

# *Learning and Motivational Characteristics of Boys With AD/HD and/or Giftedness*

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**ABSTRACT:** *This study compared the academic and learning characteristics of students with (a) Attention Deficit/Hyperactivity Disorder (AD/HD), (b) giftedness, and (c) giftedness with AD/HD, and examines specific a priori questions. The information reported by teachers, parents, and children was analyzed with a multiple-case design with constant comparative procedures within and across groups. The results indicated that giftedness conferred benefits related to specific talents but did not offer protection from the negative outcomes of AD/HD, such as inattention and homework problems. The learning and motivational profiles of each group were discussed in terms of implications for differential diagnosis and research and for teaching children with AD/HD and giftedness in general and special settings.*

ver half the children with Attention Deficit/Hyperactivity Disorder (AD/HD) who are taught in general education classrooms fail at least one grade by adolescence (Barkley, Fischer, Edelbrock, & Smallish, 1990; Brown & Borden, 1986), and over one-third fail to finish high school (Weiss & Hechtman, 1986). Intelligence is considered a protective factor in the long-term outcome of AD/HD (Barkley, 1990) and could moderate classroom outcomes. High intelligence (giftedness) might provide long-term benefits by allowing children with AD/HD to channel ac-

tivity constructively, to focus attention within talent domains, and to withhold responding until conditions were appropriate. Alternatively, high intelligence might allow these children only to compensate sufficiently to look average. Even less optimistically, intelligence could contribute to even greater expectations for children who may be already failing to meet school requirements. When we proposed to study the co-occurrence of AD/HD and intellectual giftedness, there were no previous data about the overlap and distinctiveness of these exceptionalities. There were studies reporting the learning characteristics of students with pure

AD/HD (for review see, Zentall, 1993) and with pure giftedness (Van Tassel-Baska, 1998).

To develop a framework for understanding students with these exceptionalities, we used both the optimal stimulation theory (e.g., Berlyne, 1960) and Dabrowski's Theory of Positive Disintegration (1964). The optimal stimulation theory states that all organisms have a biological need for stimulation, which is homeostatically regulated by the individual through activity. Prior work with students with AD/HD documented that these students were more readily understimulated (i.e., habituated to stimuli faster) than children without AD/HD, especially in familiar school contexts, during the performance of rote, long, or uncolorful tasks, and in settings that involved wait (for review see Zentall, 1975; Zentall & Zentall, 1983). Under such reduced stimulus conditions, they were more likely to generate stimulation through (a) verbal and motor activity, (b) impulsivity (difficulty delaying activity), and (c) attraction to internally-produced (daydreaming) and externally available stimulation (poor sustained attention and selective inattention). When we applied the optimal stimulation theory to students with AD/HD, we suggested that these students might also generate cognitive, social, and emotional (aggression) stimulation (see Meyer & Zentall, 1995; Zentall, 1993, 1995).

Preferences for type of stimuli might be an individual factor, but because Dabrowski (1964) theorized that individuals were sensitive to specific stimuli, we considered the possibility that there may be some basis to predict preferences. Although prior research has documented that children with AD/HD rely on kinesthetic and sensory types of stimulation, children with both giftedness and AD/HD might additionally rely on intellectual or creative ways to create stimulation—depending upon their specific talent domain (Gardner, 1983).

This study recorded the learning and academic characteristics of nine students with and without AD/HD, giftedness, and combined AD/HD and giftedness, as reported by three different participant sources—teachers, parents, and the children. It was also important to determine with which tasks and in which settings these students differed, because both giftedness

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and AD/HD are situation- and task-specific (i.e., students are not talented or AD/HD in all settings, time periods, or with all tasks). We also wished to determine whether a clear differentiation could be made between AD/HD and giftedness, because children with creative giftedness have been misidentified as AD/HD (Cramond, 1994). In addition to these descriptive comparisons within and across groups, we also examined specific a priori questions related to whether intelligence could be considered a protective factor in AD/HD.

## METHOD

### PARTICIPANTS

The participating children were drawn from a single school district in the Midwest, which provided self-contained classes for students with intellectual giftedness. In order to arrive at the targeted number of 9 children and their families, 21 boys were initially nominated for participation in the study by a school counselor and a coordinator of gifted and talented programs. Nominations were based on information in their school files, which included IQ, age, and gender (to create homogeneity with respect to age and gender and to establish a lower limit for IQ of 90 and for giftedness a lower limit of 126). Three children from this original pool were eliminated—one due to changes in medication status, one served as a pilot child, and one relocated to a different school district. The remaining 18 nominated students were sent

**TABLE 1**  
*Demographic Characteristics*

Group	GH			H			G		
	GH-1	GH-2	GH-3	H-1	H-2	H-3	G-1	G-2	G-3
Individual									
Age in months	100	114	115	126	105	102	117	105	108
CSI	136	141	134	110	109	90	134	131	141
CRS-R									
Mothers	0.7	3.7		2.6	1.5	2.4	-0.6	1.5	
Fathers	1.5	2.8			2.6	3.7	-0.8	0.3	
Teachers	2.0	1.7			-0.3	1.0	-0.6	0.8	1.4
SSQ-R									
Problems	1.25	1.67	1.31		0.74	0.89	-0.97	-0.74	.15
Severity	0.26	1.86	1.96		-0.37	0.28	-2.12	0.89	-0.12

*Notes:* CSI is the Cognitive Skills Index of the Comprehensive Tests of Basic Skills. CRS-R is the Conners Rating Scale-Revised, which has a teacher and a parent form. The scores reported are for the Hyperactivity Index, which are reported in standard deviations from the mean of average children. SSQ-R is the School Situation Questionnaire-Revised. Higher scores indicate more problems on both the SSQ-R and the CRS-R. Missing data, due to single parenting, busy teacher schedules, and difficulties contacting working parents, were coded as empty cells. This included missing data from the teacher of one student in the H group, who declined to participate, so the teacher interview, CRS-R, and SSQ-R data were missing for this case. Additionally, both single parenting mothers failed to return the parent CRS for one case in the GH group and one case in the G group, and the father data were missing from the cases with single parenting mothers.

information about our study and asked to participate. We selected the first three students from each group who returned signed permission forms. The mean age of the nine participating boys, as described in Table 1, was 9 years, 2 months (range 8 years 4 months to 10 years 6 months).

*Attention Deficit/Hyperactivity Disorder Only Group (H).* Three boys were clinically identified as AD/HD (H) by a community physician, who at that time had placed these boys on medication. The school district's identification procedure always included criterion scoring on parent and teacher checklists, which were reevaluated annually by a physician with a trial period without medication. The boys in this group were in three different general education classes in the same school district.

*Giftedness Only Group (G).* Three boys were identified as gifted (G) by a school-based, multiple criteria identification procedure, which included achievement and intelligence test data.

