

Characteristics of Effective Teachers of Gifted Students: Teacher Background and Personality Styles of Students

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ABSTRACT

This study was designed to explore characteristics of exceptional teachers of gifted students. Participants included 63 teachers and 1,247 highly able students. Teachers responded to 2 measures: a background questionnaire and the Myers Briggs Type Inventory (MBTI), a self-report personality inventory. Students also completed the MBTI. In response to the background questionnaire, the majority of teachers reported holding advanced degrees in a content area; most were not certified to teach and reported completing no formal coursework in gifted education. Results from the MBTI indicated that exemplary teachers were more likely to prefer N (intuition) and T (thinking), as compared to a normative teacher sample. The personality types of teachers were in many ways similar to the personality types of the gifted students. These findings suggest that teachers who are judged to be highly effective in working with gifted students prefer abstract themes and concepts, are open and flexible, and value logical analysis and objectivity. Results suggest that teacher personality and cognitive style may play a role in his or her effectiveness in teaching gifted students.

Every day, teachers around the country are entrusted with the task of fostering the academic and intellectual development of the students they teach. However, each teacher is a unique individual, with his or her own personality, experiences, and way of perceiving the world. And each student is equally unique. Sometimes, students succeed and excel; but, at other times, even the brightest students' innate curiosity wanes and they underachieve. Some have argued that teachers who are particularly effective in teaching one group of students may not be equally effective in teaching other students (Barto, 1998; Brophy

& Good, 1986). Why are some teachers more effective in teaching some students, particularly gifted students, than others? Specifically, what are the characteristics of exemplary teachers of gifted students?

Bright, gifted students are a unique population, and teaching them presents its own rewards and challenges. It

PUTTING THE RESEARCH TO USE

The findings from this study suggest that certification and formal training in gifted and talented education may not be sufficient factors to consider when selecting teachers of gifted students. Instead, it may be equally important to select teachers with a strong background in the academic discipline being taught and those who have a passion for the subject matter. In addition to this expertise, certain personality and cognitive style preferences may be critical (and often ignored) factors to consider.

Although it might seem ideal to match students with teachers who have the same cognitive style, this is often unrealistic. A better recommendation would be to expose students to many different styles of teaching and teachers with many different cognitive preferences. Students need to understand styles other than their own. They also need to know how to modify their particular preferences and style to better fit different learning environments.

It seems especially important for teachers of gifted students to be made aware of how these students may differ from the majority of their classmates and how the teachers can accommodate these differences. Finally, it seems important for all teachers to be aware of how many gifted students may differ from their classmates in cognitive style preferences so that these differences can be recognized and validated.

has been argued that some teachers might be better suited for teaching gifted students than other teachers. For example, Mandrell and Fiscus (1981) argued that not all teachers should be assigned to teach the gifted. The empirical research to date suggests that the following characteristics describe effective teachers of the gifted: enthusiasm (Chandler & Bean, 1998; Heath, 1997; Sisk, 1989; Whitlock & DuCette, 1989), flexibility (Renzulli, 1992), creativity (Chandler & Bean), and expertise in the area being taught (Bishop, 1968; Sisk). However, there remain unanswered questions regarding the personality and cognitive styles of effective teachers and relations between the personality and cognitive styles of teachers and those of the gifted students they teach.

Whitlock and DuCette (1989) interviewed 10 teachers who were identified as outstanding teachers of gifted students by a panel of experts and concluded that the outstanding teachers differed from more average teachers in enthusiasm, self-confidence, ability to apply knowledge, and in having a strong achievement orientation. Milgram (1979) had students judge the relative importance of intelligence, creativity, and personal/social characteristics (e.g. sympathetic, sensitive) in their teachers and found that students overwhelmingly judged intelligence most important. Similar results were reported by Tzidkiyahu (1975) for students in 6th through 12th grade. Westberg and Archambault (1997) conducted observations in classrooms and concluded that advanced training (i.e., graduate degrees) and willingness to embrace change differentiated classes successful in serving high-ability students from other classes.

