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# Empirical Investigation of Twice-Exceptionality: Where Have We Been and Where Are We Going?

**Megan Foley Nicpon[1], Allison Allmon[1], Barbara Sieck[1], and Rebecca D. Stinson[1]**

**Abstract**

Gifted students with coexisting disabilities, also known as twice-exceptional, are increasingly recognized in America's schools. This increasing awareness needs to be met with equal enthusiasm for empirical investigation into the identification and treatment needs of this group of students. In this article, a 20-year review of the empirical literature examining twice-exceptionality, specifically gifted students with learning disabilities, attention deficit hyperactivity disorder, or autism spectrum disorder, was conducted. Research strongly suggests that gifted students can have a coexisting disability and that comprehensive, individualized approaches toward diagnosis are necessary. Less is known about effective treatments and interventions that simultaneously highlight strengths and accommodate for areas of growth. Future research directions are offered that ideally will encourage scholars to discover more about effective diagnostic and intervention techniques for this very important group of gifted learners.

**Putting the Research to Use**

The purpose of this article is to provide a comprehensive summary of the last 20 years of empirical research examining gifted students with specific learning disabilities, Attention-Deficit/Hyperactivity Disorder, or autism spectrum disorders. Scholars can extrapolate from this summary a research agenda that will move the field forward in the pursuit of empirically validated identification and intervention techniques with twice-exceptional learners. Educators are encouraged to use this information when developing gifted identification protocols in schools, accommodation plans for twice-exceptional students, and interventions that target specific strength and growth areas. Finally, parents of twice-exceptional learners can reference the empirical studies summarized as they search for research-based approaches to helping their child.

**Keywords**

identification, twice-exceptional, assessment

Within the field of gifted education, the term *twice-exceptional*, which refers to a student who simultaneously possesses a gift and a disability, has received increasing attention. Scholars and educators alike seek answers to the diagnostic and intervention questions required to adequately serve these students in and out of the classroom. Yet this increasing attention has not always been matched with empirical evidence supporting students' needs, prompting some to deny even the existence of the twice-exceptional learner (Lovett & Lewandowski, 2006). To date, there are few reviews of the empirical literature examining twice-exceptionality that summarize what is known about these learners based on research findings and propel scholars in directions for future study. To address this need, the present article summarizes 20 years of twice-exceptionality research in three specific areas of disability: (a) specific learning disabilities (SLD), (b) attention deficit hyperactivity disorder (ADHD), and (c) autism spectrum disorder (ASD). The article is divided into three parts: (a) a brief overview of twice-exceptionality; (b) a discussion of gifted students with SLD, ADHD, and ASD and the corresponding empirical research in each area; and (c) recommendations for moving forward the empirical investigation of twice-exceptionality.

## An Overview of Twice-Exceptionality

With the passage of the Education for All Handicapped Children Act in 1975, greater educational emphasis was placed on students with disabilities, which in turn sparked an

[1]The University of Iowa, Iowa City, IA, USA

**Corresponding Author:**
Megan Foley Nicpon, PhD, College of Education, The University of Iowa, Belin-Blank Center for Gifted Education and Talent Development, 600 Blank Honors Center, Iowa City, IA 52242-0454, USA
Email: megan-foley-nicpon@uiowa.edu

interest in gifted students with coexisting disabilities (Reis & McCoach, 2002). This legislation, renamed the Individuals with Disabilities Education Improvement Act (IDEA; 2004) and amended in 2004, states that students are legally entitled to free, appropriate education in the least restrictive environment. Some have interpreted this to mean that the least restrictive environment for a twice-exceptional student would provide services for both disabilities and gifts (Weinfeld, Barnes-Robinson, Jeweler, & Shevitz, 2002), yet this approach is not always implemented in schools. Instead, the twice-exceptional learner typically is believed to be succeeding in the educational environment as long as her or his grades are commensurate with her or his peers.

It is estimated that there are approximately 300,000 twice-exceptional students in the United States educational system (Baum & Owen, 2004); the exact figure is not known for several reasons. First, no formal system exists for tracking the prevalence rates of twice-exceptionality in the medical or educational system. Second, twice-exceptional students may be identified for gifted and talented programming, but their disability or diagnosis may not be identified or may be recognized only later on in their development. Third, twice-exceptional students may be identified for special programming or accommodations (i.e., the Individualized Education Plan [IEP] or 504 Plan) but might not have their gifts recognized through acceleration or enrichment opportunities. Last, twice-exceptional students may not be identified as gifted or as needing accommodations if they are progressing through school at grade-level expectations such that curriculum-based assessments do not identify their gifts or areas of disability. These possibilities highlight the many reasons why scholars and educators alike are unsure of just how many twice-exceptional students exist.

The issue of prevalence is complicated by the fact that there is no clear definition of what does, or does not, constitute twice-exceptionality. Of the 13 disability categories identified under IDEA, all but one (Mental Retardation) could exist in a cognitively/academically gifted student, but not all exceptionalities are commonly discussed or researched within the context of giftedness. Our review of the empirical literature of twice-exceptionality revealed that the three most commonly investigated areas are gifted students with (a) SLD; (b) ADHD, which falls under the "Other Health Impairment" category in IDEA; and (c) ASD. Therefore, these three areas of exceptionality are the focus of the current article.

### *Empirical Inquiry Methodology*

To examine the depth and breadth of empirical investigation of gifted students with SLD, ADHD, or ASD, searches were conducted on PsycINFO and ERIC databases. The parameters were that the articles must have been published within the past 20 years (1990-2009) and qualitative and/or quantitative investigation practices were employed. Keywords included "twice-exceptional," "gifted," "talented and gifted," "learning disability," "autism," "Asperger," "ADD," and "ADHD." The results of this inquiry are provided in the next section.

## Twice-Exceptional: Academically Gifted Students With SLD

Although the premise that children can have coexisting gifts and learning disabilities generally has been accepted within the field of gifted education (Assouline, Foley Nicpon, & Whiteman, 2010; Baum, 1984; Baum & Owen, 1988; Brody & Mills, 1997; Neihart, 2008; Nielsen, 2002), gifted students with SLD are difficult to recognize because there is no concrete definition of how these dual "labels" manifest in one child. The U.S. Department of Education has defined both "gifted" and "learning disabled" but has not addressed how they intersect. As identified by the No Child Left Behind Act (2002), the federal government defined gifted learners as those

> who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities. (p. 1959)

This broad definition rightly casts a wide net to discover and foster talent, yet it is difficult to operationalize for application in schools. Because gifted education is not regulated or funded on a national level, each state (or each school district if not regulated by the state) can create its own definition of giftedness and determine the identification process used to decide which students will receive services (NAGC, n.d.; Tallent-Runnels & Sigler, 1995). The IDEA (2004) defines a learning disability as a

> disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations. (p. 13)

With two, nonoverlapping definitions, teachers and administrators are left with only a vague, inadequate understanding of what a gifted/SLD student may look like (Baum & Owen, 1988; McCoach, Kehle, Bray, & Siegle, 2001). This also complicates conducting research because of the lack of sample standardization. Nevertheless, there has been more empirical investigation of gifted students with SLD than any other area of twice-exceptionality.

