this commentary our intention is to supplement Subotnik et al.'s pivotal paper. First, we will adopt a self-critical examination of the current standing of giftedness research within the scientific community. Secondly, we will sharpen the authors' critique of gifted education in three respects. Finally, we will propose four necessary and productive lines for future research.

**Giftedness research put to test: Researchers' self-critical remarks**

By linking giftedness to learning and eminence<sup>1</sup>, Subotnik and her colleagues increase the prolific potential of giftedness research enormously. Indeed, giftedness research that adopted a learning and eminence orientation could well serve as psychology's *Drosophila* for the study of successful and effective learning processes. This would be a welcome shift, given the current outcomes of much of our giftedness research. We draw attention to three pieces of evidence to support this idea.

First, a glimpse into the last couple of issues of the major giftedness journals in the field (e.g., *Gifted Child Quarterly*, *Talent Development & Excellence*, *High Ability Studies*, *Journal for the Education of the Gifted*, *Roeper Review*, and, *Gifted Education International*) reveals the disturbing fact that the major variables or concepts under investigation have usually been published more than 30 years ago, indicating a long process until the concepts of general education and psychology trickle down into giftedness research.

Secondly, for a long time research papers on giftedness have not made it into the top mainstream educational and psychological journals with high impact factors. Furthermore, empirical papers on giftedness or papers from the leading giftedness journals are very rarely quoted in those high impact journals.

Thirdly, even our neighboring scientific disciplines do not seem to value the results of giftedness research. For example, in their respective reference handbooks, the concept of giftedness is actively rejected by almost all of the expertise researchers (Ericsson, Charness, Feltovich, & Hoffman, 2006) and simply ignored by the innovation researchers (Shavinina, 2003). We should ask why the work of giftedness researchers does not contribute to the work of researchers specializing in the study of expertise or innovations. Moreover, giftedness researchers should also contemplate why the researchers from these two neighboring research fields are able to publish their papers in the educational and psychological journals with the highest impact factors.

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<sup>1</sup> Linking giftedness with eminence by no means implies that eminence must or should be the ultimate educational goal for each gifted person. However, it is — by definition of the very term of giftedness — always an option and society should provide for the proper support that a gifted person is able — provided s/he so wishes — to attain this goal.

## **Gifted education: Extending the authors' reasoning**

Subotnik et al.'s original paper highlights three topics: reliability of gifted identification; the effectiveness of gifted education; and, the credentials of gifted education. We concur with the authors for the most part, however, we believe the situation might be even more dramatic.

*Reliability of gifted education:* Despite more than 100 years of research, we are still far away from being able to reliably identify later eminent individuals. Subotnik et al. point rightly to some spectacular failures to include individuals, who later prove to be outstanding, in research samples. Our obvious inability to correctly identify is certainly one of the main reasons that expertise researchers reject our identification methods. And we have to admit that since the beginning of giftedness research our identification approach has changed only surprisingly little. For example, gifted identification is still selection-oriented and, thereby, targets individuals instead of identifying learning pathways (to eminence).

*Effectiveness of gifted education:* There are sound and clear-cut criteria to determine whether an educational method can be labeled as effective (e.g., Cohen, 1988). However, when publication bias (e.g., Dickersin, 1990) and placebo effects (e.g. Orne, 1973) are taken into account, the effect sizes of practices in gifted education typically turn out to be weak (Lipsey & Wilson, 1993). Even worse, there is also evidence that gifted education can have unintended side effects. For example, labeling a child as gifted puts her or him at risk (e.g., Freeman, 2006). Thus it comes as no surprise that none of the 25 commentators of the aforementioned upcoming target article has disputed the authors' central claim that methods in gifted education are usually ineffective (Ziegler & Phillipson, in press).<sup>2</sup> But even if gifted educational methods were effective according to conventional criteria that would not help greatly. Subotnik et al. argue that giftedness should be linked to eminence. This means we have to search for educational methods that are at least 15 to 20 times stronger than our most effective educational methods today. This might be possible, but it would also demand that we allocate extensive educational and learning resources to the individual promotion of those deemed gifted (Ziegler & Baker, in press). This leads to the third topic.

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<sup>2</sup> Due to space limitations and rigorous peer review only 25 commentaries were printed. But, 49 commentaries were submitted. Only one of the 49 commentators objected to the bleak evaluation of gifted education methods.

*Credentials of gifted education:* We assume that most the readers of this commentary would agree with us, and the authors of the target article, that gifted education is a worthwhile objective. However, we have only scattered empirical evidence to support our assumptions. The best data to date were published by Rinderman, Sailer, and Thompson (2009). Their analysis of data from TIMSS, PISA and PIRLS demonstrated that, for a number of outcomes (e.g., GDP, patent rates, numbers of scientists, government effectiveness, political liberty), the “smart fraction” (defined as cognitive ability) of the students at the 95<sup>th</sup> percentile was far more important than the average IQ for the nation. However, this study only gives some initial evidence that investment in the brightest children might pay off. We need further studies conducted by interdisciplinary research teams to prove that gifted education pays off in terms of economic, cultural, and societal progress. At this stage, though, we do not have much more than our intuition and sobering evaluation studies.