*Gifted and Talented-Attention Deficit/Hyperactivity Disorder Group (GH).* Three boys were identified as both AD/HD and gifted (GH) by a combination of these methods.

The six children identified with giftedness were enrolled in five different full-time self-contained classes, instructed by teachers with training in gifted education. This context was selected to control for the social/emotional problems (Webb, 1993) and AD/HD-like behavior (Baum, Olenchak, & Owen, 1998) typically associated with inappropriate educational environments for the gifted.

*Confirmation of Group Status.* To support the identification of giftedness, we examined scores on the Cognitive Skills Index (CSI; Comprehensive Tests of Basic Skills, Fourth Edition, published by CTB/McGraw Hill, 1986), a group intelligence test administered by the school district. The boys in the AD/HD only group scored in the average range on this group-assessed intelligence test with a mean CSI of 103 (range = 90–110). The mean CSI for the

boys in the combined group was 137 (range = 134–141); the mean CSI for the boys in the G group was 135 (range = 134–141). Both groups with giftedness were near the ceiling of the CSI; thus, these scores could not provide confirmation of high intellectual ability ( $IQ > 145$ ). However, recent Otis–Lennon Intelligence Test scores (Otis & Lennon, 1989) were reported for the G group ( $M = 126$ , range = 116–133) and the GH group ( $M = 143$ , range = 137–150), and provided evidence that one student in the GH group was highly intellectually gifted ( $IQ = 150$ ).

Although our participants with H had been previously identified by physician and school district procedures, were taking medication, and were annually reevaluated, we reassessed the current behavioral characteristics of the students identified as AD/HD by administering both parent and teacher forms of the Conners Rating Scales-Revised (CRS-R, Conners, 1997; Goyette, Conners, & Ulrich, 1978). Some data were missing; see Table 1. For the remaining children, the mean  $z$  score on the Hyperactivity Index of the Parent Form of the CRS-R of the children in (a) the GH group was +2.18; (b) the H group was +2.56; and (c) the G group was +.20. For the teacher ratings, the mean  $z$  score on the Hyperactivity Index of the CRS-R of the children in (a) the GH group was +1.85; (b) the H group was +.35; and (c) the G group was +.53.

In sum, both parent and teacher data confirmed the non-AD/HD status of the G group. The parent data confirmed the identification of AD/HD for both the GH and H groups, even though all six of the children were taking medication at the time of the ratings. The teacher data confirmed the presence of AD/HD for the GH group but only partially confirmed the AD/HD status in the H group. Interpretations of these latter findings are either that (a) teachers of gifted students have higher behavioral standards than do general educators and thus rate their students with higher scores, or (b) higher levels of activity and impulsivity are associated with gifted children at an upper range of intelligence (Shaywitz, Shaywitz, Jamner, Towle, & Barnes, 1986).

## DESIGN

We used a multiple-case design, due to its usefulness when the area of investigation is new (Moon, 1991), the issues are complex (Moon & Trepper, 1996; Yin, 1989, 1993), and the number of cases are too few for multivariate statistics (Yin, 1993). To enhance the robustness of the generalizations derived, we collected data using several methods (ratings, data in school files, and interviews) from multiple participant sources (Lincoln & Guba, 1985; Yin, 1989, 1993) and conducted our analyses at three different levels: individual case, within-group, and cross-group (Eisenhardt, 1989). As well, we used multiple investigators with different backgrounds and experiences to provide additional theoretical triangulation (i.e., to provide constant comparisons with the research literature; Eisenhardt; Moon & Trepper).

## DATA

Data were collected by a team of research assistants, who had prior experience interviewing (e.g., as a guidance counselor) under the supervision of two senior researchers, one of whom specialized in research on AD/HD (first author) while the other specialized in research on giftedness (second author).

*Interview.* One member of the research team conducted an initial 30–45 min interview/assessment session in the home with each parent separately in two-parent families and a follow-up 20–25 min interview with the student. At a later time in their school settings, teachers participated in 30 min semistructured interviews. A semistructured interview protocol had been developed, piloted, and revised in a prior year, with questions about learning preferences and perceptions of the child and school experiences. For the student protocol there were (a) five questions related to the students—their typical and good/bad days and their hobbies, aspirations, etc.; (b) six questions related to school assignments, activities, and teachers; (c) eight questions related to home and family learning activities, free time, rules, etc.; and (d) four questions about friends and joint activities. For the parent protocol there were an equivalent number and type of questions about the child

generally, his learning characteristics at home and at school, and family and friends. Similarly, the teacher protocol contained an equivalent number and type of questions related to the child and his typical good/bad day at school, his learning characteristics and activities at school and as homework, and his school relationships. Training of the interviewers was accomplished through (a) an interview manual (e.g., describing how to maintain neutrality, accept different perspectives, use follow-up questions); (b) observation of a senior researcher; (c) simulations in meetings; and (d) feedback from the senior researchers using transcriptions of pilot children.

*Ratings Scales.* Rating scales are the most widely used techniques to assess childhood psychopathologies (DuPaul & Barkley, 1992). As previously described, we asked mothers and fathers to fill out the parent rating scale form of the CRS-R, and teachers to complete the teacher form of the CRS-R. In addition, parents and teachers completed the School Situations Questionnaire-Revised (SSQ-R; Barkley & Edelbrock, 1987). This scale (see Table 1) derives number-and-severity-of-problem total scores, which are significantly associated with observations of visual on-task classroom behavior and percentage of work accurately completed (i.e., predictive validity; DuPaul & Barkley).

*Treatment of Data.* Multiple levels of analysis for all sources of data (Eisenhardt, 1989) were conducted by a team of two senior investigators and three graduate research assistants. At each level of analysis team members participated in meetings (peer debriefings, each 1-2 hr in length every 2 weeks for 3 years). The qualitative analysis was conducted at three levels. The first *case* level of analysis involved examining all data sources and methods of data pertaining to an individual child/family, using open and axial coding and constant comparative procedures (for procedural details see Moon, Zentall, Grskovic, Hall, & Stormont, in press), as recommended by Strauss and Corbin (1990).

When coding was completed, each analyst team member summarized the case with a theoretical memo, which combined available information from the data and from the transcripts (i.e., in response to interview questions, "What makes learning easy at school [or home]?"). In

peer debriefing meetings the team members discussed their observations in relation to (a) their individual open codes; (b) codes based on our a priori questions (e.g., intelligence, expectations); and (c) a combined list of categories derived from all the sources of data from two pilot children (axial coding). Team consensus regarding these codes and themes were written as methodological memos in the form of minutes of the meetings.

