

Gifted or ADHD? The Possibilities of Misdiagnosis

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This research intends to provide empirical support for the possibility of misdiagnosis of giftedness and Attention Deficit Hyperactivity Disorder (ADHD). Forty-four graduate students enrolled in a school counseling program acted as participants. Participants were given one of two forms, both of which provided a hypothetical case study of a young boy with characteristics of both giftedness and ADHD. Participants were then asked for a diagnosis. A chi-square analysis suggests a statistically significant difference whereby the suggestion of the diagnosis of giftedness can lead participants away from a diagnosis of ADHD. Implications for educators and graduate level counseling and psychology programs are provided.

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Although the prevalence rate for Attention Deficit Hyperactivity Disorder (ADHD) is estimated at 3 to 5% in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR*; American Psychiatric Association, 2000), indirect evidence often suggests that it is currently diagnosed at a higher rate. For example, ADHD is one of the most common reasons children are referred to mental health professionals (Brown, 2000). The prescription of stimulant medication, which is frequently used to treat ADHD, has significantly increased over the past decade (Ghodse, 1999; Olfson, Marcus, Weissman, & Jensen, 2002). Further, it is not uncommon to hear of the misdiagnosis of ADHD, wherein a child's behaviors are attributed to ADHD when in actuality they are caused by or related to some other condition or trait (e.g., Perry, 1998). One such trait is superior intellectual functioning, or giftedness (Lawler, 2000).

Children with ADHD and children who are gifted often engage in similar behaviors. According to Webb and Latimer (1993), both groups often possess high activity levels, have difficulty paying attention, act without much forethought, experience problems persisting on certain tasks, and have difficulty following rules. Both groups also often experience significant social difficulties and academic underachievement (Guenther, 1995; Leroux & Levitt-Perlman, 2000).

It is common for diagnosticians to use behavior checklists when investigating the possibility of ADHD. When these checklists are relied upon, rather than used as one piece of evi-

dence among other sources, the possibility of confusing ADHD for giftedness increases (Baum & Olenchak, 2002). Behavior checklists address only the expressions of behavior instead of the causes of behavior. Although the behaviors of children with ADHD and children who are gifted may show some striking similarities, the etiologies of these behaviors differ considerably between groups. The behaviors of children with ADHD are generally thought to be caused by a neurological abnormality in the prefrontal cortex of the brain and/or neurotransmitter dysfunction (Barkley, 1990). ADHD-like behaviors exhibited by children who are gifted likely have far different explanations. Empirical research and theories in the gifted education literature help in understanding these behaviors.

Piechowski (1986), working from Dabrowski's theory of positive disintegration, argued that children who are gifted may possess "overexcitabilities" in five areas: psychomotor, sensual, intellectual, imaginal, and emotional. Children who are gifted are said to often have intense expressions in these domains and these expressions are thought to indicate advanced development. Some studies have provided partial support for Dabrowski's theory applied to gifted children (Kitano, 1990; Piechowski & Colangelo, 1984; Tucker & Hafenstein, 1990), but more investigation is required to make conclusions about its validity. Of particular relevance for this discussion are the psychomotor and imaginal overexcitabilities. Psychomotor overexcitability is indicated by behaviors such as rapid speech, impulsive actions, and increased bodily movement, while imaginal overexcitabilities are shown by intense visualization and daydreaming (Piechowski & Colangelo). Clearly, the psychomotor overexcitability of the gifted child could be labeled as "hyperactive" by the observer uninformed of some gifted children's tendencies. The gifted child expressing imaginal overexcitability through daydreaming may look inattentive, but could be using this uninterrupted time to think creatively (Cramond, 1994).

Further explanation of the ADHD-like behaviors of children who are gifted is provided by research on their typical educational environments. Webb and Latimer (1993) state that children who are gifted may spend a quarter to half of the school day waiting for their classmates to catch up. Such an environment fosters boredom and difficulty focusing attention on skills that were learned long ago. Gallagher and Harradine (1997) interviewed over 800 gifted students who clearly voiced their struggles in the classroom because of the slow pace of instruction, emphasis on facts rather than on thinking skills, and excessive repetition of mastered skills. Describing the typical educational environments of gifted students, Gallagher and Harradine state, "It is as if we, as adults, were taken aside and asked to learn how to read Dick and Jane or to master the multiplication tables" (p. 132). Therefore, it appears that the cause of gifted students' inattention is often due to boredom resulting from an unchallenging classroom environment. The authors of the *DSM-IV-TR* considered this possibility by stating, "Inattention in the classroom may also occur when children with high intelligence are placed in academically understimulating environments" (APA, 2000, p. 91).