### *Empirical Review*

In a review of empirical research conducted within the past 20 years, we discovered *21 empirical studies* examining gifted

**Table 1.** Empirical Studies Related to Gifted/SLD Students

| Reference | Participants | Methodology | Main Findings |
|---|---|---|---|
| Identification and referral | | | |
| Assouline et al. (2010) | 14 gifted/SLD students | Quantitative | Use of GAI instead of a Full-Scale IQ may be more appropriate when identifying a gifted/SLD student for services |
| Bianco (2005) | 52 special education teachers<br>195 general education teachers | Quantitative | Both groups less willing to refer students with a disability label to gifted programs; special education teachers less likely to refer gifted students, with or without disabilities, to a gifted program |
| Ferri et al. (1997) | 48 gifted/SLD college students<br>46 SLD college students | Quantitative | Gifted/SLD students diagnosed later than SLD students; gifted/SLD students more likely to be identified for the first time during college; male students diagnosed at younger ages than female students |
| Minner (1990) | 197 gifted education teachers | Quantitative | Teachers less willing to refer SLD students for placement in gifted programs |
| Reis et al. (1995, 1997, 2000) | 12 gifted/SLD college students | Qualitative | Negative school experiences, including late identification of SLD, self-contained special education classes, retention, and tracked classes that coincided with SLD but not giftedness |
| Tallent-Runnels and Sigler (1995) | 388 gifted education coordinators | Quantitative | Few districts (19.7%) select gifted/SLD students for gifted programs |
| Cognitive and academic patterns | | | |
| Assouline et al. (2010) | 14 gifted/SLD students | Quantitative | Range of scores on all ability indices for students: no set pattern of cognitive ability; verbal abilities more advanced than nonverbal abilities; working memory and processing speed similar to age expectations |
| Bireley and Languis (1992) | 11 gifted/SLD students | Quantitative | Sequencing and distractibility symptoms depressed; Full Scale IQ scores; written-language difficulties and slower processing among the sample; comorbid ADHD |
| Ferri et al. (1997) | 48 gifted/SLD college students<br>46 SLD college students | Quantitative | Gifted/SLD high in verbal comprehension and abstract thinking; high variability in cognitive scores of gifted/SLD vs. SLD profiles |
| Hannah and Shore (2008) | 12 gifted/SLD boys | Qualitative | Twice-exceptional participants used metacognitive skills to monitor, evaluate, and control their reading (high school–level students more than elementary-level students); elementary students more likely to be confident in prior knowledge than high school students |
| Hannah and Shore (1995) | 12 gifted male students<br>12 gifted/SLD male students<br>12 average-performing male students<br>12 SLD male students | Quantitative | Metacognitive performance of gifted/SLD students resembled that of gifted students more than SLD students |
| Montague (1991) | 3 gifted students<br>3 gifted/SLD students | Qualitative | Gifted students used more cognitive and metacognitive skills and were more strategic and mindful in their approach to solving math problems than gifted/SLD students |
| Waldron and Saphire (1990) | 14 gifted/SLD students<br>17 gifted students | Quantitative | Gifted/SLD more reliant on verbal conceptualization and reasoning; gifted/SLD showed deficiencies in short-term auditory memory and sound discrimination |
| Waldron and Saphire (1992) | 24 gifted/SLD students<br>24 gifted students | Quantitative | Gifted/SLD weaker in decoding skills, spelling, most areas of math, auditory memory and discrimination, visual discrimination, sequencing, and spatial abilities |

*(continued)*

**Table 1.** (continued)

| Reference | Participants | Methodology | Main Findings |
|---|---|---|---|
| Psychosocial factors | | | |
| Assouline et al. (2010) | 14 gifted/SLD students | Quantitative | Parents reported more "at-risk" scores on BASC-2 than teachers; students' self-report means on BASC-2 solidly in average range; students' mean percentile rankings on Piers-Harris subscales all in average range |
| Coleman (1992) | 21 gifted/SLD boys<br>21 SLD/average-performing boys | Quantitative | Gifted/SLD engage in more planful problem solving; SLD/average engage in more distancing, helplessness, and escape-avoidance behaviors |
| Dole (2001) | 4 gifted/SLD college students | Qualitative | Positive identity formation related to strong support systems, involvement in extracurricular activities, work, and volunteer experiences, as well as self-knowledge, self-acceptance, self-advocacy, and self-determination |
| Reis et al. (1995, 1997, 2000) | 12 gifted/SLD college students | Qualitative | Negative school experiences, including problems with peers, negative interactions with teachers, and difficulty reconciling giftedness with SLD |
| Vespi and Yewchuk (1992) | 4 gifted/SLD male students, students' parents, and teachers | Qualitative | General positive feelings of self-image and self-confidence; inconsistent social skills and frustrated with peer relationships; ability to accurately interpret and react to nonverbal behavior; feelings of frustration and anxiety related to school; general negative attitude toward school; high fear of failure; and unrealistic expectations of self, primarily internally motivated |
| Effects of interventions | | | |
| Crim et al. (2008) | 225 SLD/low-ability students<br>708 SLD/average-performing students<br>112 gifted/SLD students | Quantitative | Gifted/SLD students offered fewer modifications than other groups based on IEP documentation |
| Mann (2006) | 5 teachers, 1 administrator | Qualitative | Atmosphere of caring, strength-oriented accommodations, and student-centered learning themes emerged as best practices for working with spatially gifted students with verbal weaknesses |
| Olenchak (2009) | 57 gifted/SLD students | Qualitative and quantitative | Attitude toward school significantly improved after participation in Talents Unlimited counseling; significant gains in pretest/posttest self-concept |
| Olenchak (1995) | 108 gifted/SLD students | Quantitative | Attitude toward school more positive after participating in enrichment/treatment activities; significant gain in self-concepts after participation; gains in attitude toward school learning |
| Reis et al. (1995, 1997, 2000) | 12 gifted/SLD college students | Qualitative | Benefits gained from use of compensation supports, study/performance strategies, learning strategies, parental support, self-perceived strengths, and participation in a university SLD program |

Note: SLD = specific learning disabled; GAI = General Ability Index; IQ = intelligence quotient; ADHD = attention deficit hyperactivity disorder; IEP = Individual Education Plans.

students with SLD (see Table 1). These 21 studies have been divided into four categories for discussion: (a) identification and referral, (b) cognitive and academic patterns, (c) psychosocial factors, and (d) effects of intervention.

