5. Giftedness, Creativity and Learning Style

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Abstract
What are the relationships among giftedness, creativity, and style? The task of responding to this question is formidable, given the challenge of defining each of these major constructs. In this article, we summarize the key findings of more than 25 studies and published reviews and examine ways in which the conceptual and operational complexity of the constructs have complicated or illuminated our understanding of the problem. We describe implications and challenges for theory, practice, and future research.

To understand the relationships among giftedness and talent development, creativity, and style, we must first consider the definitions of each of those complex constructs.

Giftedness. The terms gifted, giftedness, or gifted student have been defined in many and varied ways, and there has been little theoretical or operational consensus in the literature spanning more than five decades of inquiry. Many traditional definitions of the terms have focused on gifted in relation to intelligence and, often, more specifically, to IQ scores. Many approaches to defining intelligence now emphasize the multi-faceted, complex nature of human abilities or talents (e.g., Gardner, 1983, Sternberg, 1990; Taylor, 1986). In reviewing research on giftedness and learning style, we found that many studies used a narrow, traditional IQ-score-driven definition (sometimes using individual IQ, other times group IQ scores). Other studies reported using a definition of giftedness based primarily on standardized achievement test scores and, yet, others relied entirely on a school district’s characterization of students as “gifted,” often without any actual documentation of what indicators or criteria had actually been used by the schools. Clearly, the absence of conceptual or operational clarity about the term creates considerable difficulty in comparing or interpreting the results of correlations with learning style data.

Creativity. The construct of creativity has also received increased attention as an essential component of high-level performance and productivity. Today, some view creativity as an essential dimension of giftedness (e.g., Dunn, Dunn, & Treffinger, 1992; Renzulli, 1978). As with giftedness, creativity is a complex and multi-dimensional construct (e.g., Rhodes, 1961, Treffinger, Young, Selby, & Shepardson, 2002). Treffinger et al. (2002) reviewed over 100 sources that describe creativity characteristics. After identifying and synthesizing characteristics and indicators for which there was broad agreement in the literature, we divided them into four sets: generating ideas, digging deeper into ideas, openness and courage to explore ideas, and listening to one’s inner voice.

Characteristics in the Generating Ideas set described individuals who are open to and exhibit strengths in fluency, flexibility, originality, elaboration, and metaphorical thinking. Digging Deeper into Ideas involved analyzing, synthesizing, reorganizing or redefining, evaluating, seeing relationships, having a desire to resolve ambiguity or to bring order to disorder, and preferring or understanding complexity. The characteristics associated with Openness and Courage to Explore Ideas included problem sensitivity, aesthetic sensitivity and interests, curiosity, sense of humor, playfulness, the capacity for fantasy or imagi-
nation, risk-taking, tolerance for ambiguity, tenacity, openness and/or sensitivity to feelings and emotions, adaptability, intuition, a willingness to grow and change, resistance to accepting authoritarian assertions without examination, and the ability to integrate dichotomies. Last, Listening to One’s “Inner Voice” involved an awareness of one’s own creativeness, persistence, a need for autonomy, self-direction, self-discipline, tendency to be task-oriented, independence of thought, non-conformity, a need for reflection and introspection, intense concentration and absorption in the work, energy, a willingness to work hard, and an appreciation and capacity for thinking and work.

Traditionally, many researchers focused on creativity as personality and studied the traits or characteristics of highly creative people (e.g., MacKinnon, 1978), emphasizing their level of creativity (e.g., “How creative are you?”); however, through the past three decades, theory and research have increasingly turned to the question of one’s personal creative style (focusing on the question, “How are you creative?”).

Style. Theory and research also offer multiple conceptions of style. To illustrate ways in which concepts and models of style vary, consider two examples: the Dunn and Dunn learning style model (Dunn & Dunn, 1992, 1993) and recent work on problem-solving style (Selby, Treffinger, Isaksen, & Lauer, 2004; Treffinger, Selby, Isaksen, & Crumel, 2007).

The Dunns (1992, 1993) define learning style as the way in which each learner begins to concentrate on, process, absorb, and retain new and difficult information. They propose that the interaction of these elements occurs differently in each individual. Their model of style includes physiological (auditory, visual, tactile, and kinesthetic perceptual preferences; food or liquid intake, and mobility needs), sociological (learning alone, with a partner, as part of a small group or team, with peers, with an authoritative or collegial adult, or in a combination of ways), emotional (motivation, persistence, responsibility, conformity, and need for internal or external structure), and environmental (sound, light, temperature, and seating design) elements. They also consider indicators of global or analytic cognitive/psychological processing inclinations and impulsive versus reflective inclinations.