Finally, Silverman's theory of asynchronous development is helpful in explaining gifted students' ADHD-like behaviors,

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particularly social problems (Silverman, 1997). Gifted children are at a higher risk than average children in experiencing asynchronous development, whereby a discrepancy exists between intellectual development and physical and/or social development. In addition, the greater the discrepancy between intellectual and social development, the greater likelihood a child will struggle internally and in social relationships. While experiencing asynchronous development then, a gifted child is prone to social problems. Likewise, children with ADHD are prone to social difficulties (Dumas, 1998; Luteijn, et al., 2000). The similarities in social problems among gifted children and children with ADHD are great, and often mistaken.

Because of the disparate explanations of the similar behaviors of children with ADHD and children who are gifted, perhaps it is not surprising that many of these behaviors are only similar at a gross level. There are finer levels of analysis with regard to inattention, heightened activity, and impulse control between the two groups that can help distinguish them from one another. Certainly, at a gross level, children with ADHD and children who are gifted often have attention difficulties. A deeper consideration of this inattention indicates that gifted students' inattention is usually situation specific while inattention in children with ADHD is pervasive across settings (Webb & Latimer, 1993). In fact, the *DSM-IV-TR* requires that symptoms be present in two or more settings for a diagnosis to be made. It is not uncommon for gifted children to have attention problems at school, but none at home (Lind & Silverman, 1994), whereas children with ADHD often experience these problems in both settings (Barkley, 1990). Clearly, children who are gifted have the ability to maintain attention for long periods of time when they are interested. Lovecky (1994) states that this is also the case for some children with ADHD, but that gifted children have far more preferred activities to engage their attention.

In addition to inattention, both groups also often exhibit heightened activity levels and impulse control problems. Gifted students' high activity is generally focused and directed (Webb & Latimer, 1993), whereas the active behavior of a child with ADHD is usually random and not goal-directed (Leroux & Levitt-Perlman, 2000). Finally, both groups may exhibit impulsive behavior, but children who are gifted tend to answer correctly those questions they have impulsively responded to while children with ADHD tend to guess incorrectly (Lovecky, 1994).

Our argument thus far has been that the two groups often exhibit similar behaviors but that these behaviors have different explanations depending on whether the child has ADHD or is gifted. But what about the possibility that the child is both? The authors of the *DSM-IV-TR* allow for such a possibility, stating:

...on average, intellectual level, as assessed by individual IQ tests, is several points lower in children with this disorder compared with peers. At the same time, great variability in IQ is evidenced: individuals with Attention-Deficit/Hyperactivity Disorder may show intellectual development in the above-average or gifted range. (APA, 2000, p. 88)

The *DSM-IV-TR* provides no data on the prevalence rate of this combined condition, but it is likely to be low. Webb (2000) stated, "Some gifted children surely do suffer from ADHD, and thus have a dual diagnosis of gifted and ADHD; but in my opinion, most are not" (p. 5). It is not within the scope of this paper to discuss the comorbidity of ADHD and giftedness, but the reader is referred to Lovecky (1999) for further information.

Although, as is clear from the discussion of above, the diagnosis of ADHD, giftedness, or both can be a difficult one to make, accuracy in diagnosis is paramount. Misdiagnosis has potentially harmful consequences. Guenther (1995) argued that if a child's behaviors are construed as being negative, it is unlikely that the child will be seen as gifted. Therefore, once the ADHD diagnosis is placed on the child, it may be very difficult to perceive his or her behavior any other way but within that framework. Diagnosing children with ADHD when they are truly gifted also leads to inappropriate treatment. It is very common to provide stimulant medication for ADHD. There is some evidence that such medication can impair cognitive performance (Cantwell, 1996). In addition, stimulant medication can have negative side effects, including appetite suppression, insomnia, irritability, anxiety, sadness, and nightmares (Efron, Jarman, & Barker, 1997). It seems unconscionable for gifted children to unnecessarily experience such negative effects from stimulant medication. Gifted children's risk-taking behaviors and high energy levels are behaviors that could be perceived as problematic in a traditional school setting, but they are the very attributes that will allow them to be successful later in life (Guenther, 1995). As Baum and Olenchak (2002) stated, "There is little doubt that in at least some cases, students of high ability are being 'cured of their giftedness' in an exchange for controlled, compliant behavior" (p. 79). The consequence of misdiagnosis to the well being of the individual child is obvious, but we must also consider the broader consequence of potential loss of human capital. On the other hand, missing the diagnosis of ADHD in gifted children who truly experience the disorder is also deleterious. ADHD is a serious medical condition that can incapacitate a person from functioning at his or her fullest potential. Effective treatment options exist, but a correct diagnosis must first be given.