*Identification and referral.* Many authors have discussed the unique characteristics of twice-exceptional students, as well as those they share with gifted students or students with learning disabilities (see Reis, Neu, & McGuire, 1995, for a more detailed discussion). Although the gifted-education community agrees that gifted students with learning disabilities exist, there remain large challenges in identifying such students. For example, the students' disability could affect their testing

performance, and thus, they will not meet the gifted criteria (Bireley, Languis, & Williamson, 1992; Nielsen, 2002). In fact, Assouline et al. (2010) found that relying on a Full Scale IQ score instead of a General Ability Index (GAI), which describes a student's higher order cognitive functioning without the influence of working memory and processing speed (scores that are often lower in twice-exceptional students), may eliminate him or her from being identified and receiving appropriate programming.

Differing state criteria for giftedness and learning-disability services also makes identification problematic (Nielsen, 2002), particularly when school districts do not consider modifying their gifted children selection process to include gifted students with SLD students (Tallent-Runnels & Sigler, 1995). A new focus on curriculum-based assessment possibly could lead to fewer referrals for services for those students who are performing average or above in a given academic area, despite the relative discrepancy between this performance and their cognitive abilities (Assouline et al., 2010). Furthermore, as highlighted through the many studies outlined in Table 1, the pervasive misconception that inclusion in gifted programs and selection for special remedial education services are mutually exclusive is inherently harmful to identification of both gifts and disabilities (Bianco, 2005; Ferri, Gregg, & Heggoy, 1997; Minner, 1990; Reis et al., 1995; Reis, McGuire & Neu, 2000; Reis, Neu, & McGuire, 1997).

Several authors give alternative suggestions for how gifted students with learning disabilities should be identified. First, a comprehensive individualized evaluation that employs an intra-individual, rather than an interindividual, approach toward ability and achievement analysis is critical (Assouline et al., 2010; Brody and Mills, 1997; Nielsen, 2002). While a student's reading achievement may be "average" when compared with age mates, it could be significantly discrepant from expectations given the same student's verbal cognitive ability. Furthermore, academic and ability test scores must be accompanied by a variety of other developmental, performance, psychometric, and sociometric sources of information to assess above-average ability, creativity, or task commitment (Baum, 1984; Brody & Mills, 1997; Nielsen, 2002). Especially when identifying SLD in students already labeled gifted, McCoach et al. (2001) suggest looking at achievement test scores or multimeasure assessments over time to detect declining performance even though the student still displays superior ability. Continued examination of alternative ways to identify twice-exceptional students for gifted programming is warranted because of the significant risk that they will fall through the cracks if more traditional identification methods are employed (Tallent-Runnels & Sigler, 1995).

*Cognitive and academic patterns.* The empirical studies conducted regarding the cognitive patterns of gifted students with a SLD provide relatively consistent findings. These students have very strong verbal abilities, such as verbal comprehension, conceptualization, and reasoning (Assouline et al., 2010; Bireley & Languis, 1992; Ferri et al., 1997; Waldron & Saphire, 1990). Also, nonverbal abilities are typically weaker, especially in areas of spatial abilities, decoding, auditory working memory, and processing speed (Assouline et al., 2010; Waldron & Saphire, 1990, 1992). Yet conclusions from these studies also highlight that twice-exceptional students may have a wide range of score variability, making it unfeasible to define a single, distinctive twice-exceptional profile (Assouline et al., 2010; Ferri et al., 1997). As such, it is not possible to make an SLD diagnosis after examination of a gifted child's ability profile alone. Rather, additional achievement, psychosocial, and contextual information must be gathered to delineate what constitutes an SLD in an academically gifted student. When this comprehensive evaluative approach is employed, areas of specific cognitive and academic strength are identified, as well as areas of difficulty or disability (Assouline et al., 2010).

Three studies (Hannah and Shore, 1995, 2008; Montague, 1991) examined metacognitive skills among gifted and twice-exceptional skills. Metacognitive skills, or students' abilities to solve problems and apply knowledge to new situations, are believed to be well developed in gifted students but deficient in students with learning disabilities. In the first Hannah and Shore study (1995), researchers found that gifted students with SLD were more likely to use metacognitive strategies than those with average or below academic skills. More recently, Hannah and Shore (2008) discovered that while twice-exceptional boys used metacognitive skills, their confidence and reliance on their abilities waned somewhat by high school. Montague's 1991 case study analysis concluded that gifted students with SLD were not as successful as gifted students without SLD in using metacognitive skills to solve mathematics problems. It may be that gifted students with SLD need specific guidance about how to apply problem-solving and other metacognitive skills, as well as assurance of their cognitive gifts, which could enhance learning in their area of difficulty.

*Psychosocial factors.* Because twice-exceptional students often are faced with negative school experiences and interactions (Reis et al., 1995, 1997; Reis et al., 2000; Vespi & Yewchuk, 1992), it is not surprising that internalized feelings of failure, depression, low self-efficacy, and worthlessness can be present, along with externalizing behaviors such as aggression and hyperactivity. This negative emotionality is particularly disheartening because these students were found to have a great capacity for motivation and confidence (Vespi & Yewchuk, 1992). Positively, Coleman's 1992 work suggests that gifted students with SLD possess adaptive coping mechanisms to deal with the significant stressors and frustrations they face in school, and Dole (2001) found that positive identity formation of gifted college students with SLD is related to self-advocacy and self-determination. Others researchers, however, found that psychosocial functioning among gifted students with SLD is variable, with parents and teachers

reporting more severe psychosocial difficulties than the students themselves, who generally reported levels of internalizing and externalizing problems in the normative range (Assouline et al., 2010). These differing results provide further evidence that an individualized approach is necessary when addressing the psychosocial needs of gifted students with learning disabilities. To help students process feelings such as frustration, anxiety, and anger, as well as help build resilience, counseling services are recommended when these psychosocial issues are identified through a comprehensive evaluation (Assouline et al., 2010; Coleman, 1992; Nielsen, 2002; Reis et al., 2000). Resources exist to guide professionals in working with twice-exceptional students (e.g., Mendalgo & Peterson, 2006) so that psychotherapy is conducted within the context of the students' abilities and strengths.

