# Epilogue: Conclusions and Implications for Gifted Education

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*This epilogue draws general conclusions regarding the role of nature and nurture in the development of exceptional competence. Then, implications of the nature-nurture debate and research on gifted education are discussed in terms of 2 alternative paradigms: the gifted-child paradigm and the talent-development paradigm. More specifically, we attempt to elucidate how ideas expressed in preceding articles reinforce a talent-development orientation along 5 major dimensions of gifted education: (a) programming, (b) identification, (c) curriculum, (d) teaching, and (e) counseling.*

## Introduction

The five papers present theoretical exposition and basic research in the development of gifts and talents. They expand the common knowledge of our field. Yet, as fascinating as this information is, the implications for professional practice are often indirect (except for Lohman, this issue, which directly addresses identification issues). This is not a criticism of the papers because they were not written for the purpose of application to practice, and it is unfair to expect them to do that. Indeed, developmental research does not always contextualize itself in educational or other practical contexts, and its findings may not find immediate practical applications (Mönks & Mason, 2000). However, many of our readers define themselves in terms of their professional roles, such as school psychologists, classroom teachers, gifted specialists, counselors, administrators, and professors. Our intent in this concluding part of the special issue is to (a) summarize the gist of arguments put forward by the preceding papers regarding the nature-nurture issue and (b) take five major areas of professional practice (programming, identification, curriculum, teaching, and counseling) and connect them to ideas explicated in these papers.

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*The Nature and Nurture of Giftedness*

Regarding the three issues we have used to frame the discourse on the nature-nurture issue (Dai & Coleman, this issue), the following conclusions seem warranted:

- *Nature Versus Nurture*: Even though the authors disagree on the issue of whether or not nature or nurture plays a predominant role in the development of high-level expertise and creative productivity, even the most staunch champion of heritable "giftedness" would concur that the advantages genetically bestowed upon some children are necessary but not sufficient conditions for the development of exceptional competence. Because it is difficult to alter the genetic makeup, a focus on effective nurturing seems a more productive educational strategy, particularly as we have no veridical knowledge showing that inherited individual differences, however defined, set limits on the development of exceptional competence in a domain of interest. We have no way of knowing whether or not an individual does or does not have potential unless given fair educational opportunity. We expect continuing debates and research on if and to what extent genetic inheritance constrains the development of exceptional competence in a fundamental way—in terms of rate of learning, asymptotic performance, and creative contributions. However, given the apparent inadequate predictive efficacy of psychometric measures of personal traits (the intelligence or personality variety) with respect to long-term developmental outcomes and real-world contributions (Lohman, this issue), the use of the term of *truly gifted* seems preposterous, as it implies that we know by default who is not "gifted" (i.e., who is a "fake") simply by virtue of some test scores or snap-shot clinical observations. Note that two future Nobel laureates and distinguished scientists, William Schockley and Luis Alvarez, were excluded from the Terman sample because their IQ scores did not make the cut! An exercise of humility in our judgment is not only an act of wisdom, but also a moral imperative.
- *Nature and Nurture*: From an interactionist point of view, a conception of giftedness as fixed and static personal trait is untenable. As Mönks and Mason (2000) pointed out, "a definition that strongly or exclusively emphasizes person-

ality traits neglecting the interactive nature of human development does little justice to the dynamic interplay of the developmental processes" (p. 146; see also Dai, Moon, & Feldhusen, 1998). This understanding becomes all the more important when the social environments in which children grow up are anything but a level playing field. Thus, a small advantage (or disadvantage) of the genetic or environmental nature can become a huge advantage (or disadvantage) over time, depending on reciprocity of the two (Dickens & Flynn, 2001; Papierno, Ceci, Makel, & Williams, this issue). On balance, the interaction argument also stresses the self-selective or personally biased nature of environmental influences. Talented persons advance their own development by choices they make or that are made for them to which they accede (e.g., activities they enjoy, people with whom they identify). In the early years, such developmental trajectories are prompted by certain developmentally instigative characteristics (e.g., novelty seeking, intellectual curiosity, or empathy and concerns over human conditions) or evocative characteristics (e.g., demonstrated artistic or intellectual precocity). Later on, with more cognitive sophistication, affective maturity, and self-understanding, the choice can be self-conscious and deliberate. An appropriate educational environment is responsive to signs of advancing development and related trajectories and pathways in order to provide needed support, technically and socially.