Other researchers have looked specifically at self-reports of personality styles of effective teachers of gifted students. On the basis of over 50 teachers' responses to a self-report personality inventory, Chandler and Bean (1998) concluded that exemplary teachers are more achievement-oriented and intellectual than teachers from a normative group. Other researchers (Provost, Carson, & Beidler, 1987) gave a small sample of exemplary teachers (finalists for national Professor of the Year) the Myers-Briggs Type Indicator (MBTI) and found that two-thirds of them were extraverted (E) and intuitive (N) types, indicating that extraverted energy and flexibility were characteristic of the outstanding teachers.

Sisk (1989) reviewed research on teaching gifted students and concluded that the following criteria were necessary for a teacher to teach this population effectively: a democratic attitude, competency in an academic discipline, empathy, a high tolerance for ambiguity, and enthusiasm. Based upon his review of the literature, Renzulli

(1992) concluded that the following characteristics were necessary in teachers of gifted students: advanced competency in the area of academic specialization, the ability to apply knowledge to solve real-life problems, flexibility, openness, high energy, a commitment to excellence, and the ability to convey a passion for the subject matter. Based upon their synthesis of the research, Howley, Howley, and Pendarvis (1986) suggested that teachers of the gifted should be "teacher-scholars" or experts in the area they teach.

In one of the most rigorous studies in this area, Bishop (1968) studied more than 200 teachers of gifted students. These teachers were administered psychological tests and were observed in their classrooms. Subsamples were intensively interviewed. Approximately half of the sample of teachers had been identified as exemplary by their gifted students. Bishop concluded that the exemplary teacher group was characterized by superior intelligence, greater literary and cultural interests, and higher achievement needs. Further, teachers in the effective group more often reported that they entered the teaching profession for their own intellectual growth. In the classroom, the exemplary teachers were more stimulating and imaginative, and they tended to be more student-centered in their teaching style. At the same time, these teachers were also more systematic and orderly. The effective teachers were well versed in and enthusiastic about their subject matter, and they defined their own success as a teacher by how well they motivated their students. These teachers also indicated a preference for teaching gifted students.

Interpreting Bishop's findings, Howley et al. (1986) suggested that the characteristics of the effective teachers documented by Bishop were similar to those typically ascribed to gifted students. These characteristics included creativity, tolerance for ambiguity, and interest in literature and cultural matters. Other researchers have also suggested that successful teachers of gifted students share personality and cognitive orientations with the students they teach. For example, Renzulli (1992) argued that we should "devote considerable effort to analyzing the preferred learning styles of students and look for opportunities to place students with teachers who have compatible styles" (p. 58). The match between the personality and cognitive styles of gifted students and teachers has not been studied empirically. However, there is some indication that the personality and cognitive styles of gifted students differ from those of more average-achieving students.

Based on studies conducted using the MBTI, McCaulley and Natter (1974) concluded that higher achieving students were more likely to demonstrate a pref-

erence for intuitive processing (N) than more average-achieving students. This preference for N in academically talented students was also found in a study of MBTI profiles in U.S. and Irish students (Mills, 1993; Mills & Parker, 1998) and in a study of MBTI profiles of gifted students attending a magnet school (Hawkins, 1998). This preference for intuition on the part of gifted students likely sets them apart not only from their more average-achieving peers, but also from most teachers. Normative data on middle school teachers indicates that less than half of teachers demonstrate a preference for intuitive processing (Macdaid, McCaulley, & Kainz, 1986), although this pattern was reversed in a group of student teachers pursuing the master in teaching degree (Willing, Guest, & Morford, 2001). Again, the relationship between teachers' and students' cognitive styles and preferences has not yet been systematically explored.

In summary, studies of characteristics of effective teachers indicate certain broad orientations thought to be related to effective teaching. However, few studies have systematically explored the personality characteristics or cognitive styles of exemplary teachers of gifted students, and there remain unanswered questions regarding how exemplary teachers of gifted students differ from the broader population of teachers. In addition, prior research does not address the issue of congruence between personality and cognitive styles of students and teachers. This study was designed to document personality type and cognitive preferences, as measured by the MBTI, of effective teachers of gifted students and of gifted students themselves.