*Effects of intervention.* Of all the research studies examined, one of the most extensive quantitative studies was recently conducted by Crim, Hawkins, Ruban, and Johnson (2008). The IEPs for 1,045 students receiving services for a specific learning disability were examined and separated into three groups: (a) high ability (IQ score of 116 or above; $n = 112$), (b) average ability (IQ score between 85 and 115; $n = 708$), and (c) low ability (IQ score of 84 or below; $n = 225$). Of the 112 high-ability students, there was no indication in the IEP that a single student had been referred for gifted and talented services. Furthermore, students in the high-ability group received fewer educational modifications than students in the average- or low-ability groups, and no students received reteach or retest accommodations or the opportunity to take tests in a small-group environment. Whether the high-ability students required fewer accommodations than the students in the other two groups or whether they were not afforded as many accommodations because of their higher abilities is not known. What is clear from these results is that there are a significant number of students who simultaneously possess above-average intelligence and an identified SLD but may not be receiving services for their strengths as well as their areas for growth.

Despite these variable findings, research is being conducted to establish effective interventions for gifted students with learning disabilities. Two studies with encouraging outcome data have been reported by Olenchak (1995, 2009). In both investigations, participation in yearlong interventions aimed at building strengths while addressing weaknesses showed a significant improvement in attitude toward school and self-concept. While the earlier study (Olenchak, 1995) focused on enrichment techniques used in the classroom and with the students' individualized education plans, the most recent focused on the use of Talents Unlimited counseling for gifted students with SLD (Olenchak, 2009). Talents Unlimited (Schlichter & Palmer, 1993) has been shown to strengthen critical thinking skills, self-concept, and metacognition in students by developing skills in five talent areas: productive thinking, communication, forecasting, decision making, and planning. By counseling gifted students with SLD both individually and in groups twice-weekly to learn the Talents Unlimited skills, it was hoped that the strategies could be used to "enhance development of their strengths while simultaneously providing compensatory skills for handling their learning weaknesses" (Olenchak, 2009, p. 147). Both investigations show great promise for recognizing and working successfully with students' gifts and areas for growth.

Although both disabilities and giftedness need to be addressed for the student to thrive academically, it may be most helpful to view these students as gifted first and as possessing a learning disability second in order to ensure that they remain challenged and engaged with school (Nielsen, 2002). As noted above, Olenchak (1995, 2009) found that when gifted students with SLD were treated as gifted and had access to gifted/enrichment programming, large gains were made regarding self-concept and attitude toward school. These twice-exceptional students need access to enrichment activities in their area(s) of interest and strength as well as remediation services for their difficulties (McCoach et al., 2001; Neihart, 2008; Nielsen, 2002). For example, a student could be subject accelerated in mathematics while receiving accommodations for his written-language difficulties. Such an approach likely will have a secondary affect of accommodating the social and emotional needs of a gifted student with SLD (Olenchak, 1995). When students are taught effective compensation strategies for their disabilities, they are given the opportunity to thrive in academically challenging environments (Reis et al., 1995, 1997; Reis et al., 2000). Interviews with teachers suggest that additional supportive factors, such as an atmosphere of caring about the individual student and providing student-centered, enriching learning experiences, facilitate additional means of supporting the twice-exceptional students' strengths (Mann, 2006). Early intervention is crucial; being faced with frustration and misunderstanding from the onset of school could be devastating to a young learner (Reis et al., 2000) and might prevent him or her from gaining confidence, self-efficacy, motivation, and excitement about learning.

## Twice-Exceptional: Academically Gifted Students With ADHD

It is well documented that academically gifted students can have coexisting ADHD (Cramond, 1995; Reis & McCoach, 2002; Webb & Latimer, 1993), which is one of the most commonly diagnosed (Barkley & Mash, 2003) and extensively researched (Brassett-Harknett & Butler, 2007) childhood conditions. Current conceptualization of the disorder is that it is a developmental condition that manifests both cognitively (e.g., executive functioning, memory, planning) and behaviorally (e.g., impulsivity, hyperactivity, distractibility) and that these symptoms exist on a continuum of severity (Brassett-Harknett & Butler, 2007). The etiology of ADHD is quite complex

because of the heterogeneous nature of the disorder, but mounting genetic and neurological evidence suggests a clear genetic component (Hill & Taylor, 2001), along with additional (and less researched) biomedical, psychosocial, and environmental influences (Brassett-Harknett & Butler, 2007). Further complicating the diagnosis of ADHD is the high rate of comorbidity with additional learning, mood, and behavioral disorders (Brassett-Harknett & Butler, 2007; Cantwell, 1996). Results from large-scale longitudinal studies indicate that many of those diagnosed with ADHD in childhood will demonstrate behavioral, psychiatric, and educational problems in adolescence and adulthood (Barkley, 2002; Barkley, Fischer, Edelbrock, & Smallish, 1990; Brassett-Harknett & Butler, 2007).

Scholars have identified characteristics of giftedness that overlap with ADHD symptomology, which may increase the risk for misdiagnosis (Chae, Ji-Hye, & Kyung-Sun, 2003; Hartnett, Nelson, & Rinn, 2004; Reis & McCoach, 2002). For example, hyperactivity could exist in students with academic giftedness or ADHD yet manifest differently (e.g., high but focused energy levels, which are direct and intense in the gifted child, or constant motion, diffusion of random energy, and restlessness in the child with ADHD). Symptom overlap is one of the many factors (i.e., arising from comorbidity, the environment, context, etc.) complicating the empirical investigation of gifted students with ADHD.

Close to a decade ago, Kaufmann, Kalbfleisch, and Castellanos's (2000) review of the literature examining ADHD among gifted students exemplified the complexity of this type of twice-exceptionality. For example, behavioral intervention was described as an effective treatment for students with ADHD; yet what reinforces a gifted student with ADHD may be much different from what reinforces other students with ADHD. The authors also hypothesized that the hyperfocus problems commonly present in children with ADHD are usually eliminated in a gifted student with ADHD when they experience intense focus or flow (Kaufmann et al., 2000). At the same time, other characteristics associated with ADHD can be problematic for the student, such as remaining focused during transitions, staying organized, and sustaining attention during less motivating activities.

## Empirical Review

In the past 20 years, there have been *17 empirical studies* investigating gifted students with ADHD (see Table 2). These 17 studies have been divided into two categories for discussion: (a) identification and characteristics and (b) treatment and intervention.