- *Nature in Nurture*: In light of the fact that genetic expressions in terms of proclivities or inclinations for certain domains and activities are always molded to some extent by culture, it becomes clear that a view of giftedness as a genetically based, preformed program, impervious to environmental influences, represents a simplistic conception. Rather, what we perceive and describe as gifted is likely the result of a coalescence or cooptation of several personal attributes (cognitive, affective, or conative), vis-à-vis a task or domain (Simonton, this issue), through a developmental process (Papierno et al., this issue), in a cultural context that nurtures the development of specific competence in question (Ericsson, Nandagopal, & Roring, this issue; Lohman, this issue; Miller, this issue). Thus we commit a fundamental error of *reification* when we treat gifted-

> ness as an *essence* that has a genetically predetermined or preordained unitary structure and, thus, enjoys a causal and explanatory power for certain developmental outcomes (Dai, 2005; see also Borland, 2003, for an alternative argument against reification; and Ziegler & Heller, 2000, for a discussion of the essentialist construal of giftedness). On the contrary, the variety of phenomena we labeled giftedness needs to be explained developmentally and, further, evolutionally, in the context of human endeavors of cultural and personal importance (Feldman, 2003). Besides, based on the nature-in-nurture argument, the concept of giftedness is fundamentally context-bound (Lohman, this issue); competence changes when context changes. A genetic effect, rather than having an independent identity, only reveals itself in specific nurturing conditions. If giftedness is fundamentally a dynamic, contextually defined quality, it follows that generativity and productivity that gives expression to the very giftedness should always be at the center of focus. In other words, rather than a static quality or absolute state of being, giftedness involves continual doing, changing, and "becoming" toward a more advanced level.

*Paradigm Competition and Shift*

For a long time in history since Terman (1925), the field of gifted education in North America has espoused a gifted-child paradigm, largely based on the nature assumption; that is, the gifted child is born, not made. Starting in mid-80s and particularly early 90s, many scholars envisioned a change in the direction of talent development, largely based on the nature-nurture interaction or nature-in-nurture assumption, that is, qualities we view as gifted and talented are developmental and contextual in nature (Feldhusen, 1992; Feldman, 1992; Gagné, 1985; Piirto, 1994; Renzulli, 1994; Subotnik & Coleman, 1996; Treffinger & Feldhusen, 1996). Indeed, some used the term *paradigm shift* to characterize the profound, systematic nature of changes needed in the field of gifted education (Borland, 2003; Feldman, 1992; Treffinger & Feldhusen, 1996). The competition between the old paradigm and the emergent paradigm lingers (Borland, 2003; Morelock, 1996). In the following section, we attempt to elucidate how ideas expressed in the preceding articles reinforce a talent-development orientation in gifted education. Contrary to the

gifted-child paradigm, which heavily relies on IQ cutoffs as a benchmark for giftedness (and degrees of giftedness), IQ is never to be the sole indicator of giftedness under the new framework. If anything, the papers in this issue could be interpreted to suggest that *focusing on defined areas of talent in a purposeful way would be a wiser course, one the field should move toward* (see also Feldman, 2003; Treffinger & Feldhusen, 1996). More specifically, we illustrate how these ideas might translate into practice in five areas of professional endeavor: (a) the stage-setting activity of programming for gifted education; (b) an identification policy that defines the purposes of identification and specifies selection criteria for the educational provision; (c) a curriculum designed to provide specific educational experience; (d) teaching that facilitates reciprocal interactions and promotes optimal growth; and (e) counseling that reflects an enabling model of talent development, rather than a special education model that focuses on special needs of gifted children (see Table 1).

*Programming*

Programming for gifted education is always guided, explicitly or implicitly, by a conception of the nature of giftedness (Moon & Rosselli, 2000). The gifted-child paradigm dictates that programming is geared toward very few who set them apart from the rest of the age populations and deserve an education uniquely suitable for them only. The talent-development paradigm is more flexible and broad in the scope of services because conceptions of giftedness are shifted from a status model (distinguishing between the generic gifted and the nongifted or different degrees of giftedness) to a developmental model, which is dynamic and contextual. In other words, the focus of programming changes from identifying "truly" gifted individuals to developing high-level expertise and creative productivity among those who demonstrate potential for specific lines of human endeavor or promising accomplishments. Providing appropriate educational experiences for children with high potential is a long-term proposition. The long-term trajectory of talent development highlights this issue. Signs of talent might appear at different times and under varying conditions, but development requires long-term involvement in a domain. The educational program must be rich in opportunity, flexible in response to changing rates of learning, open-ended to allow the person to exceed the bounds of any program, and engaging enough to set the stage for sustained motivation in deliberate practice and problem solving.