A heavy burden is placed on those who are responsible for identifying and distinguishing between students who are gifted and students who have ADHD. Often individuals in the counseling and psychological services offices of schools are relied on to identify these children. The gifted literature suggests that there is currently little training for school personnel that would allow them to make competent decisions regarding the distinction between ADHD and giftedness (Silverman, 1998). In addition, it appears that little or no empirical research has been conducted to assess the possibilities for misdiagnosis between giftedness and ADHD. Therefore, the purpose of this pilot study is to test the possibility for misdiagnosis empirically and determine whether future school counselors receive training that would enable them to tell the difference between ADHD and giftedness. In other words, can a presentation of the same constellation of behavioral characteristics result in different diagnoses of either ADHD or giftedness, depending on the bias of the individual making the diagnosis?

The following method owes much to the classic psychiatric "suggestion" research of the late 1960s and early 1970s. For example, Temerlin (1968) looked directly at suggestion effects in psychiatric diagnosis by exposing various mental health professionals to an audio recording of a potentially mentally unhealthy man (played by an actor). Before listening to the tape, the subjects were allowed to overhear the passing comments of a professional person of high prestige. In one condition, the passing comment was, "the patient is a perfectly healthy man," and in the other condition, "he looked neurotic but actually was quite psychotic." When the diagnosis of healthy was suggested to the subjects, they unanimously

agreed that the man showed no signs of disturbance. When a disorder was suggested, 92% of the subjects diagnosed some dysfunction, 60% of which considered him psychotic. In a similar vein, the concept of introducing a biased suggestion to affect outcome behavior (i.e., the possibility of giftedness as a diagnostic option) is a key component of this study.

Method

Participants

Forty-four first year graduate students enrolled in a school counseling program in a large, public, Midwestern university volunteered to participate in this study. Demographic information is presented in Table 1. Students were chosen out of convenience, as the professors of the school counseling program allowed the researchers to collect data from their students. Of the 44 students who volunteered to participate, subjects were chosen at random to be placed in either the experimental group or the control group. Twenty-two participants were placed in each group.

Materials

Two vignettes were used in this study. Form A, the form without diagnostic alternatives that allowed for free recall, and Form B, the form with diagnostic alternatives that required students to choose a diagnosis among choices supplied, contained identical passages that described characteristics of a hypothetical seven-year-old boy. The researchers constructed the passage based on Webb and Latimer's (1993) research regarding the similarity of symptoms related to ADHD and giftedness. The similar symptoms were used to describe the child in a vignette format. The passage read as follows:

Sam is 7 years old and a second grader. He has been referred to you for assessment by his teacher. He has a high activity level and appears more restless than other children his age. Sam has difficulty restraining

his desire to talk in the classroom and interrupts his teacher often. The teacher has repeatedly tried to change Sam's behavior, but Sam questions authority and has a difficult time accepting rules and regulations. Sam's homework is frequently messy because he appears careless or inattentive to details. Sam has a poor attention span, especially when he is bored. Sam's home environment appears to be normal.

Both forms asked the participants to read the passage and answer the questions following the passage. Form A asked, "If this child were referred to you by his teacher for evaluation, what do you think the underlying explanation for his behavior would be?" Form B asked, "If this child were referred to you by his teacher for evaluation, do you think the cause of his behavior could be attributed to Attention Deficit Hyperactivity Disorder (ADHD) or due to his being gifted and talented (G/T)?" Both forms also asked for demographic information.

Procedure

Participants volunteered to fill out the questionnaire while in an introductory graduate level course in school counseling. Participants were assured that participation was voluntary, that all results were anonymous, and that their participation would have no affect on their standing in the class. The researcher randomly gave half of the participants Form A and the other half Form B.

Results

A chi-square analysis was used to determine the difference in choice of diagnosis based on whether the participant was answering a form with diagnostic alternatives (Form B) or a form without diagnostic alternatives (Form A). The independent variable was the type of form and the dependent variable was the diagnosis. The diagnoses based on the form used can be seen in Table 2. A diagnosis of "gifted" indicates the participant attributed the behaviors solely to giftedness, a diagnosis of "ADHD" indicates the participant attributed the behaviors solely to ADHD, a diagnosis of "both" indicates the participant attributed the behaviors to both giftedness and ADHD, and a diagnosis of "neither/other" indicates the participant attributed the behaviors to neither giftedness or ADHD, but to another diagnosis such as a learning disability or a mental disorder.