The VIEW problem-solving style model defines style as “consistent individual differences in the ways people prefer to plan and carry out generating and focusing activities in order to gain clarity, produce ideas, and prepare for action” (Treffinger, Selby, Isaksen, & Crumel, 2007). This model proposes three specific dimensions of problem-solving style, with two principal styles in each dimension:

- **Orientation to Change:** the person’s perceived preferences in two general styles for managing change and solving problems creatively: the Explorer (who prefers high-risk, high-novelty solutions and may feel constrained by external structure and authority) and the Developer (who prefers low-risk, practical solutions and is enabled by the guidance of structure and authority).
- **Manner of Processing:** the person’s preference for working externally (i.e., with other people early and throughout the process) or internally (i.e., thinking and working alone before sharing ideas with others) when managing change and solving problems.
- **Ways of Deciding:** the primary or initial emphasis the individual gives to people (i.e., maintaining harmony and interpersonal relationships) or to tasks (i.e., emphasizing logical, rational, and appropriate choices) when making decisions during problem solving or when managing change.

**Exploring the Relationships**

What are the relationships among giftedness, creativity, and style, and what are their implications for theory, research, and practice in gifted education? In this paper, we focus on four principal themes:

- **Style influences personal creativity characteristics and expanding conceptions of giftedness.**
- **Style influences how people learn and use a variety of creativity tools and methods to express and expand their strengths and talents, as well as their problem-solving performance.**
• Style influences teamwork skills.
• Creativity and style contribute positively to meaningful instructional differentiation for talent development.

Research suggests that there are significant relationships among personal style, creativity, and giftedness (including traditional psychometric views of giftedness and contemporary, broader perspectives on gifts and talents) and creativity. Selby and Treffinger (2003), for example, reviewed many studies of giftedness based on the Dunn and Dunn approach. We found that students identified as gifted (generally defined in traditional psychometric ways) differed from non-identified students in terms of their preferred style of learning as assessed by the Dunns' Learning Styles Inventory (LSI) (Dunn, Dunn, & Price, 1996). Certain style preferences appeared consistently in studies of learning style preferences among high-ability, high-achieving students. Dunn (1998), Dunn and Griggs (1985), Dunn, Griggs, Milgram and Price (1997 - 98), and Griggs and Dunn (1984) concluded that a greater percentage of students identified as gifted (compared with students not so identified) preferred quiet, low structure, bright light, and learning alone, unless the others learning with them are similarly-achieving peers. Gifted students also preferred formal, rather than informal, settings and learning in many ways when learning new and difficult material. Dunn (1998) reviewed many studies with high-ability students and described those students as perceptually strong, more persistent, more flexible, and internally controlled. There have been mixed results in relation to other learning style variables. Dunn (1998), Dunn, Griggs, Milgram, and Price (1997-98), Dunn and Price (1980), Griggs (1984), and Yong and McIntyre (1992) reported that gifted students preferred formal design, while Paskewitz (1985) supported the opposite conclusion. Coleman (1988), Honigsfeld (2000), Nations-Miller (1993), Paskewitz (1985), and Pederson (1984) found a preference for mobility, while Ricca (1984) did not. There have also been mixed findings relating to sound, light, time of day, auditory and visual preferences, and temperature. The mixed and inconsistent findings may result from variations in sample sizes, age, context, definition of giftedness (which often varied considerably among studies), or methodological differences among the studies reviewed. In addition, style preferences may differ in relation to talent and interest domains (e.g., Dunn, 1993; Honigsfeld, 2000; Milgram & Dunn, 1993; Treffinger & Selby, 1993). Honigsfeld (2000) found, for example, that students talented in science preferred tactual learning and teacher motivation, musically talented students preferred kinesthetic learning and were both teacher and parent motivated, and those with talents in literature were teacher and parent motivated and preferred visual learning. Dunn (1993) reported that students with strengths in a certain talent domain demonstrated, across cultures, similar preferences and differed significantly from students with strengths in different talent areas in their own or other cultures.

Comparing the results of these studies with personal creativity characteristics described above (Treffinger et al., 2002) resulted in several areas of possible overlap or relationship. Flexibility, for example, is a characteristic associated with generating ideas and creativity by several sources (e.g., Amabile, 1983; Starko, 1995) and is also commonly reported in relation to learning style preferences of the gifted (e.g., Dunn, 1998; Milgram, 1990; Paskewitz, 1985). Dunn, Griggs, Milgram, and Price (1997-98) also found that some gifted students prefer an analytic style; analysis is also associated with digging deeper into ideas (Treffinger et al., 2002). Persistence, self-direction, independence of thought, the need for alone time, and willingness to work hard were listed under listening to one's “inner voice.” Studies with the LSI link these or similar characteristics as learning style preferences of the gifted (e.g., Chan 2001; Honigsfeld, 2000; Mein, 1986; Paskewitz, 1985; Ricca, 1984; Yong & McIntyre, 1992).