**Table 1**
**Implications for Programming, Identification, Curriculum, Teaching, and Counseling in Gifted Education**

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|---|---|
| Programming | • From an individual difference model of giftedness to a developmental model of giftedness<br>• From a special education mode to a talent development mode of programming<br>• From a rigid, status-based service to a flexible, needs-based service |
| Identification | • Identify educational needs, rather than gifted children per se (Lohman)<br>• Identify proximal, situation-specific aptitudes using local norms (Lohman)<br>• Distinguish between actualized potential and latent potential (Lohman; Papierno et al.)<br>• Identify unique individual profiles, including aptitudes and inaptitudes (Miller)<br>• Possible attribution biases (Ericsson et al.) |
| Curriculum | • Curriculum differentiation for individual students, not for the generic "gifted" (heterogeneity of giftedness; Simonton)<br>• Analysis of affordances and demands of a curriculum, vis-à-vis aptitudes and inaptitudes of a specific student (Lohman)<br>• Curriculum alignment with developmental trajectories and pathways, including changing affordances and demands |
| Teaching | • Instructional and learning activities, including deliberate practice, as proximal processes (Papierno et al.; Ericsson et al.)<br>• Aptitude-treatment interaction (ATI; Lohman)<br>• Essential instructional and mentorship experience<br>• The multiple role of teachers |
| Counseling | • Distinction between the gifted potential and gifted achievements (Lohman)<br>• 10-year or 10,000-hour rule; different developmental trajectories for different levels of expertise (Ericsson et al.)<br>• Multiple developmental pathways (Papierno et al.)<br>• Analysis of aptitudes and inaptitudes for a specific line of work (Lohman)<br>• Circumvention and compensation (Miller) |

*Note.* All names in parentheses refer to the authors in this special issue.

## *Identification*

The papers imply that the identification of giftedness is necessarily complex because the development of giftedness is complex and contextual. Equating some psychometric measures of ability

like IQs with giftedness and talent is problematic not only because it reinforces a misconception that IQ scores reflect natural ability or genetic effects (Lohman, this issue), but also because the heterogeneity or diversity of gifts and talents makes them less amenable to such uniform, standardized testing compared to the general population. In contrast, a corollary of a conception of giftedness as dynamic and ever changing is that the sole purpose of identification is to provide educational experiences responsive to developmental trajectories and educational needs of individual students as they are engaged in specific culturally valued endeavors. Thus, identification should be service-oriented (i.e., what educational provisions are warranted, given the demonstrated potential), rather than status-oriented (i.e., who is gifted). In other words, what are really *identified* are not the gifted persons but *educational needs* given proximal aptitudes for a specific line of work (Lohman, this issue; Renzulli & Dai, 2003). The content of the papers is consistent with high-quality professional practice as it pertains to identification. Best practice recommends using multiple measures in different areas or domains based on local (preferably culturally and socioeconomically stratified) norms, having opportunities for reassessment or reevaluation over time and connecting program outcomes to selection criteria.

The authors present a broader rationale for the soundness of the present procedures. Any program or school system that bases identification on using a single measure on a standardized test at one point in time is violating all that we know about identification in the emergent paradigm. It is likely that any line of human endeavor takes both dedicated, domain-specific and transferable, domain-general resources (Lohman, this issue; Miller, this issue). Not the least are motivational characteristics in terms of interest, passion, aspirations, and perseverance, without which sustained talent development is not possible (Ericsson et al., this issue; Lohman, this issue). This is why profiling individual students based on multiple sources of information is so important in identification. In principle, action information (proximal aptitudes and inaptitudes) should be given priority over status information (distal aptitudes and inaptitudes). Consequently, continual assessment of aptitudes or talent potential at different stages or phases of talent development poses new challenges to educators, particularly as it entails a deep understanding of contents and processes of talent development in a given domain (Johnsen, 2003).