The MBTI was used in the present study because it has been used extensively to identify the personality and cognitive preferences of teachers (Macdaid, McCaulley, & Kainz, 1986; McCaulley & Natter, 1974), as well as educational outcomes. More recent studies have begun to look at the MBTI profiles of subgroups within the teaching profession (Sears, Kennedy, & Kaye, 1997; Willing, Guest, & Morford, 2001) and those of teachers judged to be "effective" or "excellent" (Clark & Guest, 1995; Fisher & Kent, 1998; Provost, Carson, & Beidler, 1987; Sikora, 1999).

Another reason the MBTI was chosen for this study was because researchers at the Center for Talented Youth (CTY) of Johns Hopkins University have repeatedly shown that the MBTI profiles of gifted students differ significantly from those of normative populations in terms of academic ability and achievement (Mills, 1993; Mills, Moore, & Parker, 1996; Mills & Parker, 1998). A number of studies supporting both the psychometric properties and construct validity of the MBTI have recently refocused attention on its usefulness in personality research

(Carlson, 1985; Cummins, 1995; Hicks, 1984; Jackson, Parker & Dupboye, 1996; Johnson, 1997; Nordvik & Brovold, 1998; Tischler, 1994), as well as in understanding cognitive and learning styles (Robertson, 1997). A great deal is known about how the MBTI relates to other established personality measures (e.g., Thorne & Gough, 1991). However, recent research establishing the close alignment of the MBTI scales with four of the five factors in the five-factor model of personality (Furnham, 1996; MacDonald, Anderson, Tsagarakis, & Holland, 1994; McCrae & Costa, 1989; Parker & Stumpf, 1998) has added greatly to the validity of the test and has renewed the interest of researchers in this measure.

Method

For more than 20 years, The Center for Talented Youth of Johns Hopkins University has worked with, and provided educational experiences for, academically gifted children from across the United States. Each year, CTY provides advanced level high school or college-level classes for over 6,000 middle school and early high school students (grades 7–10) who have been identified as academically talented through a rigorous selection process. Students who qualify and elect to participate in summer programs spend 3 weeks on a college campus focusing on a single course for the duration of that time period. This extensive involvement in the education of gifted students has afforded researchers at CTY an opportunity to study the characteristics of effective teachers of gifted students.

Participants

Sixty-three teachers from CTY summer programs who were identified as exemplary participated in this study. Administrators responsible for hiring and oversight of CTY's summer programs were asked to select the most outstanding teachers from among those who had taught at CTY for 2 or more years. Teachers were selected as "exemplary" based on observations and performance ratings from CTY administrators and evaluations of teachers completed by students (objective ratings of teacher effectiveness as judged along a number of dimensions, including knowledge of content, preparedness, concern for individual learning, and openness to differing opinions). From a total pool of 400 teachers, 85 individuals were identified as exemplary and invited to participate in this research. In response to this invitation, 65 teachers (74%) agreed to participate. Teachers were then asked to com-

plete a background questionnaire and the Myers-Briggs Type Indicator (MBTI).

Participating teachers ranged in age from 20 to 73, with a mean age of 35.4 ($SD = 12.0$). Approximately 63% of the teachers were male. On average, these exemplary teachers had taught at CTY for slightly more than 4 years and had more than 8 years experience working with gifted students. More than 79% of these teachers reported that they had never taken a course on gifted students or gifted education. However, the majority of the CTY teachers (66.7%) were primarily employed in the field of education, and many were teaching at the college/university level (28.6% of the total sample). While the majority (84.1%) of the CTY teachers had advanced degrees (master's and doctorate), less than one-third of the total sample (31.7%) was certified in teaching. This is not surprising, however, since about one-third of CTY teachers are not working in education, and, of those who are in education, many are teaching at the college/university level where certification is not an issue (a more thorough compilation of demographic variables of the sample is presented in Table 1).