### **The future of giftedness (and giftedness research)**

We want to emphasize once again the authors’ fundamental message that we need to focus more on learning (and less on traits) and to link giftedness to eminence (that is, the outcome of successful learning processes). But this also means that in the future, giftedness research needs to be much better connected to the cutting-edge and not to yesterday’s research. We see at least four obstacles that have to be overcome to allow such cutting-edge research to occur.

*Definitional issues.* Many scientific disciplines started with an everyday concept but abandoned it over the course of time, either by giving it up altogether (e.g., phlogiston) or by sharpening its extension and intension (e.g., atom). The authors of the target article readily admit to the considerable problems with current definitions of giftedness, but try to resolve the issue by offering an eclectic definition. Though their definition is a clear step forward, it creates new issues by violating well-established standards for accurate definitions informed by their fields of epistemology and logic (e.g., Burge, 1993; Fetzer, Shatz, & Schlesinger, 1991; Robinson, 1950; Sager, 2000). For example, within their definition giftedness is described in theoretically incompatible and logically contradictory terms as a “manifestation of performance”, a “potential”, an “achievement” and a “label”

(Subotnik et al., 2011, see p. 7). In addition, the developmental nature of giftedness from potential via achievement to eminence is also problematic as it is a “grue-and-bleen”-like concept.<sup>3</sup> To resolve these problems, we would suggest that the two central concepts mentioned by the authors, eminence and learning pathway, could provide the foundation of a definition. We would propose that giftedness should be understood as a *label* granted to individuals for whom we can identify a learning pathway that leads to excellence (see also Ziegler & Vialle, in press). This definition has distinct advantages. It is logically and epistemologically sound, can easily be understood by laypersons, and helps the concept of giftedness to rid itself of its mystical aura.

*Holistic perspective.* Subotnik et al. (2011) limit giftedness to individuals. Though we readily agree that this is acceptable for the label ‘giftedness’, we doubt that it is appropriate for a research focus. Rather, we advocate a holistic rather than an individualistic approach. For example, in order to prove the credentials of gifted education and giftedness research to society, we must also be able to answer questions like:

- What is the probability that the next winner of a gold medal at the Academic Math Olympics will come from China?
- Is it more likely that someone who enrolls in a Bachelor program at an ivy-league university or someone who enrolls in a state university of good reputation will attain eminence (e.g., is awarded a Noble Prize)?
- What is the probability that the 2025 world champion in chess will come from an Arabian country?

Questions like these are obviously beyond the scope of conventional giftedness models that focus on the individual alone. Rather we have to combine the individualistic with a holistic perspective within a *single* theoretical framework. This means, in particular, that it is not enough to pay lip-service to the importance of the environment or to fragment the research field into gifts (talents, abilities, etc.), internal moderators (e.g., high motivation), and external moderators (e.g., mentors), which collude in a simple summative or multiplicative manner. Better suited are models within the ecological or systemic

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<sup>3</sup>*Grue* and *bleen* are artificial colors. For example, an emerald color could be defined as grue when it is green today but changes its color in 2022 to blue. Nelson Goodman pointed out in his seminal book, *Fact, fiction, and forecast*, that many logical problems were caused when concepts change their identity or nature over time (see for example Stalker, 1994).

paradigm like the actiotope model that is particularly prominent in East-Asian countries (Phillipson, Stoeger, Ziegler, in press). The advantages of such integrative frameworks can be easily understood when we consider the role of “chance” on which Subotnik et al. (2011) reflect at length. On the basis of a systemic or ecological approach, eminence is not just a happy coincidence that *can* happen somewhere, but a likely consequence that *has to* happen. So chance is not a concept that has to be theoretically embraced, but is rather a phenomenon that reflects an insufficient understanding and indicates a need for further scientific development.

*Multidisciplinary.* Future giftedness research needs more multidisciplinary for several reasons. First, in order to prove the credentials of gifted education, the help of researchers specializing in the economics of education is required. Additionally, many other sciences might be valuable allies, for example, political sciences, arts, sports science, and so on. Secondly, when we adopt an ecological or a systemic approach, a single disciplinary approach will rarely suffice.

*Obligatory evaluations.* Evaluation studies should be the rule, not the exception. This refers equally to the rigorous evaluation studies of gifted education projects as well as comparative evaluations of our theoretical models.<sup>4</sup>

### **Concluding remark**

In closing this commentary, we want to stress that we emphatically support Subotnik and her colleagues’ call to action. We need new paradigms that compete against conventional giftedness research and against each other. Their common objective should be the identification of learning pathways to eminence, the development of much more effective methods of gifted education and to prove to society that gifted education and giftedness research are worthy of their support. We are sure that in this future orchestra of paradigms, the contribution of Subotnik et al. will have a major voice.

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<sup>4</sup> Less than 1% of our empirical studies are based on randomized assignments to control and treatment conditions in longitudinal pre-post-test designs that test for short-term and also for long-term effects. Moreover, many “evaluations” are based on the satisfaction of participants even though the inadequacy of this type of data is well-known.

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