*Curriculum*

The papers say little directly about curriculum when curriculum is defined as the content and experiences designed to promote the intended outcomes of programs. The gifted-child curriculum is to develop desirable traits conducive to their self-fulfillment and creative contributions. However, the gifted-child curriculum is criticized for neglecting development of domain-specific knowledge, skills, and dispositions (Margolin, 1996). In contrast, a curriculum for talent development should be both content and process based. Given the complex and diverse nature of talents and talent development, the curriculum has to be broad and supple in order to respond to a vast array of talents. Both discipline-based and interdisciplinary courses of action should be encouraged in formative years of talent development so that students (and their parents) will have opportunity to explore a variety of niche potential before they settle down for a specific domain—or carving out their own niche. Can schools be organized in this manner? We surmise that it is possible. But the school will have to change from the dominant model of schooling, the whole-child model that emphasizes well-rounded education, to the talent-development model for this to happen (Coleman & Cross, 2005). This said, in a world of scarce resources, it is unlikely that the general school curriculum can be responsible for developing many talents to the levels we deem necessary. At present, the general curriculum is organized to develop the beginning stages of some forms of talent, mainly verbal, mathematics, and sports, but not ready for later, more advanced stages. The emphasis on verbal and mathematical may not be as limiting as it appears because they are foundational domains that lay the groundwork for talent development in many other domains (Cross & Coleman, 2005). Special curricular provisions are warranted to further the course of talent development. In the early grades, pull-out programs may provide necessary enrichment experiences. In middle and high schools, as learning becomes more specialized and discipline based, self-contained and Advanced Placement classes could be a more viable option (Renzulli & Dai, 2003).

Based on the papers, curriculum designed for talent development can be seen as part of instructional planning intended to provide appropriate *proximal processes* of the interaction between a subject matter and a student (Papierno et al., this issue). According to Snow's (1994) aptitude theory (Lohman, this issue), the design should start with an analysis of affordances and demands of a curriculum, vis-à-vis aptitudes and inaptitudes as a baseline condition, and then move on to what instructional goals are to be achieved

with the curriculum unit in question. Ideally, curriculum should be fully aligned with what we know about the developmental trajectories related to specific domains. Although developmental trajectories, say, of a dancer and a chess player are drastically different (Papierno et al.), our knowledge of how a specific talent develops is still too limited (Johnsen, 2003) to directly inform curriculum. In general, however, curriculum planners will do well to heed two principles. First, each domain has unique affordances and demands (e.g., understanding historical texts requires an epistemology of the nature of such texts as a form of social communication; Wineburg, 1991; understanding Shakespeare or other fictional writings requires a deep sympathetic understanding of human dilemmas). Second, affordances and demands change as one moves to more advanced levels (Lohman, this issue). An aptitude at one stage of development can well become an inaptitude at another stage, as in the case of musically talented adolescents who experience crises while transitioning from a more intuitive, holistic mode of music processing to an analytic one (Bamberger, 1986). Being too rigidly adhering to the established doctrines of a domain (i.e., becoming too much of an expert) may also become a hindrance (i.e., inaptitude) for creative transformations in that domain (Frensch & Sternberg, 1989; Simonton, 1996). A curriculum of talent development will need to anticipate developmental hurdles and roadblocks and envision ways to overcome them.

*Teaching*

Approaches to teaching can also take two different paths: a "gifted pedagogy" and a pedagogy for talent development. The advocacy of a gifted pedagogy implies a strong "nature" conviction, highlighting qualitative differences between the gifted and nongifted in their approaches to learning tasks (see Coleman, 2003, and Kaplan, 2003, for a discussion). Although sometimes differential effects of instructional completeness were found—suggesting that students of high general ability are predisposed to impose structure on their own learning and more capable of filling the information gap in teaching, while their less able counterparts rely more on external guidance (Snow, 1994)—a pedagogy of talent development would put more emphasis on conditions conducive to further development of talents.

