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Twice-Exceptional Learners: Who Needs to Know What?

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Abstract

Twice-exceptionality is gaining increasing recognition in the gifted education literature but little is understood about the knowledge and awareness of this concept within the educational and psychological community, or about professionals' experience working with this population of learners. Three-hundred and seventeen individuals completed an online *Twice-Exceptional Needs Assessment*, which consisted of 14 questions assessing issues pertaining to twice-exceptionality knowledge and experience, as well as knowledge of policies relevant to both gifted and special education. Results indicated that educators were more familiar with standards within their specific area of expertise (e.g., gifted or special education) and that fewer professionals were familiar with the use of Response to Intervention with twice-exceptional children. Gifted education professionals had significantly more knowledge and experience with twice-exceptionality than did professionals in other domains. We conclude with implications for educators and recommendations for expanding professional understanding of twice-exceptionality outside the field of gifted education to meet twice-exceptional students' multifaceted needs.

Keywords

multivariate analyses, quantitative methodologies, assessment, twice-exceptional, special populations/underserved gifted

The term *twice-exceptional* has only recently entered educators' lexicon as a way to describe a gifted learner with a coexisting disability (Assouline, Foley Nicpon, & Huber, 2006; Assouline & Whiteman, 2011). The educational concept of having high ability, or "gifted," was independently brought to the national educational forefront in 1972 by the federally commissioned Marland Report. Although there were no legal mandates associated with the report, it was influential in revealing *some* of the characteristics and needs of gifted students. The Marland report also made a significant contribution to establishing a federal definition of giftedness, which is still apparent in many of the state definitions. The next year, Section 504 of the Rehabilitation Act (1973) mandated that students with disabilities be provided with accommodations to create equal educational opportunities for all. In 1975, the rights of students with disabilities to receive a free and appropriate public education (FAPE) were recognized through Public Law 94-142, which was renamed the Individuals with Disabilities Education Act (IDEA) in 1990. Despite the fact that all of these initiatives were at the federal level, they were disconnected. The needs of gifted students with disabilities were not mentioned in the Marland Report, nor was the possibility that individuals with disabilities may have significant cognitive strengths (i.e., be gifted) mentioned in Section 504 of the Rehabilitation Act (1973), in PL 94-142 (1975), or the 1990 reauthorization of PL 94-142 (IDEA).

Almost 30 years after the passage of PL 94-142, the regulations for the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA-2004) recognized that children who are gifted and talented may also have disabilities. Concurrent to the reauthorization of IDEA-2004, the Jacob K. Javits Gifted and Talented Students Education Program, which until 2011 when it was eliminated was the only funding specially earmarked for gifted students, invited proposals for research projects to address the Javits Absolute Priority to "carry out a coordinated program of scientifically based research to build and enhance the ability of elementary and secondary schools nationwide to meet the special educational needs of gifted and talented students" (U.S. Department of Education, n.d., "Program Description," para. 1). A small number of Javits-funded projects have focused on twice-exceptionality, and national programs and schools are devoted to improving the learning needs of twice-exceptional students (e.g., Bridges Academy in California, the Belin-Blank Center's National Institute for Twice-Exceptionality, etc.). Unfortunately, empirical investigation of twice-exceptionality remains sparse (Foley

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Nicpon, Allmon, Sieck, & Stinson, 2011), and educational professionals' knowledge and experience with this population is limited. For example, Assouline and Foley Nicpon (2007) reported that among gifted educators, regular educators, and school psychologists, the gifted educator is considered to be in the best position to advocate for the twice-exceptional student. More recently, Robertson, Pfeiffer, and Taylor's (2011) survey of 300 school psychologists from across the nation uncovered that only 39.86% reported moderate to considerable familiarity with the concept of twice-exceptionality, whereas 60.14% had little to no familiarity.

The purpose of the current study was to expand on the findings of Assouline and Foley Nicpon (2007) and Robertson et al. (2011) to gain a better understanding of the current knowledge, awareness, and experience concerning twice-exceptionality as reported by educational professionals familiar with gifted education. Assessing educators' knowledge and awareness is important because of their influence on practice (Fullan, 2007; Tomlinson, 2003); educators' knowledge and experience about twice-exceptionality may likely be related to their ability to recognize a twice-exceptional student and design an appropriate curriculum. Therefore, this study was a preliminary exploration of these understandings, experiences, and beliefs among educational professionals with some familiarity with gifted learners.