In addition to the teacher sample, a sample of 1,247 students who attended CTY summer programs also participated in this study. These students were independently selected from CTY classes; they were not specifically selected from classes taught by the teachers in the study, although some may very well have been students of the participating teachers. By design, no attempt was made to link teachers and students in the study.

Eligibility for participation in CTY summer programs is determined through a rigorous selection process. First, seventh-grade students who score at the 97th percentile or higher on nationally normed standardized assessments (e.g., CAT, ITBS, CTBS) are invited to participate in CTY's talent search. Then, these students take the Scholastic Assessment Test (SAT), a nationally recognized standardized test designed for high school juniors and seniors. Finally, those students who score at or above the mean for college-bound seniors in verbal, quantitative reasoning, or both are invited to participate in the CTY summer programs.

Participating students ranged in age from 13 to 16 years of age. The sample consisted of 559 (45%) female and 688 (55%) male students. Most (70%) of the students were White; the remaining students were classified as Asian (25%) or as African American or Hispanic (5%). The mean SAT-Verbal score for this sample was 497; the mean SAT-Math score was 479. These students were given the MBTI while attending summer programs (teachers and students completed the MBTI at different times, as the two samples were not related).

Table 1

*Demographic and Background Data
for Exemplary Teachers**

<i>Gender</i>	
Male	63.5% (40)
Female	36.5% (23)
<i>Age</i>	
mean = 35.4, standard deviation = 12.0	
<i>Major in College</i>	
Humanities	47.5% (30)
Science	28.5% (18)
Math	19.0% (12)
Education	5.0% (3)
<i>Highest Degree Obtained</i>	
Bachelor's	15.9% (10)
Master's	55.5% (35)
Doctorate	28.6% (18)
<i>Principal Occupation</i>	
Education	66.7% (42)
Math/Science	7.9% (5)**
Arts	7.9% (5)**
Business	3.2% (2)
Military	3.2% (2)
Human Services	1.6% (1)
Graduate School	9.5% (6)
<i>Years in Principal Occupation</i>	
mean = 11.7, standard deviation = 10.6	
<i>Years Working with G/T Students</i>	
mean = 8.6, standard deviation = 7.5	
<i>Years Teaching at CTY</i>	
mean = 4.2, standard deviation = 2.7	
<i>Number of G/T Courses Taken</i>	
None	82.5% (52)
One	9.5% (6)
2 or more	7.9% (5)
The remaining responses are just from those whose primary occupation is education . This group included 42 individuals or 66.7% of the total sample.	
<i>Grade Level</i>	
Middle School	4.8% (2)
High School	52.4% (22)
College	42.8% (18)
<i>Certified Teacher</i>	
No	52.4%(22)***
Yes	47.6% (20)

Note. *N = 63; ** Profession in mathematics, the sciences, or the arts, but not as a teacher; *** Certification to teach is not an issue for college professors, who comprise approximately 43% of the sample whose primary occupation is education.

Measures

Participating teachers were given a background questionnaire designed to gather basic demographic information (e.g., gender, age), as well as professional training and experiences. Questions also addressed their principal occupations and experience working with gifted students.

Teachers and students were independently given Form G of the Myers-Briggs Type Indicator (Myers & McCaulley, 1985). Students took the MBTI in small-group settings with a test administrator, while teachers completed the MBTI individually. The MBTI is a forced-choice, self-report measure of preferences on four bipolar dimensions that are typically scored dichotomously: extraversion-introversion, sensing-intuition, thinking-feeling, and judging-perceiving. Combinations of the four dimensions form 16 possible "types." These types are not fixed or static personality traits; rather, they represent preferences. Depending upon time, development, and situation, one can shift his or her relative position on the four bipolar dimensions of the MBTI, although in general our preferences remain fairly stable.