*Identification and characteristics*. The extant research examining academically talented students with ADHD suggests that students can unintentionally mask their ability and/or disability and simultaneously experience confounding social difficulties (Antshel et al., 2007; Antshel et al., 2008; Montgomery, 2007). For example, gifted students with latent ADHD may excel educationally until the academic rigor becomes too taxing on their attention resources. At the same time, a child could be identified as having attention difficulties but may possess high abilities that are not well documented because of difficulty paying attention during standardized tests (Baum, Olenchak, & Owen, 1998). Gifted students with elevated scores on behavioral rating scales were shown to exhibit relatively low scores on measures of attention and focus, which undoubtedly would influence test performance (Shaw & Brown, 1991). Even worse, students who present with a complicated set of abilities and deficits are often given multiple "labels," which only serves to gifted muddle the diagnostic and treatment picture (Baum & Olenchak, 2002). Anshtel et al. (2007) found that in comparison to gifted children without ADHD, gifted children with ADHD repeated grades more often, performed more poorly on individualized ability tests, and had more comorbid psychopathology, such as mood, anxiety, and disruptive behavior disorders. The ADHD diagnosis also was predictive of impairment in social and family functioning (Antshel et al., 2008) that extended into adulthood (Antshel et al., 2009). These results suggest that the comorbidity issues and deleterious outcomes affect gifted students with ADHD as they do the general population of students with ADHD.

A series of case study analyses employing a multiple-case design (individual case, within group, and cross group) examined the complex characteristics of gifted, ADHD, and gifted/ADHD boys (Moon, Zentall, Grskovic, Hall, & Stormont, 2001; Zentall, Moon, Hall, & Grskovic, 2001). The results of the comprehensive profile analysis suggested that the gifted boys with ADHD had more emotional intensity and distress than the boys with ADHD and the gifted boys. They also had more peer difficulties and identified family stressors associated with the diagnosis. Furthermore, all students with ADHD were more likely to underachieve, have trouble with task initiation and focus, and dislike homework than gifted boys. Interestingly, gifted/ADHD and ADHD boys showed a preference for learning science, social studies, space, and science fiction; had a desire to work with others; and reported enjoying free reading more than gifted boys. This finding may be related to Cramond's work (1994), which suggests that students with ADHD can have high levels of coexisting creativity. The researchers concluded that the gifted/ADHD group of boys clearly enjoyed a challenge and had specific areas of talent that should be fostered to help ensure long-term success. How creativity interacts with these factors needs to be specifically examined to aid in the academic development of the gifted student with ADHD (Cramond, 1995).

Some hypothesize that identification of both ADHD and giftedness often is overlooked by diagnosticians because of a lack of training and understanding about how these exceptionalities can and do coexist (Webb & Kleine, 1993). Currently, there is no empirical evidence to support this claim; however, results from a recent study (Hartnett et al., 2004)

**Table 2.** Empirical Studies Related to Gifted/ADHD Students

| Reference | Participants | Methodology | Main Findings |
|---|---|---|---|
| Identification and characteristics | | | |
| Antshel et al. (2007) | 92 gifted students<br>49 gifted/ADHD students | Quantitative | Children with high IQ and ADHD had a higher rate of familial ADHD in first-degree relatives, repeated grades more often, had poorer performance on the WISC-III Block Design, had more comorbid psychopathology, and had more functional impairments than children with high IQ alone |
| Antshel et al. (2008) | 92 gifted students<br>49 gifted/ADHD students | Quantitative | Children with high IQ and ADHD had higher rates of mood, anxiety, and disruptive behavior disorders; ADHD was a predictor of more impairment in social, academic, and family functioning |
| Antshel et al. (2009) | 53 high-IQ adults<br>64 high-IQ/ADHD adults | Quantitative | High-IQ adults with ADHD reported lower quality of life, poorer familial and occupational functioning, more functional impairments, and increased comorbidities |
| Baum et al. (1998) | 1 ADHD male | Qualitative | Environmental conditions may cause or influence ADHD-like behaviors in high-ability students |
| Baum and Olenchak (2002) | 1 ADHD, ODD, GAD, and mild unevenness in skill development male | Qualitative | Provided guidelines for careful diagnosis and a diagnostic matrix |
| Brown et al. (2009) | 157 high-IQ/ADHD adults | Quantitative | High-IQ/ADHD adults were found to suffer from executive functioning impairments at significantly higher rates than the general population |
| Chae et al. (2003) | 106 gifted children<br>71 nongifted children | Quantitative | Children identified as gifted made fewer omission and commission errors and responded more consistently on the T.O.V.A. than children with lower intelligence; gifted children with ADHD had fewer omission and commission errors and better response sensitivity than nongifted children with ADHD |
| Cramond (1994) | 3 ADHD boys | Qualitative | Boys with ADHD diagnosis exhibited high levels of creativity on the Torrance tests of creative thinking |
| Hartnett et al. (2004) | 44 graduate students | Quantitative | Diagnosis of giftedness can inhibit the diagnosis of ADHD |
| Kalbfleisch (2000) | 17 controls<br>17 ADHD subjects | Quantitative | Gifted/ADHD males were more impaired than average-aptitude subjects with ADHD, only shifting attention from reading to Torrance tests for creative-thinking figural forms |
| Montgomery (2007) | 9 gifted/ADHD males | Mixed methods | Data from the individual, parents, and teachers show that ADHD affected the daily experiences of these students and giftedness may mask an individual's disability, making diagnosis difficult |
| Moon et al. (2001) | 3 ADHD/gifted boys<br>3 AHDD boys<br>3 gifted boys | Qualitative and quantitative | Gifted/ADHD boys had more emotional difficulties than gifted and ADHD-only boys; high ability does not serve as a protective factor against social difficulties in students with ADHD |
| Shaw and Brown (1991) | 51 high average+ females<br>46 high average+ males | Quantitative | Stable characteristics (such as high figural creativity, more mixed laterality, more allergies, and more use of nonverbal and poorly focused information) were associated with individuals with high intelligence and ADHD |
| Zentall et al. (2001) | 3 ADHD boys<br>3 gifted boys<br>3 ADHD/gifted boys<br>9 parents and teachers | Qualitative and quantitative | Giftedness did not provide protection from the negative outcomes of ADHD but provided benefits toward fostering specific talents |
| Treatment and interventions | | | |
| Leroux and Levitt-Perlman (2000) | 1 gifted/ADHD male | Qualitative | Careful consideration of individual profiles for designing interventions for ADHD/gifted students; recommendations for future study regarding implications for learning, educational strategies, and predicting long-term outcomes |
| Liu et al. (2005) | 2 gifted/ADHD male | Qualitative | Pediatricians can aid in the identification, support, guidance, and advocacy of children with ADHD and a high IQ |

Note: ADHD = attention deficit/hyperactivity disorder; IQ = intelligence quotient; ODD = oppositional defiant disorder; GAD = generalized anxiety disorder; T.O.V.A. = Tests of Variable Attention.