The Nexus of Education and Psychology

Assouline and Whiteman (2011) presented a cogent discussion regarding the connection between the psychologically based diagnosis of many disabilities and implications for interventions in educational settings. The situation is complicated by many nuances; however, four aspects are most salient to the rationale for our research. First, many of the disabilities are determined by a psychologist (clinical, counseling, or school) who is likely to use a noneducational system of determining presence of various disability characteristics. Second, IDEA is oriented toward FAPE; therefore, although a psychologist may make the diagnosis, an educator—or other support staff, for example, a speech therapist—is likely the professional who will implement the psychologist's recommendations. Third, giftedness has no absolute or universal definition or programming format. Finally, with the advent of Response to Intervention (RtI) as a framework for many school psychologists working in the field (King, Coleman, & Miller, 2011), increased understanding of this construct as it applies to twice-exceptional students is warranted. All of these issues contribute to confusion about what twice-exceptionality is, how often it occurs, and how it interfaces with current service provision in schools.

Prevalence

A commonly asked, yet difficult to answer, question regarding twice-exceptionality is related to prevalence. How many children are twice-exceptional? Practices for identifying gifted children vary substantially across and within states, but estimates are that gifted children constitute 5% to 20% of the general school population (National Association for Gifted Children, n.d., "Frequently Asked Questions," para. 2; Pfeiffer, 2001). Of these children, some states track how many also have a coexisting Individualized Education Plan (IEP) or 504 Accommodations. For example, in the state of Iowa, 2.8% of all students identified as gifted (9.6% of the student population) also have an IEP or 504 Plan (Iowa Department of Education, 2011). This number likely is artificially low, however, because many twice-exceptional students' abilities and/or disabilities may not be formally identified in school settings (Assouline & Whiteman, 2011; Foley Nicpon et al., 2011). This being said, best estimates of prevalence range from 300,000 (Baum & Owen, 2004) to 360,000 (National Education Association, 2006). Clearly there is a need to more accurately document prevalence in U.S. schools.

Types of Twice-Exceptionality

The 1990 reauthorization of the original 1975 federal legislation, PL-94-142, included 13 disability categories (Sattler, 2008), which have remained largely unchanged. In 2012, a 14th category, "Deafness," was added (National Dissemination Center for Children with Disabilities, n.d., "Categories of Disability Under IDEA"). Importantly, the category, "Mental Retardation," was renamed, "Intellectual Disability." It is significant to note that the IDEA service model is grounded in FAPE principles and based on student eligibility for services.

For our survey, we focused on four disabilities: autism spectrum disorders (ASD); specific learning disabilities (SLD); attention deficit hyperactivity disorder (ADHD), which is included in the IDEA category of "other health impairments"; and emotional disturbances (ED). We are not saying that other disability categories are irrelevant to the discussion. Rather we focused on these four because of the availability of research literature (Foley Nicpon et al., 2011), the frequency of the diagnosis in schools (e.g., SLD and ADHD are the largest categories), increased incidence rate (e.g., ASD), or the area in gifted education that receives considerable attention (e.g., ED) because of concerns about unevenness of development (e.g., academic vs. social-emotional development).

Response to Intervention

Specific learning disabilities were of particular interest to us given that the changes in the IDEA-2004 regulations permitted the use of RtI as an option to the traditional ability-achievement discrepancy model of identification. Originally considered within the realm of special education, RtI is increasingly being discussed as an educational reform for all

students, including the gifted and talented (Coleman & Hughes, 2009; Coleman & Johnsen, 2011; King et al., 2011). Because of this recent attention to RtI among gifted educators, we considered it important to gather information about educators' awareness of RtI, as well as its application to twice-exceptional populations.

Research Questions

The main purpose of *The Twice-Exceptional Needs Assessment Survey* was to determine educational professionals' familiarity with gifted education, as well as knowledge and awareness about twice-exceptional students. Specific research questions were as follows:

Research Question 1: What is the general level of understanding about twice-exceptional students, related to policies and practices, among professionals with some familiarity with gifted education?

Research Question 2: What experience do professionals with some familiarity with gifted education have with twice-exceptional students?

Research Question 3: What beliefs do professionals with some familiarity with gifted education adhere to relative to practices and difficulties related to twice-exceptional students?