The extraversion-introversion (E-I) dimension refers to preferred modes of relating to the external world. Extraverts (E) tend to be action-oriented, sociable, sometimes impulsive individuals who are more interested in the outer world of people and experiences; introverts (I) tend to be contemplative, detached individuals who are more interested in the inner world of thoughts and ideas. The sensing-intuition (S-N) dimension refers to how individuals prefer to take in and process information. Sensing (S) refers to a preference for working with known facts, and individuals with this preference tend to be practical realists; intuition (N) refers to a preference for the abstract and symbolic, a predisposition for seeking relationships and possibilities. On the thinking-feeling (T-F) dimension, thinking (T) types prefer a logical, impersonal, analytical style of decision making, while feeling (F) types prefer a subjective, interpersonal style of decision making, considering values, aesthetics, and personal implications. Finally, the judging-perceiving (J-P) dimension refers to preferences for either a decisive, planned, orderly, systematic approach (judging; J) or a more flexible, adaptable, and spontaneous style (perceiving; P).

Scoring

Several methods of scoring the MBTI for learning and teaching styles, in addition to the usual preference scores for the four personality dimensions and the frequency dis-

tributions for the 16 MBTI types, have been developed. One of the most popular models was developed by Golay (1982) and is based on the SJ (Structured Realist), SP (Action-Oriented Realist), NF (Idealistic Humanist), and NT (Rational Theorist) dimension pairs discussed by Kiersey and Bates (1984). A second popular model, developed by Kalsbeek (1989), uses the IN (Abstract-Reflective), EN (Abstract-Active), IS (Concrete-Reflective), and ES (Concrete-Active) dimension pairs. Both of these scoring systems were used in this study, in addition to the typical scoring procedure utilizing frequency distributions for each dimension and for each of the 16 types to explore the data more fully.

Results

Table 2 contains the frequency distribution of MBTI types for the exemplary CTY teachers ($N = 63$) and for the CTY summer program participants ($N = 1,247$). For purposes of comparison, MBTI data for a large, normative sample of middle school teachers is also presented in Table 2 ($N = 1,128$; Macdaid, McCaulley & Kainz, 1986).

There were striking differences in the type distribution for the three groups. The four most common types (out of 16 possible types) for the CTY exemplary teachers were INTJ, ENTJ, ENFJ, and ENFP, with these four types accounting for more than 60% of the sample. All of these types favor intuition (N) over sensing (S). For the normative sample of middle school teachers, the four most common types were ISFJ, ESFJ, ISTJ, and ESTJ, with these types accounting for almost half the sample. All of these types prefer sensing (S) over intuition (N). The four most common types for CTY students were INTP, ENFP, ENTP, and INFP, with these types accounting for over half of the sample. The gifted students shared the CTY teachers' preference for intuition (N).

The percent of individuals falling into each MBTI category is illustrated in Table 3 for these three groups: CTY exemplary teachers, the normative sample of middle school teachers, and CTY gifted students. Yates-corrected chi-squares for each of these four dimensions comparing CTY teachers and normative teachers yielded statistically significant differences for the S-N dimension ($\chi^2 = 32.53$, $p < .000$) and the T-F dimension ($\chi^2 = 21.39$, $p < .000$). The CTY exemplary teachers were more likely to manifest N and T than teachers from the normative sample. Eighty-three percent of CTY exemplary teachers were classified as N, compared to 45% of the normative sample of teachers. Almost 70% of CTY exemplary teachers were

Table 2

Type Distribution of CTY Exemplary Teachers, a Normative Sample of Middle School Teachers, and CTY Students

MBTI Type*	CTY Teachers (N = 63)	Norm MS Teachers (N = 1,128)	CTY Students (N = 1,247)
ISTJ	5 (7.9%)	126 (11.2%)	112 (9.0%)
ISFJ	0 (0.0%)	138 (12.2%)	27 (2.2%)
INFJ	1 (1.6%)	56 (5.0%)	57 (4.6%)
INTJ	14 (22.2%)	51 (4.5%)	116 (9.3%)
ISTP	2 (3.2%)	26 (2.3%)	46 (3.7%)
ISFP	0 (0.0%)	36 (3.2%)	17 (1.4%)
INFP	3 (4.8%)	67 (5.9%)	127 (10.2%)
INTP	5 (7.9%)	27 (2.4%)	185 (14.8%)
ESTP	1 (1.6%)	20 (1.8%)	40 (3.2%)
ESFP	0 (0.0%)	43 (3.8%)	20 (1.6%)
ENFP	6 (9.5%)	124 (11.0%)	170 (13.6%)
ENTP	5 (7.9%)	44 (3.9%)	147 (11.8%)
ESTJ	2 (3.2%)	103 (9.1%)	43 (3.4%)
ESFJ	1 (1.6%)	130 (11.5%)	24 (1.9%)
ENFJ	8 (12.7%)	88 (7.8%)	35 (2.8%)
ENTJ	10 (15.9%)	49 (4.3%)	81 (6.5%)