suggested that first-year graduate students in counselor education were ill prepared to dually identify ADHD and giftedness. While this study explored issues of understanding gifted and/or ADHD symptoms, counselor educators are not diagnosticians, nor are first-year graduate students within any discipline ethically able to make a diagnosis. Nevertheless, professionals conducting comprehensive evaluations of gifted students with ADHD should be aware of the impact of cognitive ability on assessments that typically measure ADHD. For example, computerized measures of attention may underidentify gifted students with ADHD. Chae et al. (2003) demonstrated that gifted students with ADHD performed better than children with ADHD on the Tests of Variable Attention (T.O.V.A.), which is a computer-based measure of attention and concentration. Therefore, diagnosticians should be aware that a gifted student may in fact have diagnostic ADHD even if he or she does not score at diagnostic levels on a standardized measure of attention. As well, assessment of executive functioning skills should be included in the test battery given that they are often impaired in gifted individuals with ADHD (Brown, Reichel, & Quinlan, 2009).

One study was uncovered that took a neuroscience approach to examining gifted students with ADHD. Through examining the Consistency Index, a measure of electroencephalography, Kalbfleisch (2000) found that high-ability students with ADHD had greater difficulty shifting attention on creativity tasks than other students with ADHD, yet the Consistency Index scores did not correlate with IQ. It is not yet known whether such imaging techniques demonstrate ADHD symptom differences based on ability and how these investigations will add to the larger field of neuroscientific examination of ADHD.

*Treatment and interventions.* Although there are hundreds of studies examining the effectiveness of various treatment and intervention methods for students with ADHD (the largest being the Multimodal Treatment Study of children with ADHD; MTA Cooperative Group, 1999), few have directly assessed their usefulness for gifted students with ADHD; thus, only some suggestions provided in the literature have been based on empirical research. What has been recommended is to take a careful, individualized approach to each student's needs to determine the appropriate course of treatment (Leroux & Levitt-Perlman, 2000). Results from case studies research (Flint, 2001; Leroux & Levitt-Perlman) provide guidance for future study, including identifying gifted/ADHD characteristics, suggesting diagnostic measures that effectively identify both exceptionalities, developing strategies for best practices in education, identifying the prognosis for future successful treatment, and frequent reassessment by a multidisciplinary team to make appropriate recommendations based on the child's changing needs.

## Twice-Exceptionality: Academically Gifted Students With ASD

As with ADHD, there is a wide body of clinical and educational literature examining diagnostic and intervention strategies for individuals with ASD (Klin, Volkmar, & Sparrow, 2000). Among higher functioning individuals, the exact etiology is unknown, yet evidence suggests genetic (Gillberg & de Souza, 2002) and neurochemical underpinnings (Szatmari & Brenner, 1989), as well as the existence of comorbid conditions (Loveland & Tunali-Kotoski, 2005). Several specific clinical, neuropsychological, and neurobehavioral features also have been identified in higher functioning individuals (e.g., social, executive functioning, motor difficulties, etc.; Rinehart, Bradshaw, Brereton, & Tonge, 2004). Increasing attention is being paid to treatment and intervention, as well as to the heterogenitiy of symptom presentation and how it affects treatment outcome (Khouzam, El-Gabalawi, Pirwani, & Priest, 2004).

Some have suggested that cognitively and academically gifted children may have similar characteristics as those with ASD, including an intense focus on certain subjects, uncooperative behavior, and difficulty making friends (Cash, 1999; Gallagher & Gallagher, 2002). This leads one to question whether some children are diagnosed as either having ASD or being gifted, when, in fact, they should be identified as gifted with ASD. With proper assessment, including measures that evaluate intelligence, behavior, and social skills, the differences between a gifted child without ASD and a twice-exceptional child become clearer (Assouline, Foley Nicpon, & Doobay, 2009). Such twice-exceptional children's unique needs and challenges should be considered when developing their systems of support.

Before a gifted child with ASD can receive appropriate accommodations, there must be thorough identification of both exceptionalities. Yet it is not common for professionals to be trained in the diagnosis of ASD and identification of cognitive and/or academic giftedness. Huber (2007) cites eight students in whose cases "application of idiosyncratic diagnostic rules led to an ASD diagnosis being initially ruled out" (p. 129). This points to the importance of collaboration among psychologists and educators: School personnel almost always determine if a student is gifted and talented, but it takes a psychologist, psychiatrist, or another trained mental health professional to complete the twice-exceptional classification by appropriately diagnosing an ASD (Henderson, 2001).

Furthermore, it is important to avoid the perception that impressive performance in individuals with ASD is a result of their abnormal neuroanatomical functions rather than genuine intellectual ability (Dawson, Soulieres, Gernsbacher, & Mottron, 2007), which serves to pathologize rather than encourage and foster intellect and talent.

**Table 3.** Empirical Studies Related to Gifted/ASD Students

| Reference | Participants | Methodology | Main Findings |
|---|---|---|---|
| Assouline and Foley Nicpon (2007) | 207 classroom teachers, gifted education specialists, school psychologists, and other educators | Quantitative | Large percentages of classroom teachers and school psychologists had a passing familiarity with or were not aware of twice-exceptionality |
| Assouline et al. (2008) | 18 ASD/gifted students | Quantitative | There were discrepancies between very superior GAI scores and average to low-average processing speed, working memory, and fine motor skills |
| Assouline et al. (2009) | 2 intellectually gifted girls, one with ASD and one without ASD | Case study | Illustrated similarities and differences between a gifted student and a twice-exceptional student |
| Foley Nicpon et al. (2010) | 54 ASD/gifted students, their parents, and their teachers | Quantitative | Aspects of psychosocial functioning were affected in gifted students with ASD; developmental differences in severity may exist |
| Huber (2007) | 10 intellectually gifted students who were diagnosed with Autistic Disorder, Asperger's syndrome, or Pervasive Development Disorder – Not Otherwise Specified | Quantitative | Empirical evidence for the twice-exceptional child: Students with very superior verbal and nonverbal reasoning skills also demonstrated social and communication skills comparable with children with ASD |

Note: ASD = Autistic Spectrum Disorder; GAI = General Ability Index.