After we had conducted all three case analyses for a given group, we conducted separate, *within-group*, *cross-case* analyses of the three cases in that group for six major categories (giftedness/talents, family characteristics and parent perceptions, learning characteristics and teacher perceptions, activity/impulsivity characteristics, emotional/social characteristics, and stimulation and intervention preferences). Several kinds of data displays (Miles & Huberman, 1994) were used to facilitate comparisons of the cases within a group and the perceptions of the different sources (children, mothers, fathers, and teachers). As with the case analysis level, the final step at this level was a peer debriefing with a comparison of our findings to the literature (i.e., theoretical triangulation). With the six major categories and three groups (GH, H, and G), we conducted 18 within-group debriefing analyses at this level.

The final level of the constant comparative analysis was a *cross-group* analysis where the findings from the three separate within-group analyses were compared. Data displays, theoretical and methodological memos, and triangulation with the literature were used at this level as well.

In summary, at all stages we used accepted qualitative data analysis techniques to refine the analyses, develop explanations, and enhance the reliability and validity of the findings. These techniques included peer debriefings (Lincoln & Guba, 1985), theoretical memos (Strauss & Corbin, 1990), theoretical triangulation (Patton, 1990), pattern matching (Yin, 1989, 1993), investigator triangulation (Eisenhardt, 1989), data displays (Miles & Huberman, 1994), and comparison to the literature (Glaser & Strauss, 1967).

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## RESULTS AND DISCUSSION

We first addressed the question of whether we could qualitatively differentiate among the three groups of students in classroom and home contexts, as reported by different participant sources—teachers (t), mothers (m), stepmother (m<sup>s</sup>), fathers (f), and children (c). To this purpose we first reported what was common and then what differentiated among groups. Second, we addressed questions related to the role of intelligence (a) in compensating for the attentional and behavioral problems of students with AD/HD versus creating additional expectations for them, and (b) in the types of stimulation preferred (e.g., cognitive versus sensory). Finally, we included a section that summarized what the participants perceived to be effective in helping the children with exceptionalities successfully adapt to learning contexts.

## DIFFERENTIATING CHARACTERISTICS AND PERFORMANCE

### ATTENTION

In support of our original diagnostic procedures, inattention differentiated students with AD/HD (H, GH) from students in the G group. Complaints about attentional problems were reported twice as frequently for the H and GH groups as for the G group. Additionally, there was cross-informant (parent and teacher) agreement reported for problems in the AD/HD groups, but there were no problems reported by two sources for any child in the G group. Students with AD/HD failed to get onto the right track, and when on-track they consistently fell off-track. For example, the teacher of student GH-2 observed,

Sometimes he's kinda late...[and it] takes him a long time to get with what we are doing and

then he is all right for a while and then he just goes through spurts. His concentration span is very limited.

Specific problems related to falling off-track were losing interest, looking off-task, doing minimal work, and failing to edit, to complete homework or worksheets, or even to complete routines. For example, one father said, "Say he has been eating a hot dog. We may find it on his dresser or on the bathroom sink. He just forgets what he is doing, and it is really frustrating." Parents also observed that their children lost interest or talked "in the wrong direction" (GH-1m, GH-2f). Losing a train of thought was even reported by the children, as stated by H-2, "I was just trying to think. I just forgot. Comes through, stops, and then goes back out."

Failing to get on-track was seen in difficulties attending to, remembering, or following verbal directions—only for students with H and GH. For example, the teacher of GH-2 recounted that, "He does not listen to directions, he does not.... I think he definitely has to see them." Disorganization was spontaneously reported by a number of sources in the H and GH groups. It was manifested primarily at the beginning of a task or day in the form of difficulty getting started or procrastinating on projects or other assignments (GH-1fmc, GH-2; H-2t, H-3t). Also, for both groups with AD/HD, getting to school early or being prepared apparently set the stage for them, as stated by their teachers: "The day is going to start off poorly, because he is coming in and doesn't have his homework or forgets things."

From several teachers' and mothers' observations about disorganization, we learned that students with AD/HD, who save too many objects or hold too much information, may have difficulty organizing this greater quantity of physical objects or mental stimuli. For example, the teacher of H-2 said, "Orderliness and that kind of [thing] is not important to him.... His desk is a pig pen all the time; you know, we have to clean it about two times a week. He's a saver...he throws nothing away. He can't find anything...and he assures me that his room is like this too." With respect to mental organiza-

tion, the mother of H-1 said, “His mind can occupy several different areas at one time. I think that’s why he goes in so many different directions.”

For the GH students but not for the G students, there was convergent support from the SSQ-R rating scale in the number and severity-of-problem total scores (see Table 1). As well, there was consistent evidence that the attentional problems of the children with GH were even greater in prior years when these children were in general education classes (GH-1mc, GH-2c, GH-3cm). For example, the mother of GH-3 reported:

When he was in first grade he was in trouble a lot. Oh gosh, he was always standing on line.... That’s their discipline. They don’t get to play at recess. They stand on a line. He was bringing notes home on a daily basis that he was not listening. He was not paying attention.... And I was upset that they were sending these notes home.... They were pictures: happy face, straight line, sad face circled with his behavior... and he had to carry those home daily. It was terrible for his self-esteem.

Finally, as a caution in differentiating among disability areas based only on attention-related behavioral evidence, we found that one of the students in the pure gifted group, G-2, either had an undiagnosed attentional disorder or was experiencing similar difficulties concentrating due to situational stress related to his parents’ recent divorce and father’s subsequent remarriage. His teacher described the attentional performance of G-2 by saying, “I would say misbehavior is inattention...not being able to get done what he needs to do, or attend to what he’s supposed to do, or decide [if] it’s important.” This teacher further reflected on her own descriptions and said, “It makes me go hmmm...because he just carries so many characteristics that I would find in attention deficit.” These observations were not, however, supported by the number or severity of problems scores on the SSQ-R (see Table 1).

#### CLASSROOM PERFORMANCE

All three groups of students at this age had difficulties completing tasks requiring lower level skills, which may be characteristic of young boys

in general. There were difficulties reported for worksheets and for routine tasks and activities, especially if tasks were long or were timed (H-1c, H-2mt; GH-3t; G-1c, G-2tc, G-3m). For the students with H and GH, but not G, additional underachievement was described. For example, the teacher of H-2 said, “He’s certainly an average student—maybe a little bit above average. Definitely I think he has more capabilities, you know, than his work reveals.” In contrast, problems in school or with teachers were not reported for students with G, who also reported a general liking of school (G-1fm, G-3c).