Note. *The MBTI is a measure of preferences on four bipolar dimensions that are typically scored dichotomously: extraversion (E) vs. introversion (I), sensing (S) vs. intuition (N), thinking (T) vs. feeling (F), and judging (J) vs. perceiving (P).

classified as T, while only 40% of the normative sample of teachers were classified as T.

When the CTY teachers are compared to CTY students, only the J-P dimension produced a statistically significant difference ($\chi^2 = 14.95, p < .000$). More gifted students (60%) were classified as P than CTY teachers (35%). CTY teachers were similar to CTY students on the three remaining dimensions: E-I (52% teachers and 45% students E), S-N (83% teachers and 74% students N), and T-F (70% teachers and 62% students T). By comparison, normative teachers differed from CTY students on all four dimensions (E-I: $\chi^2 = 16.61, p < .000$; S-N: $\chi^2 = 204.02, p < .000$; T-F: $\chi^2 = 116.07, p < .000$; and J-P: $\chi^2 = 160.37, p < .000$). More CTY students than normative teachers were classified as N (74% students and 45% normative teachers), T (62% students and 40% normative teachers), I (55% students and 47% normative teachers), and P (60% students and 34% normative teachers).

Table 4 presents the MBTI data from the perspective of the Kalsbeek and Golay models of learning and teaching

Table 3

*Distribution of the Four MBTI Dimensions**

	CTY Teachers (N = 63)	Norm MS Teachers (N = 1,128)	CTY Students (N = 1,247)
E-I Dimension			
E %	52.4	53.3	44.9
I %	47.6	46.7	55.1
S-N Dimension			
S %	17.5	55.1	26.4
N %	82.5	44.9	73.6
T-F Dimension			
T %	69.8	39.5	61.7
F %	30.2	60.5	38.3
J-P Dimension			
J %	65.1	65.7	39.7
P %	34.9	34.3	60.3

Note. *The MBTI is a measure of preferences on four bipolar dimensions that are typically scored dichotomously: extraversion-introversion (E-I), sensing-intuition (S-N), thinking-feeling (T-F), and judging-perceiving (J-P).

style. Using the Kalsbeek model, there is no difference in learning and teaching style between CTY teachers and students ($\chi^2 = 4.12, df = 3, p = .25$). There was, however, a statistically significant difference between the two teacher groups ($\chi^2 = 34.88, df = 3, p < .000$, Contingency Coefficient = .17) and an even greater difference between the normative teacher group and CTY students ($\chi^2 = 231.03, df = 3, p < .000$, Contingency Coefficient = .30). The preponderance of the CTY teachers and students were either Abstract-Reflective (IN) types or Abstract-Active (EN) types. By comparison, these types (IN and EN) comprised a minority of the normative teacher sample.

A similar pattern of results was found using Golay's model. Using this model, there was no statistically significant difference found between CTY students and CTY teachers ($\chi^2 = 4.39, df = 3, p = .22$). There was again a difference between the two groups of teachers ($\chi^2 = 68.29, df = 3, p < .000$, Contingency Coefficient = .23) and a difference between normative teachers and CTY students ($\chi^2 = 291.76, df = 3, p < .000$, Contingency Coefficient = .33). Many more of the exemplary teachers were NTs (intuitive thinkers, also referred to as Rational Theorist and Conceptual Specific types) compared to normative teach-

ers. Together, NTs (intuitive thinking) and NFs (intuitive feeling) accounted for almost three-fourths of the sample of exemplary teachers. These results indicate that the exemplary CTY teachers differed significantly from a normative sample of middle school teachers. Further, the preferences of gifted students differed significantly from a normative sample of middle school teachers, but were very similar to the exemplary teachers in this study.