## *Empirical Review*

Although there is a great deal of theoretical and anecdotal evidence describing the increasing numbers of gifted students with ASD, we unveiled *5 empirical studies* that have been conducted in the past 20 years (see Table 3). The first of these studies was Huber's (2007) research examining the cognitive profiles and diagnostic histories of 10 intellectually gifted students who were diagnosed with Autistic Disorder, Asperger's syndrome, and Pervasive Developmental Disorder—Not Otherwise Specified. She found that although these children had superior to very superior verbal and nonverbal reasoning skills, their social and communication skills were comparable with children diagnosed with ASD from the Autism Diagnostic Observation Schedule (ADOS) standardization sample, providing empirical evidence for the existence of the twice-exceptional child. Specifically, 8 of the 10 children scored at the very superior level on the Perceptual Reasoning Index (PRI) and the Verbal Comprehension Index (VCI) of the Wechsler Intelligence Scale for Children (WISC-IV; Wechsler, 2003). Five out of 7 children exhibited above-average skills in math, reading, and written language on the Woodcock-Johnson Test of Achievement (WJIII ACH; Woodcock, McGrew, & Mather, 2001). The participants in Huber's (2007) study were a part of the Iowa Twice-Exceptional Project, a Javits grant–funded program through the Iowa Department of Education and the Belin-Blank International Center for Gifted Education and Talent Development. Preliminary results from a pilot group of gifted students with ASD recruited through this project were reported in Assouline, Foley Nicpon, Colangelo, and O'Brien (2008). The cognitive ability–testing results of 18 gifted students with ASD suggest that, while the mean GAI was in the 97th percentile, the students' processing speed and working memory mean scores were in the average range. Similarly, achievement test results showed high performance in math and language (math problem-solving skills and language composition skills in the 95th percentile), whereas basic skills tasks that were timed tended produce average scores.

One of the main issues educators face when working with a gifted student with ASD is how to meet their academic needs while accommodating for their behavioral, social, and emotional concerns. Yet recent research demonstrates that many educational professionals have limited knowledge about how to implement the necessary accommodations that address areas of educational talent (Assouline et al., 2009). Assouline and Foley Nicpon (2007) found that only 6.4% of the school psychologists surveyed knew the specific guidelines for gifted education services, and 46.8% had only a passing familiarity with or no awareness of such services. Indeed, Huber (2007) found that while 9 of the 10 twice-exceptional students in her empirical study received special education services, only 4 received gifted education services. Furthermore, 2 of the children were not permitted to take part in their schools' gifted programs (Huber, 2007). Although the social skills issues of some intellectually gifted children dissipate when they are challenged and placed in appropriate classes, it is not sufficient just to provide academic challenge to twice-exceptional children, for that would address only part of the problem. Foley Nicpon,

Doobay, and Assouline (2010) found that, according to parent reports, gifted students with ASD tended to have elevated scores on the Atypicality, Attention Problems, Depression, Hyperactivity, Withdrawal, Activities of Daily Living, Adaptability, and Social Skills scales of the Behavior Assessment System for Children, second edition (BASC-2; Reynolds & Kamphaus, 2004). Although the researchers found that adolescents presented fewer symptoms than children, all subjects demonstrated difficulty in social situations (Foley Nicpon et al., 2010).

In their case study comparing a girl with intellectual giftedness and no ASD diagnosis and a girl who was both intellectually gifted and diagnosed with ASD, Assouline et al. (2009) demonstrated the intersections and divergences between twice-exceptional children and their non–dually diagnosed peers. Illustrated here were the Type B student (who experiences social difficulties because she is in an environment that is not suited to her gifted abilities) and the Type C student (who is gifted and has a social skills–based disability). Their case study portrayed two students whose cognitive performances are nearly identical, whereas their social and adaptive behaviors are dramatically divergent. Through intelligence, behavioral, and social measures, the case study illustrated the similarities and differences among gifted students with and without ASD. Specifically, Assouline et al. (2009) found that the gifted student with ASD had significantly more difficulties with activities involving working memory, visual scanning skills, fine motor dexterity, and cognitive processing. On the ADOS, the gifted student with ASD had greater psychosocial symptoms. These case studies, as well as the case studies in the Huber (2007) study, reinforce the notion that a comprehensive evaluation must be conducted to parse out the nuances of the gifted student with ASD.

### *Summary and Conclusions From the Empirical Review*

In the past 20 years, a total of *43 empirical studies* have examined twice-exceptionality in the specific areas of learning disability, ADHD, and/or ASD. Of these, the majority assumed a qualitative research stance, and few examined twice-exceptionality from an empirically rigorous lens. Furthermore, the methods of diagnosing twice-exceptionality varied, which makes comparison of results across studies difficult. This summary of the extant research points to the need for future empirical investigation where there is a sound, replicable methodology with clearly stated inclusion and exclusion criteria. There is a call for additional quantitative analyses that offer evidence for the effective identification and treatment of twice-exceptionality.

In spite of these limitations, the results of this research clearly demonstrate that twice-exceptionality exists: Gifted students can have a coexisting disability. The results also suggest that there is no single, diagnostic twice-exceptionality profile that one can discover through the administration of psycho-educational assessment tools; however, patterns exist that could alert professionals to consider both of these possibilities (i.e., the same student could have an academic or cognitive gift and a disability). At the same time, some, but not all, twice-exceptional students may experience coexisting psychosocial difficulties. Only a comprehensive evaluation can identify individual strengths and areas of growth so that appropriate programming and intervention can be designed. Less is known about empirically validated treatments and interventions for twice-exceptional students. There is an apparent and immediate need to fill this void.

Scholars who study twice-exceptionality must draw on the already existing research within the broader diagnostic categories of SLD, ADHD, and ASD to ensure that the questions asked are relevant and timely. Cross-discipline approaches must be employed to access, incorporate, and build on relevant research from other domains, such as special education, neuroscience, school psychology, and counseling psychology. This requires consideration of more complex methodologies that involve larger sample sizes, randomized controlled studies, and neuroimaging techniques. Through this lens, scholars will begin to better understand the ways in which high ability affects disability. This is necessary to ensure that twice-exceptionality is included in the larger discussion of disability in general.

## Recommendations for Future Research

The results from this review of twice-exceptional research provide several recommendations for future investigators. The first and most crucial recommendation is to conceptualize a research agenda within the context of the larger body of clinical and educational literature examining the identified disability and talent domain. For example, before a researcher designs a social skills intervention study for gifted students with ASD, he or she must first thoroughly study the existing social skills intervention literature to determine what has already been deemed effective with high-functioning students with ASD. Another example is within the exploding field of neuroscience (Gilger & Hynd, 2008). Researchers are using magnetic resonance imaging (MRI) and functional magnetic resonance imaging (fMRI) to study the brains of people diagnosed with ASD (Kalbfleisch & Iguchi, 2008). Some of this research examines the brain functioning of those with and without ASD while they perform cognitive tasks (Dichter & Belger, 2007; Kana, Keller, Minshew, & Just, 2007). Because of the large distribution of cognitive ability among those with ASD, it is important to understand whether differences vary in relationship to cognitive functioning or whether differences exist when individuals are working within their identified talent domains.