The results indicate a significant main effect between the type of form and the diagnosis made by the participant. A chi-square analysis shows that the difference between Form A and Form B is largely due to participants diagnosing giftedness, neither/other, or both on Form B more often than on Form A, indicating that the suggestion of the giftedness category can influence the diagnosis of behaviors typical of both giftedness and ADHD ($\chi^2(3, 44) = 13.10, p = .004$). To further illustrate, 46% of the participants given Form B suggested a diagnosis of giftedness (14%) or both giftedness and ADHD (32%). Of the participants given Form A, 0% suggested a diagnosis of giftedness or both giftedness and ADHD. Because Cramer's V is

Demographic Information	
	Frequency
Age	
20-25	33
26-30	7
31-35	1
older than 36	1
Gender	
Female	35
Male	8
Ethnicity	
Caucasian	29
African-American	2
Hispanic	3
Asian	7
Other	1
Undergraduate Degree	
Education	7
Psychology	28
Other	8
Previously a Teacher	
Yes	10
No	33
Work for Social Services	
Yes	16
No	27

Table 1

Diagnosis Based on Biased or Unbiased Form					
	Gifted	ADHD	Both	Neither/Other	Total
Biased (B)	3	10	7	2	22
Unbiased (A)	0	17	0	5	22
Total	3	27	7	7	44

Table 2

.546, this fairly large effect size indicates that the difference is also practically meaningful (Cohen, 1988).

Discussion

This study indicates the possibility that counselor training programs, particularly in the first year, may not adequately clarify the differences between ADHD and giftedness for their students. Such a deficit in their training can lead to an inappropriate referral for ADHD diagnosis and dire consequences for the incorrectly identified child. As hypothesized, the suggestion of the diagnosis of giftedness resulted in a less prevalent diagnosis of ADHD. Without suggestion of the possibility of giftedness, the future counselors appeared unaware of the similar behaviors of children with ADHD and gifted children. In fact, not one subject in the experimental condition indicated the possibility of giftedness, even though there was no information in the vignettes that would allow subjects to distinguish between ADHD and giftedness because all behaviors described are characteristic of both groups of children.

That the mere suggestion of the possibility of giftedness in the experimental condition swayed nearly half the subjects in that condition is promising, yet unclear. These results are promising because they might suggest that the similarities between ADHD and giftedness are not as unknown as previously thought. It might be that the suggestive power of the experimental vignette triggered prior knowledge or experience of the subjects in this condition. The influence of this suggestion should not be overstated, however, considering approximately half the subjects in the experimental condition maintained only the possibility of ADHD or other conditions. This may suggest an exclusion of coverage of the characteristics of gifted children in this, and possibly other, school counseling graduate programs.

The reasons are unclear as to why no participants in the unbiased condition considered the possibility of giftedness. Because participants in this study were randomly placed into groups, it is probable that, had the participants in the control condition been given the suggestion, they too would have more frequently considered giftedness as a possibility. It might be that these individuals were somewhat familiar with the similarities between gifted children and children with ADHD but that these similarities were not at the forefront of their diagnostic thought processes. In addition, participants such as these who were drawn from the mental health field may have a pathology-driven perspective and may not, in their training, have been exposed to a positive explanation of seemingly negative behaviors, such as that of giftedness. Because ADHD is currently a popular diagnosis, the judgment of participants not receiving suggestion may have been overridden by this popularity in the face of no other obvious alternative.

Because this is a pilot study, there are clearly limitations that hinder the interpretability and generalizability of these findings. First, the sample size (a small number of subjects in only one graduate program) of the study is rather small and limits its generalizability. In addition, it should be emphasized that the participants were in the first year of their graduate program and that information regarding gifted students may have come later in their training. Finally, it is possible that the vignette format may not have allowed the participants to make a well-informed decision. There was a limited amount of information included in the vignettes and it is unknown whether the participants would have considered giftedness more often had they been given more information.

Future research should address the shortcomings of this study so that more solid conclusions can be drawn. It would be interesting to sample participants from a representative pool of graduate programs across the country and to use students who are both in the beginning and at the end of their training. Additionally, it would be interesting to use a sample of experienced professionals such as school counselors, school psychologists, and teachers. Lastly, it would be relevant to not only study the diagnosis that these individuals make, but also their reasoning in coming to their decisions.

In summary, this study indicates that counselors in training may not receive information concerning the similarities between children with ADHD and gifted children. If this issue is not addressed at some point in their training, gifted children may be inappropriately referred for an ADHD diagnosis. Despite the presence of literature suggesting the possibility of misdiagnosis, it appears that this is the first study to address this issue empirically. Due to the harmful impact that the misdiagnosis of ADHD can have on gifted children, future research should continue to address whether this is a real phenomenon, and if so, what needs to be done to remedy this potential problem.