Discussion

The purpose of this study was to explore the background, personality type, and cognitive preferences of exemplary teachers of the gifted and to compare the personality and cognitive styles of effective teachers with those of the gifted students they teach. Findings indicated that, although many of the effective teachers had advanced degrees and the majority were working in the field of education, few of them had formal training in gifted education. With respect to cognitive preferences, a significantly greater percentage of exemplary teachers of the gifted were classified as Ns and Ts on the MBTI, as compared to a normative sample of teachers. Moreover, MBTI profiles of the exemplary teachers were highly similar to MBTI profiles of gifted students, while the MBTI profiles of the students were significantly different from MBTI profiles of a normative sample of teachers. What do these findings mean for understanding exemplary teachers of gifted students?

This sample of teachers appears to exemplify the notion of "teacher-scholars," where teachers are experts in the area they teach (e.g., Bishop, 1968; Howley et al., 1986; Renzulli, 1992). The vast majority of these teachers held advanced degrees in their area of expertise, while few held formal teaching certificates and few had completed extensive coursework in gifted education. Thus, it appears that formal training in the field of gifted education may not be as important for teaching gifted students as a strong background and interest in an academic discipline.

One of the most striking and consistent findings in this study was the observed match in personality styles between the academically talented students and the exemplary teachers. On both the thinking-feeling and the sensing-intuition dimensions of the MBTI, the academically talented students were more similar to the exemplary teachers than the normative sample of teachers. In fact, the CTY students differed significantly from the normative sample of teachers on each of the four dimensions of the MBTI, while demonstrating profiles strikingly similar to the effective teachers.

The most striking difference was seen on the sensing-intuition (S-N) dimension, where the majority of the exemplary CTY teachers showed a preference for an abstract and theoretical orientation (N). Individuals with a preference for N typically prefer to see the big picture, engage in abstract reasoning, and generate ideas; they tend to be innovative and intuitive and see patterns and themes. Similar findings on the MBTI (i.e., preference for intuition) were reported in previous research based on a smaller sample of exceptional college professors (Provost, Carson, & Beidler, 1987). In addition, other researchers have argued that teachers of gifted students should demonstrate flexibility and openness, have the ability to apply knowledge to solve real-life problems, and have a high tolerance for ambiguity (Renzulli, 1992; Sisk, 1989; Whitlock & DuCette, 1989). Each of these characteristics is consistent with a preference for intuitive processing.

Additionally, individuals with an N preference are thought to prefer creative approaches (e.g., Thorne & Gough, 1991). It is likely that teachers with a preference for N are individuals who use creative approaches in their teaching and in their classrooms. Indeed, Bishop's (1968) finding that exemplary teachers are often more imaginative and stimulating than other teachers supports this interpretation.

Teachers from the normative sample were quite different on this dimension, with less than half sharing a preference for intuitive processing. This dimension most strongly separates the exemplary teachers in this study from a normative sample. In addition, the match between the gifted students and the exemplary teachers in their preference for intuitive processing may help explain these teachers' effectiveness.

On the thinking-feeling dimension of the MBTI, CTY teachers and CTY students again differed from teachers in the normative sample. Most CTY teachers expressed a preference for the "thinking" style, as did many CTY students, while many fewer teachers in the normative middle school teacher sample expressed this preference. The thinking preference is associated with an analytical approach to decision making. This suggests that an analytical problem-solving approach might be another important factor when teaching gifted students.

The only significant difference found between the exemplary teachers and the gifted CTY students was on the J-P dimension. The exemplary teachers reported a preference for judging (J). Individuals classified as Js have a preference for structure, order, and closure. The exemplary teachers' observed preference for judging supports Bishop's (1968) finding that exemplary teachers were more system-

atic and orderly than teachers not judged to be exemplary. In contrast, the CTY students reported a preference for perceiving (P). In comparing the teachers and students, it appears that teachers have a stronger need for structure and organization than the students they teach. However, there is some preliminary evidence that this might reflect a developmental difference, rather than a personality difference *per se* (Mills, Moore, & Parker, 1996).