A second recommendation for twice-exceptionality researchers is to examine each diagnosis or exceptionality

individually. This clearly is no easy task given the high rate of comorbidity among various diagnoses, but investigating "twice-exceptionality" in general misses the vast differences between the disabilities. Effective diagnostic practices and intervention strategies will vary depending on the diagnosis. Third, what constitutes "giftedness" needs to be operationalized. There is nothing simple about this recommendation given that no consistent definition exists within the field. Yet without standardization of what it means to be academically or cognitively gifted (with or without a coexisting disability), it is difficult to generalize findings and thus build the body of empirical work. A fourth, and related, recommendation is to consider studying twice-exceptionality among various types of giftedness. As is the case with diagnoses, there are many varieties of giftedness, and the response to intervention may vary depending on the area of student strength. For example, a visually creative student with ADHD likely would respond differently to an intervention than a student talented in verbally based domains. Fifth, there needs to be further exploration into the "masking" phenomenon to verify its existence. One method would be to conduct a broad-based survey of professionals to identify the risks for misdiagnosis, misidentification, and mistreatment (Baum & Olenchak, 2002). Sixth, consider increasing the sample size. This too is tricky given that the prevalence of twice-exceptionality is relatively low and identification is complex, but increased sample sizes will make analyses more powerful and results more influential for states or districts planning to enact positive change in their schools. Seventh, professional training programs should include education about high-ability students and twice-exceptionality, specifically how high-ability students can and do manifest various diagnoses. Eighth, longitudinal studies should be conducted to understand further the outcomes for children with various forms of twice-exceptionality (Antshel et al., 2007; Antshel et al., 2008).

### *Intervention Studies*

Final recommendations for researchers concern treatment interventions; this research agenda must be a priority. Currently, few, if any, gifted students with SLD receive special interventions to address their giftedness as well as their disability (Crim et al., 2008). For gifted students with ADHD, it is not known whether high ability affects treatments that are typically effective for children with ADHD alone (such as best practices for medication intervention and social/emotional skills training; Antshel et al., 2007; Antshel et al., 2008; Leroux & Levitt-Perlman, 2000). Ideas from the extant literature suggest why gifted children with ASD might struggle in gifted classrooms (e.g., difficulty with large projects, trouble with unstructured activities), yet empirical studies are needed to identify effective types of accommodations (including the way directions are presented, the sort of classwork assigned, and the types of exchanges students are expected to have with their peers). It is imperative that researchers and educators work together to create and evaluate programs that encourage these students to develop their strengths as they navigate through school with a coexisting diagnosis or disability.

As noted previously, some programs have demonstrated benefits for gifted students with SLD (Olenchak, 1995, 2009), and others show potential. They include a curriculum developed through Project High Hopes (Baum, Cooper, & Neu, 2001), which was designed with the understanding that twice-exceptional students must be able to use their strengths of creativity, problem-solving skills, and analytic ability in order to benefit educationally. Another example is the program developed through Maryland's Montgomery County Public Schools (Weinfeld et al., 2002), where gifted students with severe learning disabilities learn in special classrooms (Center Programs) that are geared toward "developing strengths; providing classroom organization that is flexible and collaborative to maximize goal-setting, self-direction, group discussion, self-reflection, problem solving, and self-evaluation; and providing curriculum and instruction that is inquiry-based with a thinking focus" (p. 228). Research examining the effectiveness of these and other similar programs is necessary so that program implementation and replication can be widespread.

Although they are beneficial and needed, school-based interventions recommended for working with twice-exceptional students, including assistive technology such as calculators, computers, and voice recognition software (Baum et al., 2001; Nielsen, 2002), are not enough. Examining the empirical evidence of their effectiveness would bolster the likelihood of their use, but they continue to address only the students' areas for growth. Twice-exceptional students must be in learning environments that help them work with both their weaknesses and their gifts. This may be done by giving students the opportunity to meet and work with other twice-exceptional students like them (Nielsen, 2002) and to discuss workable compensation strategies while making progress in their talent domains (Beckley, 1998; Reis et al., 2000).

## Summary and Conclusions

In general, gifted students are lauded by society, whereas children with disabilities can be misunderstood or ostracized. The twice-exceptional child must navigate both kinds of feedback, an undoubtedly disorienting experience. A solution to this is to introduce a supportive and strengths-based approach to all aspects of the twice-exceptional student's life. In the classroom, in extracurricular activities, and at home, it is important to provide the student with opportunities to use her or his high abilities. So that the characteristics associated with the disability or disorder do not interfere with positive experiences, teachers and parents ought to consider ways in which they can ease the stressors or environmental triggers that tend to amplify the areas of difficulty.

Educators and parents are called on to explicitly model accepting and affirmative behavior toward the twice-exceptional student so that this strengths-based model can be actualized. By creating an inclusive environment for twice-exceptional children, gifted education will indicate that it recognizes that strengths and contributions can come from a multitude of sources.

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## Bios

**Megan Foley Nicpon**, PhD, is an assistant professor in the Counseling Psychology Program at the University of Iowa, as well as a licensed psychologist and Supervisor of Psychological Services at the Belin-Blank Center for Gifted Education and Talent Development. Her research interests include assessment and intervention with twice-exceptional students, particularly gifted students with autism spectrum disorder, as well as the psychosocial/emotional needs of gifted and talented students. Her clinical specialties are in providing assessment and consultation services for gifted and twice-exceptional students, including those with autism spectrum disorder, attention deficit hyperactivity disorder, emotional difficulties, and/or learning disabilities.

**Allison Allmon**, BA, is a third-year doctoral student at the University of Iowa in Counseling Psychology. Her research interests include twice-exceptionality, posttraumatic growth, and diagnostic disclosure. She is currently involved in a follow-up study to the Iowa Twice Exceptional Javits Project where she is exploring issues surrounding choosing to disclose diagnosis to children as well as the affects of assessment as an intervention. In addition, she is in the process of developing a study exploring posttraumatic growth in pediatric burn survivors.

**Barbara Sieck** is a third-year PhD student in the Counseling Psychology Program at the University of Iowa. Her research interests include psychosocial functioning of gifted children with autistic spectrum disorder.

**Rebecca D. Stinson**, MEd, is currently a fourth-year doctoral student in counseling psychology at the University of Iowa. She received her MEd in counseling psychology from the University of Missouri–Columbia. Her research interests include family systems, twice-exceptionality, and gender roles.