A pedagogy of talent development should be sensitive to signs of opportunity for sustained pursuits of knowledge and skill mastery in specific talent areas. The signs include emergent epistemic

or aesthetic interests, unusual rates of learning in a domain, persistence or task commitment in the face of challenges, proclivities for creative productive work. Although this pedagogical orientation is not antithetical to the notion of gifted pedagogy, it is more of a nurture position in that it facilitates long-term development based on what we know about the development of talent or high-level expertise. As Ericsson et al. (this issue) and Lohman (this issue) pointed out, even the most talented individuals need years of rigorous training, instruction, and extended deliberate practice and problem solving in order to achieve high-level expertise. Wineburg's (1991) research tells a poignant tale of the indispensable role of teaching: a group of bright high school students who were known for their penchant for history failed to appreciate history as an interpretive discipline. Shifting from fledgling schoolhouse talents to the most cutting-edge frontier of exploration, most Nobel laureates felt indebted to their "pedigrees" because their mentors taught them how to identify the most important problems in the field, how to ask the most theoretically interesting questions, and how to choose the most promising line of inquiry—in short, how to think productively and creatively in a domain (Shavinina & Seeratan, 2004). The influence of mentors for to-be-Nobel laureates was so profound that the process can best be described as *socialization* rather than mere teaching (Zuckerman, 1983).

By the same token, a pedagogical model of the talent-development slant should follow the professional practices and standards in a field as guidelines (Coleman, 2003). Curriculum and instruction thus become a deliberate course of induction into a field. Teaching for talent development in a specific field serves the same socialization function. Cognitively, teachers should model the way the professionals in the field feel and think about substantive issues and strategies and tactics to tackle specific issues. Affectively, they should model the intellectual curiosity, values, and motivations of the best minds in the field. They help the younger generation of scientists, artists, and social leaders crystallize their own passion and identity. Indeed, one of the most precious experiences a teacher can provide to students of promise is crystallizing experience (Walter & Gardner, 1986) whereby, among other possible outcomes, one's aspirations and purposes of life become crystallized or solidified.

### *Counseling*

Historically, counseling practice is based on the assumption that some children, by virtue of being gifted, have unique emotional

needs (Colangelo & Assouline, 2000). Granted that the gifted-child paradigm allows educators to identify unique psychological issues associated with specific types of children (e.g., those identified as gifted with leaning disability), a talent-development model of counseling would focus on enabling aspects of children's needs.

Although the papers offer few direct suggestions for practice, they do underscore some principles of development that would be useful for counselors and parents. Counselors needs to understand multipotentiality, extreme interest, requisite components or personal characteristics essential for a domain (i.e., niche potential), aptitudes and inaptitudes at different phases of talent development, developmental trajectories of a specific child, and motivational characteristics (e.g., delay of gratification) that facilitate extended deliberate practice and continued problem solving involved in advanced, nonuniversal development (Feldman, 2003).

Given the unequivocal nature of the prevalent, but problematic, labeling practice (Feldhusen & Jarwan, 2000; Renzulli, 1986, 1999), parents are often compelled to ask the question: "Is my child gifted?" The answer of either yes or no has social-emotional consequences (Coleman & Cross, 2000). The papers in this issue suggest that there is no simple answer to this question. As Renzulli (1986) argued many years ago, giftedness should be seen as a manifestation of human potential that can be nurtured and developed "in certain students (not all students), at certain times (not all times), and under certain circumstances" (p. 63). What seems important in the counseling process is not to confirm or disconfirm the giftedness of a child, because the general consensus among the authors is that the quality we identify as gifted is not static and absolute, but dynamic and contextual in nature. Instead, counselors can help teachers and parents to *identify*, diagnostically, strengths and weaknesses (i.e., aptitudes and inaptitudes) of a child with respect to a specific line of work; *conceptualize* possible developmental trajectories and pathways; and *suggest* options regarding educational interventions and parental actions. Although Miller (this issue) discusses a very unique population, savants, the principle of circumvention and compensation he alludes to seems widely applicable when it comes to determining a child's *niche potential*, given available options.

## Concluding Remarks

The five articles in this special issue epitomize a dialectical process of the nature-nurture debate in the context of giftedness and talent,

from bifurcated approaches (nature vs. nurture), to more integrated approaches (nature and nurture to nature in nurture), from identifying elements to taking account of dynamic or general system qualities. It is our hope that ideas advanced in the preceding papers, along with the recommendations we draw from them in the above five areas of practice, working in concert, help facilitate a new, more equitable and productive paradigm of gifted education many scholars and educators in the field have envisioned.

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