*Handwriting.* At this age all students were learning to write, and slowing down for repeated practice was either disliked or difficult (H-1m, H-2t, H-3t; GH-1tm, GH-2t, GH-3t; G-1fmt, G-2t, G-3c). For the G group, handwriting was disliked, as stated by this teacher of G-1, “[He] absolutely detests handwriting.” Disliking handwriting could be attributed to the fact that it may have constricted and slowed down their thinking. However, for students with AD/HD there was a perception of greater difficulty—more in line with previous reports of poor visual-motor performance and poor handwriting reported for students with AD/HD (for review see Zentall, 1993). Teachers of each student with GH specifically described the physical difficulty of handwriting. For example, the teacher of GH-1 said, “Writing...physically writing, I think, is difficult.” For the pure H group, the physical difficulty of handwriting was also spontaneously reported by the general educator of each child, but it was additionally described in a context of trying to work too fast, as stated by the teacher of H-3: “He has pretty poor penmanship and he’s pretty quick and does things too fast.... He thinks faster than he writes, makes it difficult.”

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*Reading and Language Arts.* Commonalities were found in reading performance across the two groups with AD/HD, who complained about the boredom of some reading activities (e.g., long, boring books). Teachers and parents reported that children from both groups also had difficulty getting started on reading from texts, although once started they might proceed well (GH-1tf, GH-2f; H-1m). For example, the teacher of H-3 said, "If you ask him to read a paragraph and answer comprehension questions from it, eh, that's boring." Even though there were specific complaints about reading, both AD/HD groups also reported that reading made learning fun.

However, reading skills differentiated pure H from the GH group. Teachers of students with pure H (H-2 and H-3) described specific skill deficits in phonics and word attack: "Reading is not real easy for him, though. He has some difficulty with word attack skills." In contrast, there were no reports of being a poor reader for students with GH (or G). The closest statement to that effect was made by the teacher of GH-1, "He's also a slower reader, though a very good reader."

Language arts difficulties were reported for planning, writing, and editing for children in the AD/HD groups (H-2c, H-3m; GH-2c). For example, the teacher of H-2, "In terms of writing stories or paragraphs for language, he doesn't want to do any of the steps we go through with the preplanning. He never wants to edit; he never sees the importance of editing."

*Math and Science.* Math was more likely to set groups apart than to provide common ground. Math was not reported by any participant in the G group as making school difficult, and math problem-solving was reported as making learning fun or easy for students with giftedness only (G-1cfmt; G-2). However, for students

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with AD/HD, there were reports about math both pro (H-1m, H-2tmc, H-3mfc; GH-2f) and con (H-1c, H-2ct, H-3c; GH-1mt, GH-2tc, GH-3tc), often for the same children. This apparent ambivalence appeared to actually be due to the way math was presented. The teacher of GH-3 described a hypothetical bad day as one in which, "He had to sit in his seat all day and was asked to do worksheet after worksheet, math problem after math problem." Most of the children with H and GH were motivated by math, as long as the assignments were graded by the teacher and were not (a) too long or too easy, (b) mixed operations, or (c) routine problems placed on the board.

However, for both groups there also were deficits in math related to rote task requirements. As stated by the teacher of GH-3,

He's really poor at math. And the reason that he struggles so is...that he hasn't memorized or doesn't know his multiplication or division facts. He's to the point now where [we are] reducing fractions to the lowest terms and [doing] those kinds of activities where he needs to apply his facts, and he doesn't have it and can't do it.

These observations are consistent with prior quantitative group-comparison research (for review, see Zentall & Ferkis, 1993). Specific problems in science were reported only for the H group and appeared to be due to the need to wait, work independently, or read from textbooks.

*Art/Gym/Music (Specials).* Problems with specials were reported only for the pure H group, which are consistent with teacher reports in group research (Zentall & Stormont, 1995). One teacher described H-2 this way:

It was at the end of gym, and we were getting ready to get lined up....He was coming in across the gym and he just came sliding across the floor. That wasn't weird in itself at all...you know, he'll just shake his head and his hair will be flying all over and making goofy sounds, and everybody's looking at him. But it's just like, ha, I've got the release.

Similarly, the teacher of H-3 said, "[In specials he doesn't do] as well as he does in the general education classroom. He's been sent to

the office a lot. I'm not really sure what for, but we have a 45-min art period, and he is probably in the office 50% of that time." These difficulties were reported for H-3 in art, even though his general education teacher reported that he liked to draw, to build, and to do hands-on activities.

#### *HOMWORK PERFORMANCE*

Only students with AD/HD (H-1c, H-2tc, H-3tmc; GH-1tc, GH-3t) had difficulties with homework (especially "a pile of homework") and long-term projects, which often required homework (H-1m, H-2m; GH-1mtc, GH-2f). Students in the GH group were described as either not doing the homework ("He doesn't do homework. He's very irresponsible."), or as working hard at school to avoid taking it home ("He absolutely hates homework, so he works very hard at not having homework."). GH-1 spoke about how overwhelmed he felt when he had too much homework: "This uncanny homework. It's just usually I do not get my work done.... In September the homework was taken over on me." His teacher similarly reported homework problems:

Especially when he was not taking Ritalin. I would try to check (His homework), because he'd simply dash out the door without thinking about anything. So a verbal check was often helpful. And when off medication, he did miss assignments. He just wouldn't take it home, or wouldn't think about it, or he'd lose it...and his grade suffered because of that.

But when he was on medication, "he was almost fastidious about making sure things were done. And then he was very tense and stressed...he would burst into tears 'cause it was all just too much. So that stress level wasn't good."

#### **THE ROLE OF INTELLIGENCE**

We originally set out to explore several questions related to the role of high intelligence for students with AD/HD in (a) altering the types of stimulation preferred, and (b) compensating for their attentional and behavioral problems versus creating additional expectations for them.

#### *STIMULATION PREFERENCES*

Even though all the students with AD/HD were taking psychostimulant medication, we were able to find preferences for type of stimulation. Students with H presented consistent evidence of preferences for concrete sensory stimulation (visual arts, H-1m, H-2m, H-3t) and for social and activity-generated stimulation (sports, building things, H-1c, H3t). Although creativity was not elaborated, all three students preferred creative activities. For example, both H-2 and H-3 were described as loving to draw. Only H-1 had a profile that was similar to that of our GH participants (i.e., high levels of imagination and visual spatial talent, see Table 2). None of the students with pure H had identifiable academic talent. However, H-3 was described as a computer whiz.

Students with GH also were engaged in sports and social activities, but they also consistently preferred cognitive and language-based stimulation (e.g., telling stories, imagination, dramatics). The teacher of GH-1 provided an example of imagination:

But at times when he's not on medication I really have to watch him.... He has a whole imaginative thing going on inside his head, just play—I think there must be another world there that goes on 'cause you'll see him swooping his hand this way or that way and you know he's not with me, he's somewhere else.