Method

Participants

The sample was derived from a pool of professionals and parents contacted through two gifted education electronic listservs. The rationale for this study sample was to determine the knowledge and awareness of, and experience with, twice-exceptional learners within the population of educators and psychologists familiar with gifted education. Individuals who identified as classroom teachers, gifted education specialists, school administrators, school counselors, licensed psychologists, certified school psychologists, or special education teachers were eligible and encouraged to participate. The listserv is focused on the needs of educators and other professionals. That being said, no one is denied access to the listserv and membership includes some parents; however, we specifically stated that the survey was for educational professionals only and parents were not included in the invitation to respond to the survey. There were approximately 2,500 individuals who subscribed to these lists, but the number of parent versus professional members is unknown. Additionally, we indicated that individuals could forward the email to professionals they know in the field. We sent one original call for participation, then two reminder emails, each 1 month after the original solicitation. The survey was also posted on our website. Therefore, we offer a conservative estimate of 2,000 professionals who saw at least one call for participation, and 317 completed the survey. Our estimated response rate was therefore 16%. This response rate is consistent with some estimates of total response rates of 13% for online surveys (Hamilton, 2003), but lower than other estimates of approximately 24% (Sheehan, 2001). Online survey response rates vary significantly and have declined in recent years (Hamilton, 2003; Sheehan, 2001), but our percentage falls within the range of what has been reported for these types of surveys (Hamilton, 2003; Sheehan, 2001).

Survey Instrument

The *Twice-Exceptional Needs Assessment Survey* (see the appendix) was administered electronically through SurveyMonkey. This program has the ability to preserve respondents' confidentiality, and survey responses were considered anonymous. The Survey consisted of 14 questions designed to gauge educators' and psychologists' awareness of and experience with twice-exceptionality. Four questions focused on demographic information and seven were asked to obtain data about familiarity with special education, gifted education, RtI, and twice-exceptionality; experience with various populations of twice-exceptional students; confidence about and factors to consider when making educational referrals for twice-exceptional students; the best support person for twice-exceptional students; estimated prevalence; and primary areas of difficulty observed in twice-exceptional students. Familiarity was asked using a 4-point Likert-type scale (0-3) ranging from "no" familiarity to "specific" familiarity. Experience and confidence also were asked using a 4-point Likert-type scale (0-3) ranging from "none" to "extensive," and "not confident at all" to "very confident." Three open-ended questions assessed for knowledge of in- and out-of-school interventions for students who are twice-exceptional and provided an option to add any information relevant to twice-exceptionality. The responses to open-ended questions were not analyzed for this article.

Data Analysis

Descriptive statistics for the Likert-type scale items were used for this investigation of twice-exceptionality knowledge, awareness, and experience among education professionals. We ran a series of ANOVAs (Welch tests) to analyze professional group differences in familiarity, experience, and confidence about making educational referrals.

Results

Individuals from 40 states completed the survey. The largest representation was from Iowa (24.6% of the sample), followed by Ohio (4.1%), Virginia (4.1%), and Florida (3.8%).

Nineteen (6%) individuals from outside the United States completed the survey, but they were removed from all subsequent analyses because of the very small sample size. The majority ($n = 93$, 31.2%) said that their primary professional role was a gifted education specialist, followed by classroom teacher ($n = 56$, 18.8%), licensed psychologist ($n = 33$, 11.1%), special education teacher ($n = 25$, 8.4%), school administrator ($n = 19$, 6.4%), school counselor ($n = 8$, 2.7%), and school board member ($n = 1$, 0.3%). Sixty-three (21.1%) identified their primary role as "Other." Participants were prompted to explain "Other," but because of a computer error, these responses were not recorded by the SurveyMonkey program. This was a computer error within our university's system; multiple attempts were made to gather the information but none were successful. However, we hypothesize that many of the individuals in this category identified as someone working within an educational or psychological environment and therefore included them in the analysis. The majority ($n = 102$, 34.2%) stated that they worked with students K-12, followed by 85 (28.5%) identifying as working primarily with elementary school populations, 59 (19.8%) with middle school populations, 40 (13.4%) with high school populations, and 6 (2.0%) with preschoolers. Six (2.0%) did not report their educational population affiliation. Information regarding race, age, and years of experience was not asked.