Similar results were seen when looking at the data from the perspective of Golay's and Kalsbeek's categories. Using Golay's model, the majority of these exemplary teachers described themselves as either intuitive thinkers or intuitive feeling types. These two types of individuals are considered to have either a rational-scientific orientation, often seen in theoretical mathematicians and innovative scientists, or a humanities orientation, as is often seen in creative artists and writers. Using Kalsbeek's model, the preponderance of exemplary teachers were either Abstract-Reflective or Abstract-Active types. These cognitive style preferences show a strong predilection for dealing with the abstract and the conceptual. Again, the MBTI profiles of the gifted students very closely resembled those of the exemplary teachers (and differed from the normative teacher sample) with respect to their cognitive preferences.

The observed parallels in the personality and cognitive styles of the exemplary teachers and the gifted students raise an important question regarding determinants of effective teaching: Are some teachers highly effective because they possess certain personality styles, or are some teachers effective because their personality styles more closely match their students' personality styles?

In summary, as evidenced by the prevalence of advanced degrees, these teachers appear to have a passion for their discipline. These exemplary teachers also appear to have a strong preference for the abstract and conceptual. Additionally, the teachers in this study had personality characteristics that, for the most part, mirrored the personality characteristics of the students they teach. These same personality characteristics set the exemplary teachers, and their students, apart from a normative population of teachers. What then, are the implications of these findings for educators working with gifted children?

Implications

It is widely accepted that teachers need formal training with a strong emphasis on methodology courses that leads to certification to be considered competent, capable teachers (e.g., Heath, 1997; Shore, Cornell, Robinson, &

Ward, 1991). Indeed, the quality of an educational system is often assessed, in part, by documentation of the "credentials" of teachers. Further, it is popular to advocate for more requirements for certification as a strategy for improving the quality of education.

The findings from this study, however, suggest that certification and formal training in gifted and talented education may not be sufficient factors to consider when selecting teachers of gifted students. Findings from this study suggest instead that it is equally important to select teachers with a strong background in the academic discipline being taught and those who have a passion for the subject matter. In addition to this expertise, certain personality characteristics and cognitive style preferences may be critical (although often ignored) factors to consider.

Mills and Parker (1998) suggested that gifted students, because of their preferences for introversion and intuition (IN), are in the minority in the classroom because of both their high ability and their personality style. They further suggested that this could lead to feelings of isolation and being misunderstood. This isolation could then adversely affect their motivation and achievement. It is possible, therefore, that underachievement in gifted students could be related to a mismatch between the cognitive styles of some gifted students and that of most of their classroom teachers. If this were true, we might expect bright students to benefit from greater contact with teachers who are more similar to them in personality and cognitive style.

Although it might seem ideal to match students with teachers who have the same cognitive style, this is often unrealistic. And we know that subject matter also dictates the way in which learning takes place. Perhaps a better recommendation would be to expose students to many different styles of teaching and teachers with many different cognitive preferences. Cognitive style as studied here is a set of personal preferences, not a static set of skills. Students need to understand styles other than their own and they need to know how to modify their particular preferences and style to better fit different learning environments.

On the other hand, it would seem especially important for teachers selected to teach gifted students to be made aware of how these students may differ from the majority of their classmates and how the teachers can accommodate these differences. For example, for teachers of the gifted who have strong S preferences, it might be important for them to cultivate their N side when working with students who have this proclivity.

Finally, it seems important for all teachers to be aware of how gifted students may differ from their classmates in

cognitive style preferences so that these differences can be recognized and validated. It may even be worthwhile for teachers involved in professional development workshops to be made aware of how cognitive preferences relate to learning and teaching styles and how recognition of style differences may translate into more effective teaching for all students. These suggestions warrant further research to document exactly how the match or mismatch between a teacher and student may affect learning either positively or negatively.

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