REFERENCES

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.
- Barkley, R. A. (1990). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.). New York: Guilford.
- Baum, S. M., & Olenchak, F. R. (2002). The alphabet children: GT, ADHD, and more. *Exceptionality, 10*(2), 77-91.
- Brown, M. B. (2000). Diagnosis and treatment of children and adolescents with attention deficit/hyperactivity disorder. *Journal of Counseling and Development, 78*, 195-203.
- Cantwell, D. (1996). Attention deficit disorder: A review of the past 10 years. *Journal of the American Academy of Child & Adolescent Psychiatry, 35*, 978-987.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cramond, B. (1994). Attention-deficit hyperactivity disorder and creativity- What is the connection? *The Journal of Creative Behavior, 28*(3), 193-210.
- Dumas, M. C. (1998). The risk of social interaction problems among adolescents with ADHD. *Education and Treatment of Children, 21*(4), 447-460.
- Efron, D., Jarman, F., & Barker, M. (1997). Side effects of methylphenidate and dexamphetamine in children with attention deficit hyperactivity disorder: A double-blind, crossover trial. *Pediatrics, 100*, 662-666.
- Gallagher, J., & Harradine, C. C. (1997). Gifted students in the classroom. *Roeper Review, 19*(3), 132-136.
- Ghodse, A. H. (1999). Dramatic increase in methylphenidate consumption. *Current Opinion in Psychiatry, 12*, 265-268.
- Guenther, A. (1995). *What educators and parents need to know about... ADHD, creativity, and gifted students*. Storrs, CT: National Research Center on the Gifted and Talented.
- Kitano, M. K. (1990). Intellectual abilities and psychological intensities in young children: Implications for the gifted. *Roeper Review, 13*(1), 5-10.
- Lawler, B. (2000). Gifted or ADHD: Misdiagnosis? *Understanding our Gifted, 13*(1), 16-18.
- Leroux, J. A., & Levitt-Perlman, M. (2000). The gifted child with attention deficit disorder: An identification and intervention challenge. *Roeper Review, 22*(3), 171-176.
- Lind, S., & Silverman, L. (1994). ADHD or gifted? *Understanding our Gifted, 6*(5), 13-19.
- Lovecky, D. V. (1994). Gifted children with Attention Deficit Disorder. *Understanding Our Gifted, 6*(5), 1, 7-10.
- Lovecky, D. V. (1999, October). *Gifted children with AD/HD*. Paper presented at the Annual CHADD International Conference, Washington, DC.
- Luteijn, E. F., Serra, M., Jackson, S., Steenhuis, M. P., Althaus, M., Volkmar, F., & Minderaa, R. (2000). How unspecified are disorders of children with a pervasive developmental disorder not otherwise specified? A study of social problems in children with PDD-NOS and ADHD. *European Child and Adolescent Psychiatry, 9*(3), 168-179.
- Olson, M., Marcus, S. C., Weissman, M. M., & Jensen, P. S. (2002). National trends in the use of psychotropic medications by children. *Journal of the American Academy of Child & Adolescent Psychiatry, 41*, 514-521.
- Perry, R. (1998). Misdiagnosed ADD/ADHD; Rediagnosed PDD. *Journal of the American Academy of Child & Adolescent Psychiatry, 37*, 113-114.
- Piechowski, M. M. (1986). The concept of developmental potential. *Roeper Review, 8*, 191-197.
- Piechowski, M. M., & Colangelo, N. (1984). Developmental potential of the gifted. *Gifted Child Quarterly, 28*(2), 80-88.
- Silverman, L. K. (1997). The construct of asynchronous development. *Peabody Journal of Education, 72*(3-4), 36-58.
- Silverman, L. K. (1998). Through the lens of giftedness. *Roeper Review, 20*(3), 204-210.
- Termerlin, M. K. (1968). Suggestion effects in psychiatric diagnosis. *Journal of Nervous and Mental Disease, 147*, 349-353.
- Tucker, B., & Hafenstein, N. L. (1997). Psychological intensities in young gifted children. *Gifted Child Quarterly, 41*(3), 66-75.
- Webb, J. T. (2000, August). *Mis-diagnosis and dual diagnosis of gifted children: Gifted and LD, ADHD, OCD, oppositional defiant disorder*. Paper presented at the American Psychological Association Annual Convention, Washington, DC.
- Webb, J. T., & Latimer, D. (1993). *ADHD and children who are gifted*. Reston, VA: Council for Exceptional Children. ERIC Digests E522, EDO-ED-93-5

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