Descriptive Statistics

Table 1 lists the descriptive data regarding familiarity with various educational services and specific classifications of twice-exceptional students. The majority of respondents indicated having some to specific familiarity with federal and state guidelines for special education services, their state's position on RtI as a model for special education, and their state's guidelines for gifted education services. Regarding their state's position on RtI as a model for gifted education, about a third had some familiarity while another third had no familiarity. Respondents also were familiar with the overall concept of twice-exceptionality, as well as with specific types (gifted students with ADHD, ASD, emotional difficulties, or learning disabilities). However, they noted less experience with various populations of twice-exceptional students. Specifically, the majority of respondents reported some to moderate experience with gifted students with ADHD (70.7%), ASD (64.0%), emotional difficulties (70.6%), or learning disabilities (62.5%). Despite indicating less experience with these specific groups, participants' confidence in making appropriate referrals for additional services was relatively high (37.2% responded feeling "very confident"; 40.2% reported feeling "somewhat confident"; 17.9% said they were "not very confident"; and 4.7% were "not confident at all"; mean = 2.10, $SD = 0.856$).

Next, participants were asked to rank-order specific factors to consider when making a referral for an evaluation of twice-exceptionality: behavioral difficulties in the classroom, outside activities, parental concerns, peer relationships, performance on class tests, performance on class work, performance on the Cognitive Ability Test (or a similar ability test), and performance on the *Iowa Tests of Basic Skills* (or a similar achievement test). We calculated the percent that each factor was ranked 1 through 8 to determine the mean rank value; these percentages are provided in Table 2. Next, we converted the ranked data and made variables to know which ranks participants gave for each referral source. For easier comparison, we gave the converting value 8 for first rank and 1 for eighth rank. Therefore, a mean value of 5.75 can be interpreted that participants gave a rank between third (= value 6) and fourth (= value 5) on average. Results were that performance on class work most often was ranked first ($M = 5.75$) followed by behavioral difficulties in the classroom ($M = 5.64$), parental concerns ($M = 5.15$), performance on Cognitive Ability Test ($M = 4.69$), performance on class tests ($M = 4.25$), peer relationships ($M = 4.17$), and performance on *Iowa Tests of Basic Skills* ($M = 3.84$). Outside activities had the lowest mean ranking of 2.63, indicating that it was most often ranked as the least important consideration when making referrals for evaluation of twice-exceptionality.

Gifted education specialists were overwhelmingly identified as the best choice for providing support to the twice-exceptional learner ($n = 120$, 40.3%), which was followed by the classroom teacher ($n = 53$, 17.8%). Forty-three individuals (14.4%) responded "other" and then provided comments about what was specifically meant by this response. A review of these comments suggest that the majority (33%) believed the gifted and special education teachers together should provide support, followed closely by the team approach (30%), which would include various combinations of professionals (classroom teachers, special educators, gifted teachers, and/or guidance counselors). Additional responses indicated that it would depend on the specific child (22%) and the final set of comments (15%) was too variable to fall under one coherent theme. The remaining choices were special education teacher ($n = 42$, 14.1%), parent ($n = 21$, 7.0%), psychologist ($n = 10$, 3.4%), school counselor ($n = 5$, 1.7%), and school administrator ($n = 1$, 0.3%). Three individuals did not complete this item.

To gain feedback about estimated prevalence, participants indicated what percentage of gifted students they believed were also twice-exceptional. A large percentage (39.9%) indicated that prevalence was between 1% and 5%; 26.5% estimated prevalence to be higher—between 6% and 10%; a notable 24.5% felt it was 11% or higher. Only 7.4% indicated that twice-exceptional students make up less than 1% of the gifted population. Five individuals did not complete this item.

Table 1. Familiarity With Educational Services and Twice-Exceptionality, and Experience With Twice-Exceptional Students.

Item	Familiarity (%)				Mean	*SD*
	Specific	Some	Passing	No		
Federal/state guidelines for special education services	**45.0**	**45.0**	8.7	1.3	2.34	0.69
Your state's position on RtI as a model for special education services.	**35.6**	**37.6**	15.1	11.7	1.97	0.99
Your state's guidelines for gifted education services	**54.7**	**28.7**	11.5	5.1	2.33	0.87
Your state's position on RtI as a model for gifted education services	20.0	**29.2**	18.3	**32.5**	1.37	1.14
Twice-exceptionality	**46.5**	**35.0**	11.1	7.4	2.21	0.91
Gifted students with ADHD	**49.3**	**35.8**	9.8	5.1	2.29	0.84
Gifted students with ASD	**38.9**	**38.5**	13.5	9.1	2.07	0.94
Gifted students with emotional difficulties	**40.1**	**41.5**	12.9	5.4	2.16	0.85
Gifted students with learning disabilities	**45.3**	**34.1**	13.2	7.4	2.17	0.93
Item	Experience (%)				Mean	*SD*
	Extensive	Moderate	Some	None		
Gifted students with ADHD	21.5	**39.4**	**31.3**	7.7	1.75	0.88
Gifted students with ASD	13.8	**35.7**	**28.3**	22.2	1.41	0.98
Gifted students with emotional difficulties	21.6	**39.2**	**31.4**	7.8	1.75	0.88
Gifted students with learning disabilities	22.1	**32.2**	**30.3**	15.1	1.61	0.99

Note. Values of 28% and above are in bold. ADHD = attention deficit hyperactivity disorder; ASD = autism spectrum disorders; RtI = Response to Intervention.