Students with GH demonstrated creativity through humor, creating games, assembling ideas or things in novel ways, and imaginative expressions. GH-1 and GH-2 had dramatic talent, which was played out indirectly with figures or directly through role-playing (e.g., as secret service agents). GH-3 had clear talent in costume design. Students with GH were described as having vivid imaginations and visual art talent (e.g., drawing, building, carving, and making paper sculptures). Overall, students with GH seemed to shine more in the creative areas than in the academic areas in comparison to the G group. These conclusions are consistent with findings that more gifted children than would be expected by chance, who also met the rating criteria for AD/HD, were placed in a highly cre-

**TABLE 2**  
*Data Display Summarizing Talent Areas and Interests*

	<i>Very Low</i>	<i>Low</i>	<i>Average</i>	<i>High</i>	<i>Very High</i>
<b>Reading</b>					
G			G-1	G-2	
GH				GH-1, -2, -3	
H		H-2, -3			
<b>Language Arts</b>					
G			G-1, -3	G-2	
GH			GH-2		GH-1
H		H-2,-3		H-1	
<b>Math</b>					
G				G-2	G-1
GH		GH-3	GH-2		GH-1
H	H-1		H-2, -3		
<b>Science</b>					
G				G-1, -2	G-3
GH				GH-1, -2	
H			H-2, -3	H-1	
<b>Spatial/Mechanical</b>					
G				G-1, -2, -3	
GH				GH-1, -2, -3	
H				H-1	
<b>Visual Arts</b>					
G				G-3	
GH				GH-1, -2, -3	
H			H-2, -3	H-1	
<b>Drama</b>					
G				G-2	G-3
GH				GH-2	GH-1
H					
<b>Interpersonal</b>					
G		G-3		G-1, -2	
GH				GH-3	
H					
<b>Creativity</b>					
G			G-1		G-2, -3
GH				GH-2	GH-1, -3
H				H-1	

*Note:* The gifted (G) group is listed on the top row, the combined (GH) group is listed in the second row, and the AD/HD (H) group is listed in the third row within each talent area for readability purposes only. Placement of cases on this scale was based on a consensus of team members during peer debriefing during cross group analyses, using all participant sources of data. If a case is not listed for a particular talent area, there was insufficient evidence to make a scaling judgment for that case.

*In contrast to the reported talents and preferences, there was evidence that high intelligence made some of the problems of students with AD/HD more apparent.*

ative subgroup within a gifted school program (Cramond, Gollman, & Calic, 1994).

Students with GH also demonstrated preference for cognitive stimulation through activities related to their academic talents or learning- and social-skill areas. As stated by the teacher of GH-1, "He's so talented in many areas. I mean his mathematics he does completely in his head and so easily and so well." GH-1 could also put ideas together exceptionally well and GH-3 had a large knowledge base. Students with GH also had interpersonal facility with adults (i.e., social intelligence). For example, the teacher of GH-1 said, "And he's delightfully funny. He's got a great sense of humor."

Dramatic talent was also in evidence for the G group. G-2 and G-3 both loved fantasy and were imaginative. G-2 was the most talented in the verbal area—he loved reading, poetry, and telling stories; G-3 was most talented in dramatics and was the only G student who also had artistic talent. G-1 was the least creative, especially with written composition. However, he had a sense of humor, and there was evidence of creativity in mathematical and scientific problem-solving (see Table 2).

#### EXPECTATIONS

In contrast to the reported talents and preferences, there was evidence that high intelligence made some of the problems of students with AD/HD more apparent. Their teachers reported discouragement in working with them (in comparison to students with giftedness) and described them as not being "good" students and having poor "work ethics." For example:

(GH-2] has had a lot of problems this year as far as getting things turned in on time, completing assignments...his grades have suffered a great deal because he hasn't turned in anything.

He appears to be very capable.... He usually isn't in line when he is supposed to, not ready when he is supposed to be; he doesn't have the things he needs. I mean he never has the supplies he needs. Never can find a pencil, never can find a pen, never.

These educational problems were observed even though the children were apparently receiving a curriculum adapted to their intellectual and academic abilities and even though each student in the GH group was taking medication. If there had been no adaptations for advanced ability, the adjustment to school would probably have been worse, as indicated by the father of GH-2 about a prior school year in a general education setting:

Second grade was a disaster. The teacher was not very flexible at all. She decided that if he could not do the work that was very easy, that he would never be able to do the work that was hard. Now that was her philosophy and he got nowhere, so we switched schools after that.

Dysynchronous expectations were also perceived by these students even at this young age, and were a source of emotional stress for them. For the report on the social/emotional and family characteristics of these participants, see Moon, et al., in press). In other words, GH students were aware of their teachers' displeasure and were able to articulate the discrepancy between expectations and performance. For example, the mother of GH-3 stated, "He'd say, 'Mom, if I'm not paying attention, if I'm not listening, how did I get all the answers right?' Which I thought was very logical for a 6-year old."

#### LEARNING PREFERENCES

##### ALL CHILDREN

Overall, there was consensus for all the students in that science was the most preferred, especially when there were experiments or projects. Learning also seemed easier or more fun when it involved the use of high-interest content, such as space or science fiction.

The single most often selected learning activity across all groups was computers, as stated

by the teacher of H-2: "He loves the computer. He loves to do that." There were also cross-group preferences for other hands-on types of activities, such as drawing, building, art projects, and games, as stated by the teacher of GH-3: "He naturally likes to do hands-on activities." Active participation outdoors and verbally in class were also highly preferred across groups. Types of reporting methods preferred were verbal responding, performing, or enacting plays and fantasies.

The most helpful motivational strategies reported for all three groups of students at this age were teachers who gave students individual attention and took personal interest in them. The importance of teachers' caring behavior has also been reported for children with behavioral problems (Morse, 1994). For all groups and sources there were reports of the importance of teacher efforts to increase structure, such as breaking down and writing assignment steps, checking assignments, and providing additional examples or cues (e.g., charts, schedules, study guides, answer sheets, and sample problems).

Prior group research has reported that increased structure, defined as specificity of response requirements, has similar effects on the behavior of students with AD/HD as it does on their classmates (Madan-Swain & Zentall, 1990; Zentall & Leib, 1985). Even though the effects are similar, students with AD/HD may need more response specification, especially in unstructured, working group contexts, as stated by the educator of H-2:

We do several things where we work in pairs or small groups. And he has trouble with that when the structure is not quite as, you know...it kind of depends on the partner.... The other day when we did a social studies activity, an assembly line kind of a thing, I was kind of surprised, because he worked very well with that.... And they just basically assigned the different tasks that this project involved. He had no problem with that at all.... He understood exactly what this person wanted him to do.... And he did it quite well.

#### STUDENTS WITH AD/HD

For the six children with AD/HD there were preferences in social studies or history related to studying specific content (explorers or Native Americans) and to learning new things. These students' preferences also depended on the lesson directions or learning activities, as stated by the teacher of GH-1: "Science, if it's an activity—sometimes is good; it depends on how much he has attended to the directions.... Is it animated?... That would do it for him." Thus, while specific content and animation might be preferred by all children, students with AD/HD might be counted on to attend only under such highly stimulating conditions. Such conclusions are consistent with the optimal stimulation theory.