Not all students identified as gifted or creative will share the same characteristics or style preferences (cf., Dunn & Griggs, 1985; Griggs & Dunn, 1984). Studies comparing learning style preferences with individual problem-solving styles (e.g., Selby et al., 2004) indicated that individual problem-solving style is not related to ability level.

Problem-solving style preferences are also related significantly to several dimensions of learning style. In comparing Milgram’s (1990) findings with those of Selby et al. (2004), one notes that persistence is a trait associated with high-ability students, as well as those
who prefer a Developer style when solving problems or managing change. Explorers, on the other hand—who seem just as capable in problem solving as Developers—do not display this preference to the same degree. Similarly, Developers are more authority motivated, while Explorers are more self-motivated. High-ability learners often prefer working in a formal rather than an informal environment and with low rather than high structure; however, this finding may vary when problem-solving style is considered. Developers prefer formal design and high structure, while Explorers prefer more flexibility and low structure. Students with the Explorer problem-solving style and learners identified as gifted prefer low structure and flexibility; however, as creative problem-solving style preferences move toward the Developer style, individuals appear to prefer less flexibility and more structure. Developers seem to know how to deal with structure and use it as a tool in successful problem solving, often at a high level, while Explorers often find structure constraining and confining, although they are also capable of high-level performance and accomplishments. Learning alone, a commonly reported preference among high ability learners, appears to be preferred by problem solvers with an Internal processing preference, while those with an External style prefer working with groups (especially groups of peers). Many high-ability students express a preference for quiet and bright light; bright light is preferred by Task-oriented problem solvers, but not by Person-oriented problem solvers. In general, then, considerable caution must be exercised in generalizing about giftedness or creativity as unitary constructs.

Research on the interactions between person and process has led to numerous advances in representing, studying, and applying the Creative Problem Solving (CPS) framework as a dynamic, flexible, and natural process (e.g., Isaksen & Treffinger, 2004; Treffinger, 2007). Contemporary approaches to CPS have also expanded our understanding of instruction in CPS and its applications in gifted education and talent development (Treffinger & Isaksen, 2005).

Wittig (1985) and Corbett-Whitier (1986) found learning style to be related to ways that children learn and successfully use the methods and tools of creative problem solving. Hurley (1993) and Schoonover (1996) found both quantitative and qualitative relationships between self-reported creative style and how individuals learn and apply various creative problem-solving tools. Selby (1997) reported qualitative evidence of a relationship between the problem-solving styles of middle-school students and their approach to creative processes. Similarly, studies reviewed by Isaksen and Geuens (2007) indicated that while problem-solving tools are style neutral, individuals with varying style preferences may be more comfortable, and more productive, when working with different tools and specific components of the problem-solving process.

Isaksen and Geuens (2007) examined the relationships between problem-solving style and individual preferences for learning and using Creative Problem Solving (CPS) tools, guidelines, stages, and components (e.g., Treffinger, Isaksen, & Stead-Dorval, 2006). In an exploratory study of 81 respondents, they found significant relationships between CPS and all three problem-solving style dimensions. For instance, in relation to generating options, Explorers reported significantly greater enjoyment and use of Brainstorming with Post-its®, as well as higher levels of use for tools for “affirmative judgment,” when focusing their thinking. In comparison with Internals, Externals reported higher levels of use of tools such as the Evaluation Matrix and guidelines relating to “striving for quantity.” The study supported the conclusion that style influences both the level of enjoyment in learning and the use of a variety of CPS tools and guidelines.

Treffinger (2006a) found that teams of adolescents (at both the middle and senior levels) who received feedback on their individual and team’s problem-solving style preferences performed significantly better than control group students who did not receive style feedback on evaluations by independent judges of problem-solving performance in the Future Problem Solving Program. The experimental groups’ evaluations exceeded those of the control groups by more than 20% on initial problem-solving task evaluations.

Treffinger and Purifico (2004) examined research and theory on teamwork in relation to effective performance by groups on Creative Problem Solving tasks. Their review yielded eight general factors that may be important in building effective CPS teams. These included:
common goals and purposes, shared responsibility and leadership, program expertise, process expertise, high communication, respect for people and ideas, focus on important results, and managing change.