#### *Group Versus Solitary Learning Activities.*

For both groups with AD/HD, we also found consistent evidence of preferences for group learning activities that had social stimulation (e.g., participation). Students with H and GH preferred group learning and opportunities for discussion. If the student were GH, he might have been aware that certain tasks might be performed better alone, as stated by GH-1: "If I have to work by myself, if it's my fantasy story, it's okay." In contrast, the pure G group more generally preferred to work alone, unless it was more efficient to share a project by dividing up the tasks. These findings are consistent with the preference literature for working alone for gifted students (Baska, 1989) and for working with others for students with AD/HD (Zentall & Stormont, 1995).

Although students with AD/HD preferred participatory learning experiences, teachers were very direct about how difficult these group situations were for these students and their classmates to manage. Teachers of H students observed that participation in group settings was

*The most helpful motivational strategies reported for all three groups of students at this age were teachers who gave students individual attention and took personal interest in them.*

associated with bossiness, high sociability, non-task-oriented, or overexcitedness (e.g., behaving strangely, or not thinking well). For example, the teacher of H-2 reported, "I think maybe...when somebody does give him their full attention, he just goes crazy." Teachers of the GH group attributed some of these unsuccessful group experiences to students not carrying their load, which may have been more apparent in self-contained settings where students typically maintain consistent efforts (Webb & Latimer, 1993). GH-2 stated this himself when he said: "When I am standing around working, I just all of a sudden back out and just go free. They are doing all of my work." Although this behavior gives the appearance of poor effort, King (1993) found that those low-achieving students did not have confidence in their ability to be contributing group members and masked this lack of confidence with low effort. For students with AD/HD, behavior that might be characterized as irresponsible could similarly mask lack of confidence in group skills.

Not only does the group behavior of students with AD/HD have the appearance of low effort, but it also appears to be an attempt to get social attention. These students typically do receive social attention as a consequence of their activity, but it is equally possible that active participation was the desired goal. Both are documented in the following teacher's description of H-3:

He wants a lot of attention, and he gets it negative or positive. The continuing problem, I think, is the talking out without raising his hand. A lot of times that's just because he's excited about what's going on or really wants to be called on. I think the biggest thing is he's a child in need of attention. He doesn't know what is an appropriate way to get it.

In contrast to the preferences of all students with AD/HD for small group participation (which differentiated them from the G group), in large groups teachers thought students with AD/HD either participated too little (GH) or excessively (H). For example, the educator of H-3 said: "I'd say (He works well in) large groups if he's participating, but sometimes if he has his hand up and wants to participate and I'm

calling on other children, he'll get mad because I'm not calling on him." These differences may be attributable to differences between teachers and settings (gifted vs. general education), which included differences in teachers' expectations, instructional methods, and comparisons with other students.

*Motivation and Management.* Teachers' efforts to increase motivation for students with AD/HD included opportunities to be engaged in helper or leadership roles, as stated by the educator of H-3: "He works better in a group that he's in charge of, not a group where somebody else is the leader.... I give him those opportunities to help other people—to be in the high lights.... There are times when I give (Him) something to do or appear to help and he is wonderful." She also commented that, "His best way to learn is by reteaching it to somebody else." Teachers of students with AD/HD also used motivational techniques of reducing assignment length and changes in the work environment (e.g., working at the teacher's desk). In addition, there were frequent reports for the GH group of using preferred activities as incentives—work first and then choir, gym, more recess, sharing time, soft drinks, movies, or parties.

*Monitoring School and Home Performance.* General educators of students with H were aware of the importance of monitoring comprehension of directions, as stated by this teacher:

One of the biggest things with him that I've found does help is, it helps me understand what he's not understanding or if my directions aren't clear.... After I've given directions, then oftentimes I'll walk to him [and say], "Now, you explain to me, what do you think you should do here?"

Parents were similarly aware of the importance of monitoring comprehension rather than the appearance of attention, as stated by the mother of H-1: "He can, however, be in the same room, and you can be teaching him something, and he can be doing something else...but he will know exactly what you're saying, because you can question him on it and he'll be able to give you the answers." In helping their children with directions, fathers reported getting their child

started, giving additional attention, and showing their child how to figure things out. Mothers reported a wide variety of techniques (e.g., reading or writing for their children, giving them activity breaks between assignments, using incentives, choice, and discussions).

Often the children with AD/HD were aware of specific problems and requested support from parents and teachers in writing for them, asking them to underline important things, telling them more about the directions, using tape recorders for directions, reminding them, and having checkpoints. Two of the three children in the H group were also aware of their preferences for getting feedback on what they had done (e.g., self-correcting tasks). Preferences for shorter assignments and for doing homework during MTV or during commercials were probably attempts to deal with problems in sustained attention.

Parent/teacher communication and asking parents to check and remind students were observed to be useful strategies for dealing with disorganization in both AD/HD groups and were considered critical for homework. Mothers reported communicating with the teacher (e.g., to get assignments cut down). Teachers similarly reported:

I give homework just about every night, except Friday night, about 20 to 30 minutes of homework every night. I'd say out of 4 days he might not have his homework once or twice, but it'll come back the next day. I'll write a note in his assignment book, and his parents will make sure it's in his bag.

When teachers failed to communicate with parents early enough, a bad situation became worse, according to the mother of GH-1 when describing a previous teacher in a nongifted classroom:

I felt like he was just a problem, and she (His teacher) just didn't want to deal with it. It was just like 'do something about him!'.... But I didn't even know there was a problem until the first grading period.

In terms of ineffective strategies, teachers and parents consistently reported taking away activities (e.g., keeping students after school, out of recess). This strategy often made the situation more negative, especially for children with GH.

For example, the teacher of GH-3 said, "He generally makes up excuses for why he hasn't done this. And it's an endless battle between the two of us. He misses recess. He misses lunch recess." The mother of H-2 reported similar school experiences: "Sometimes he has a hard time staying on task and getting his school work done. So the teacher...kept him in at recess. And that didn't seem to really do any [Good]; it didn't help him to do it." Similar problems were reported when parents used these strategies at home, as stated by the father of GH-2:

Like one day I asked him to clean his room—this beautiful sunny day—and he didn't. So he stayed in that room until he finished. He never did; missed the sunny day, and the room was twice as messy as when he started.

Explanations derived from the optimal stimulation theory suggest that withholding activity further reduces stimulation, making it harder, not easier, for the child to complete nonmeaningful and nonchallenging tasks.

The children also listed some ineffective strategies, that is, those involving punishment, yelling, or restricting movement during class time (H-1mc, H-2c, H-3c). Although withdrawing activities or using punishment were both considered ineffective for reducing excessive activity and for improving academic production, withholding activity might be used as punishment for severe behavioral infractions (e.g., fighting), as articulated by GH-1: "Miss H. had more reasons to lose recess...and I wasn't having much recess.... With running in the halls that would lose me my recess. Miss D. doesn't have that rule. Her rules are no fighting and stuff."

## CONCLUSION

In this study, we wanted to determine whether we could qualitatively differentiate among the overlapping exceptionalities of G, GH, and H. We also raised several questions related to whether teachers and parents might have difficulty forming appropriate expectations for children with divergent abilities/disabilities and whether there might be specific benefits of intelligence in long-term outcomes. In providing conclusions related to these purposes, we recog-

nize that there were limitations of this study. These included the small number of participants and some missing data. Additionally, we did not identify an additional GH comparison group in the general education context. Future research will also need to determine whether the commonalities we reported across the three groups at this young age (e.g., active learning) would be similar for children without exceptionalities and whether the commonalities and differences among groups would also be found for girls, for children at different ages, and in a range of school districts. Our generality was improved mainly by relating our findings to the extant literature on students with pure giftedness or AD/HD. Our internal validity was improved by including three groups that were homogeneous (white males, ages 8 to 10), studying students in educational contexts appropriate to their ability levels, using well-trained interviewers, analyzing data in-depth in three stages, using literature comparisons and peer debriefings, as well as, by triangulation of: (a) method (ratings and interviews); (b) parent, teacher, and child sources; and (c) researcher expertise (AD/HD and gifted).

#### *DIFFERENTIATING AD/HD FROM PURE GIFTEDNESS*

Examining differences between students with G from those with AD/HD (H and GH), we had to account for commonalities for each of our groups at this age in liking of science and specific learning activities (e.g., computers, building and art projects, and verbal responding) and in disliking routine tasks and lower level practice skills (see Table 3). However, the differences we found between pure giftedness and GH were in evidence in spite of similarities in setting and in IQ. The commonalities that we report between H and GH groups were found in spite of differences in types of classroom placements (general education and gifted self-contained settings).

*Academic Performance.* Both groups with AD/HD (H and GH) were generally described as underachievers. They also had specific difficulties with (a) getting started with reading that was long or boring (e.g., from texts), but not with free reading; (b) math, especially when it involved long, easy, or repetitive exercises of

memorizing facts (e.g., worksheets) or readjusting to changes of operation signs in mixed problems, which is consistent with group comparison research (Zentall & Ferkis, 1993); and (c) handwriting, which was observed to be physically difficult at this age and performed too quickly. Poorer visual-motor test performance and the requirements for repeated motor responses that contribute to poor handwriting have been well-documented for students with AD/HD (for review see, Zentall, 1993). However, the specific findings related to reading (directed versus free reading) for both groups have not been previously documented.

*Inattention.* Our findings, as expected, were that inattention clearly differentiated between groups with AD/HD and students with G. Some of the inattention reported for students with H and GH was related to getting on-track—attending to and following verbal directions, planning and organizing, and in getting started (on the day, text-based assignments, and routines). Other problems were related to falling off-track—not sustaining attention or work production, losing things, specific memory problems, and not staying with routines or long-term home or school projects. These findings are consistent with earlier work examining the attention and organizational abilities of nongifted children with AD/HD (Zentall, 1993; Zentall, Harper, & Stormont, 1993). Because students with GH were provided with a curriculum appropriate for their giftedness, their inattention and its effects on academic functioning did not appear to be attributable to lack of challenge. New findings suggest that some problems with organization could be attributed to the quantity of objects, projects, or thoughts that the children with H and GH tried to hold and manage.

*Learning Preferences.* To differentiate groups through learning preferences, we present novel data that both groups with AD/HD consistently disliked or hated homework. If the student were GH, he might not do the homework or might work hard (albeit carelessly) to complete homework at school in order to avoid taking it home. The fact that students in the G group were relatively free of problems with inattention and homework suggests that the prob-

**TABLE 3**  
*Thematic Summary of Findings*

<i>Group-Differentiating Findings</i>	<i>Groups</i>		
	<i>H</i>	<i>GH</i>	<i>G</i>
<b>Classwork</b>			
Overall underachievement	H	GH	
Adjustment difficulties greater in general education		GH	
Difficulties in art, gym, and specialty subjects	H		
Specific difficulties with homework and long-term projects	H	GH	
<b>Attentional Problems</b>			
Attending to and following directions	H	GH	
Completing worksheets, routines, a train of thought	H	GH	
Disorganized, especially at the outset of a task or a day or with multiple objects or thoughts	H	GH	
<b>Reading/Writing/Language Arts</b>			
Difficulty getting started reading from texts	H	GH	
Basic reading skill-deficits (phonics)	H		
Resistance to planning/writing/editing	H	GH	
Working too fast and carelessly	H	GH	
Physical difficulty of handwriting	H	GH	
Dislike of handwriting and long or timed worksheets	H	GH	G
Enjoyment of free reading	H	GH	
<b>Math/Science</b>			
Difficulty with long math worksheets and easy or routine math problems	H	GH	
Enjoyment of math problem-solving			G
Enjoyment of space and science fiction content	H	GH	G
Enjoyment of science projects and experiments	H	GH	G
<b>Learning Preferences</b>			
Structure (e.g., study guides, checklists, cues, schedules, sample problems)	H	GH	G
Active responding (e.g., draw, build, use computers, enact plays, talking)	H	GH	G
Social studies content (Native Americans, learning new things)	H	GH	
Working with others	H	GH	
Working alone			G
Liking school			G
Challenge, pressure, competition, and use of memory		GH	G
Cognitive stimulation (e.g., humor, dramatics)		GH	G
<b>Stimulation Preferences</b>			
Social and kinesthetic (e.g., sports)	H	GH	
Visual/spatial (e.g., acting, drawing, computers)	H	GH	
Cognitive and language-based (e.g., telling stories, humor, dramatics, specific talent domains)		GH	

*Notes:* H = children with attention deficit /hyperactivity disorder; G = children who are gifted; GH = children with both exceptionalities. An empty group designator (H, GH, or G) indicates no problem or preference data reported for this group.

lems observed for the GH group were probably attributable to their disorder.

The H and GH groups (but not the G group) also expressed clear preferences for high interest content (e.g., space, science fiction, and explorers), learning novel things in social studies, and free reading (reported more often for the GH group), which have not been previously reported. Students with AD/HD, but not G, also reported preferences for participation and for working with others. This finding supports outcomes from group research with students with AD/HD (Zentall & Stormont, 1995), but has not been previously reported for students identified as GH. Furthermore, all the students with AD/HD preferred working with others, even though they apparently did not know how to achieve social and participation goals in their group settings.