In a study of problem-solving style, teamwork skills, and problem-solving performance, Treffinger (2006a) found that style feedback to adolescent students on problem-solving teams did not appear to enhance the students’ initial perceptions of their effectiveness of individual or group teamwork skills (which were generally quite high). Particularly at the middle-school (early adolescent) level, students may need instruction and support in managing collaborative behavior and in separating it from social relationships, peer pressures, friendship concerns, and other developmental issues; however, the data indicated significant relationships between the Manner of Processing dimension of problem-solving style and teamwork skills assessments. Teams with higher average External processing style scores had higher scores on teamwork skills assessments.

If we hope to reach the needs of students with high talent potential, differentiated instruction and flexible approaches to programming (rather than a single, fixed or “one-size-fits-all” program) are clearly required (Treffinger, Young, Nassab, & Wittig, 2004). This applies even to classes in which students are homogeneously grouped; every student has unique learning needs. Selby and Treffinger (2006) noted that an understanding of style is important to the successful differentiation of instruction. Specifically, they suggested that problem-solving style may relate to differentiating instruction in several ways.

**Explorers need**
- freedom to be spontaneous and to go in unusual directions and
- open-ended projects, novelty and permission to take risks.

**Developers need**
- structure, to know how new material fits into what they know and
- an understanding of what they are doing in terms of the big picture.

**Externals need**
- opportunities to be engaged, explore ideas, and gain clarity through discussion and
- projects involving others and outward events, allowing early active involvement.

**Internals need**
- opportunities for quiet reflection, apart from others, and
- projects tied to personal interests that can be pursued alone.

**Person-Oriented Deciders need**
- to understand how their work benefits others, and to develop rapport with peers, and
- to engage in human-focused projects involving collaboration in a supportive climate.

**Task-Oriented Deciders need**
- to explore cause-and-effect relationships with problems requiring in-depth analysis, and
- to learn through logical, sequential instruction and projects designed to bring order out of confusion.

Treffinger (2006b) observed, “All problem solvers need to be able to use any (and all) CPS components, stages, and tools, and they should believe that they can do so successfully and effectively.” Individuals tend to use many thinking tools and processes in unique ways while maintaining the power and effectiveness of both the process and tools. In instruction, it is important to remember that Developers prefer analytic tools and instructions on how to use them correctly. Explorers may begin modifying tools on their own, preferring tools that help generate many novel possibilities. Those with an External style prefer “high activity” tools and strategies, while Internals prefer more reflective ones. In terms of Ways of Deciding, Person-Oriented Deciders prefer tools that involve relationships, whereas Task-Oriented Deciders prefer tools that help them get directly to the task.

**Conclusion**

The constructs of giftedness, creativity, and style are clearly complex and multi-dimensional, and when we considered the interactions among the three constructs, the challenges became even more complex. Looking at research with students identified as gifted or of high ability, we found a set of style preferences that differentiates this group from those not so identified; however, the data also suggested that style preferences can vary
widely within and across talent domains, cultural contexts, and specific tasks in which they may be engaged. Our review also reinforced the conclusion that our understanding of these three constructs and their interactions is just in its infancy. Future research directed toward understanding the complex relationships among giftedness, creativity, and learning style will certainly require complex multivariate designs and analyses, careful definitions of multi-faceted variables, and multiple assessment tools. Educators must be cautious in their approach to recognizing and nurturing giftedness and creativity, investing effort in seeking many strengths and talents among students and in constructing dynamic, flexible approaches to curriculum and instruction. It is important for practitioners to gain as complete an understanding of the style preferences of each individual student and of the implications of style for the context of the activity at hand, (e.g., learning new and difficult material or working creatively on complex, open-ended problems). It is also important to recognize that the links between talent and style must be examined in relation to one’s specific conceptions.

For both researchers and practitioners, the power and potential of learning style derive more from understanding the dynamics of talent development and instructional differentiation than from categorization of people or the search for group differences. This is especially true, given the varying conceptions of giftedness, talent, and creativity that are prevalent today, the availability of multiple "windows" on individual style preferences, and the complexity of interactions among multiple variables. Continued research will certainly enhance our ability to bring style theory into practice, thereby increasing its power and also enabling us to increase, significantly, the effectiveness of instruction for all students. Designing and conducting education for personal strengths, talents, and creativity challenge us to look to new approaches and tools for assessment, curriculum, instruction, and evaluation, lest we find that in our zeal for "high-stakes assessment," we have left many children behind.

References


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Endnotes

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