#### *CHARACTERISTICS ASSOCIATED WITH GIFTEDNESS—THE ROLE OF INTELLIGENCE*

Preferences for challenge, pressure, competition, and the use of memory made learning easy and enjoyable for both groups of students with giftedness, but not for students with H. Differences between the H and GH groups can also be found in specific skill deficits and talents, which were unlikely correlates of class placement. In skill deficit areas, only students with H had no academic talents identified and were reported to have word attack skill problems in reading, which is consistent with the literature (for review, see Zentall, 1993).

However, class placement may contribute to the fact that only students with H, but not GH, had problems in science or the specials (art/music/gym). Students with H presented management problems to teachers in their special subject areas, even though they might have interest or skill in those areas (e.g., art). Problems in specialty subject areas have been previously reported by teachers in group research (Zentall & Stormont, 1995) and may be related to the requirements for waiting, following directions, or working independently in the absence of accommodation in those settings. Future research is needed to examine these specialty subject areas.

In contrast, the student and parents in the GH group reported more problems in their prior placements in general education settings. Although there may be a number of contributing factors for these reports, there is evidence that gifted students spend from one-fourth to one-half of their time waiting for others to catch up in general education settings (Webb & Latimer, 1993).

## **IMPLICATIONS FOR PRACTICE**

### *DIAGNOSTIC IMPLICATIONS*

Even though there were overlapping characteristics, which could lead to misidentifying children with creative giftedness as AD/HD (for review see, Cramond, 1994), the differentiating markers of students with pure G were reliable reports of (a) liking school, (b) liking math (although one student with GH had talent in mental mathematics), and (c) preferences for working alone. Preferences for working alone had been previously reported for gifted students (Baska, 1989). We also found that intellectual giftedness when associated with AD/HD did not offer protection from outcomes of (a) failing to produce relative to expectations (underachievement); (b) starting and organizing assignments; or (c) sustaining attention and work action to routines, long-term projects, and homework. These differences between the G and GH groups are particularly clear because these students were placed in the same self-contained settings.

Even though intelligence did not appear to confer benefits more generally, students with GH did enjoy challenge and had specific academic, learning, social, and creative talents, which could improve their long-term outcomes if these talents were developed. Furthermore, these talent areas could provide a more useful direction for predicting outcomes for these students than the commonly used global measures of IQ or achievement (Leroux & Levitt-Perlman, 2000). That is, these specific talents may increase the attentional focus and persistence of students with GH in specific areas of interest and could compensate for some of their overall attentional and organizational problems—in the same way

that specific academic areas of disability (e.g., specific reading disabilities) could contribute to less successful classroom functioning for students with H (i.e., in the absence of educational intervention).

We also point out new information that differences in intelligence may contribute to differences in preferences for type of stimulation. Even though students with both H and GH had strong preferences for social and kinesthetic stimulation, students with H had stronger preferences for sensory stimulation, which was primarily visual (e.g., the arts, computers). These preferences and skills may be underrecognized. The co-occurring group preferred cognitive stimulation as demonstrated by their (a) academic talents (e.g., mental mathematics); (b) learning abilities (e.g., preferences for challenge, problem-solving, memory); (c) creative talents (e.g., dramatics, story telling); and (d) social skills (e.g., humor, assertiveness, independence skills). Longitudinal research could determine whether the talent and interest areas described, especially for students with GH, could improve their long-term outcomes. Piechowski and Colangelo (1984) theorized that preferences for a combination of emotional, intellectual, and imaginal stimulation have the greatest potential for positive outcome. Unfortunately, the emotional maturity of students with GH does not appear to be at the same level as their intellectual and imaginal talents, which may contribute to social/emotional adjustment difficulties (Moon et al., in press).

#### *EDUCATIONAL IMPLICATIONS*

For children with both exceptionalities, science, especially when it involved experiments and projects, was a favorite subject in early elementary school. The children also preferred verbal participation in class and active involvement via computers, drawing, building, art, games, and enacting plays/fantasies. The most helpful motivational strategies reported by and for our students with exceptionalities were teachers who gave students individual attention and took personal interest in them, similar to reports for children with behavioral problems (Morse, 1994).

Students with GH had greater ability than students with H articulating what kinds of tasks,

teachers, and activities they did and did not like. Their assertiveness and ability to negotiate may confer long-term benefits for these children. However, all the young children with AD/HD were able to tell us what tasks and learning conditions they liked and what helped them learn. They reported strategies related to changing class and homework assignments, such as shorter assignments, writing for the child, asking the child to underline important things, telling them more about or using tape recorders for directions, reminding them, having checkpoints, and providing feedback or self-correcting tasks. We suggest that asking children questions such as, "What makes learning easy (or difficult) for you at school?" can be helpful in designing instruction for children.

Teachers employed a number of strategies that they considered effective for students with AD/HD. These included opportunities for the students to be actively engaged in helper or leadership roles, monitoring comprehension of directions, varying the work environment or method of reporting (e.g., handwriting vs. computers), reducing assignment length, monitoring progress on long-term projects, increasing parent/teacher communication, or using incentives of work first then preferred activities. Ineffective strategies reported by teachers (and parents) were reported to be those that involved taking away or withholding activity (e.g., recess, outdoor play) or punishing activity (e.g., by yelling).

Teachers of gifted students also reported a number of strategies that were effective. These strategies appeared to be cognitive in nature (e.g., encouraging questions, getting the child to think or outline, providing choices of challenging topics, reporting methods, or response

*Unfortunately, the emotional maturity of students with GH does not appear to be at the same level as their intellectual and imaginal talents, which may contribute to social/emotional adjustment difficulties.*

modes). These teachers were facilitating the creativity of the GH children by helping them compensate for handwriting difficulties through the use of the computer.

Other educational implications are related to what educators might inadvertently choose to do that would be detrimental, given the specific learning and motivational styles that we profiled for students with AD/HD. First, because children with AD/HD have greater difficulty starting tasks and organizing their work, teachers might be tempted to give them assignments that were more rote/repetitive in nature, and that would provide few opportunities for expressing creativity or for developing self-direction or organization. However, our findings indicated that teaching these students how to simplify, breakdown, or categorize assignments, projects, materials, and ideas, and then providing checkpoints along the way would be more effective. Second, it is possible that educators might naturally exclude children with AD/HD from group situations if their behavior became overly excited or off-task in those settings, rather than understanding the motivational potential of this apparently off-task behavior (i.e., socialization as a preferred activity). To improve achievement motivation in these settings, educators could include elements of play (i.e., exploration) or high interest topics (e.g., science fiction). Future research will need to assess the effectiveness of some of the learning and motivational strategies that we have reported.

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