Table 2. Percent Rankings of Important Considerations for Referral.

Options	Rank 1 (%)	Rank 2 (%)	Rank 3 (%)	Rank 4 (%)	Rank 5 (%)	Rank 6 (%)	Rank 7 (%)	Rank 8 (%)
Behavioral difficulties	26.5	18.0	15.8	7.3	7.9	7.9	4.4	7.9
Outside activities	1.3	2.8	5.4	6.6	6.6	16.7	15.8	38.2
Parental concerns	13.6	14.2	12.6	18.6	16.4	10.4	6.3	2.8
Peer relationships	2.8	8.2	14.8	15.5	15.8	16.7	14.8	5.7
Class test performance	2.2	9.8	16.4	13.6	18.0	13.9	12.9	7.9
Class work performance	23.0	17.7	12.6	17.4	9.8	6.0	4.4	3.8
Ability test performance	19.6	10.7	8.8	9.8	10.7	9.8	16.1	8.8
Achievement test performance	6.6	13.6	8.5	6.3	9.8	12.3	18.3	18.3

Participants were asked what they considered the primary area of difficulty among twice-exceptional learners. The most common area reported was social problems with peers (n = 93, 31.2%), followed by coordination of care among professionals working with the student (n = 69, 23.2%), academic difficulties (n = 61, 20.5%), school personnel coordination with parents (n = 13, 4.4%), and social problems with adults (n = 11, 3.7%). Forty-three (14.4%) marked "other," and responses fell into three general areas. The first was behavioral and emotional concerns (32%), which encompassed classroom behavioral difficulties, self-esteem, anxiety, frustration, and disorganization. The second most common area was concerns with identification or qualification for services (18%); the third was being misunderstood by others in the education environment (8%). The remaining responses were too diverse to place into a general topic and included a wide range of ideas, such as inappropriate expectations for students, teacher biases, and scheduling issues.

Group Comparisons

Four groups were compared across *Twice-Exceptional Needs Assessment Survey* items: classroom teachers (1T, n = 56), gifted education specialists (2G, n = 93), psychologists (3P, n = 33), and special education teachers (4S, n = 25). Because the remaining professional groups had too few respondents to include in the analyses, data from 91 individuals were not used.

Means and standard deviations among the four groups on the familiarity and experience items are presented in Table 3. To assess the differences between the professional groups, mean scores of dependent variables were compared by the Welch test. The Welch procedure is equivalent to

Table 3. Familiarity With Educational Services and Twice-Exceptionality, and Experience With Twice-Exceptional Students by Group.

	Means by group				Standard deviation by group			
Familiarity item	1T	2G	3P	4S	1T	2G	3P	4S
Federal/state guidelines for special education services	2.14	2.13	2.71	2.96	.44	.78	.57	.19
Your state's position on RtI as a model for special education services	1.68	1.77	2.46	2.44	.83	1.04	.95	.70
Your state's guidelines for gifted education services	2.02	2.86	1.89	1.93	1.01	.51	.90	.78
Your state's position on RtI as a model for gifted education services	1.04	1.66	1.29	1.12	1.00	1.10	1.14	1.11
Twice-exceptionality	2.04	2.44	1.94	1.81	1.00	.62	.97	1.18
Gifted with ADHD	2.21	2.46	2.11	2.33	.96	.61	.90	1.00
Gifted with ASD	1.88	2.24	2.00	1.96	1.04	.83	.97	1.19
Gifted with emotional difficulties	2.00	2.30	2.09	2.15	.93	.64	.92	1.12
Gifted with learning disabilities	1.88	2.26	2.09	2.44	1.02	.78	1.01	.89
	Means by group				Standard deviation by group			
Experience item	1T	2G	3P	4S	1T	2G	3P	4S
Gifted with ADHD	1.75	1.95	1.57	1.52	.90	.74	.98	.94
Gifted with ASD	1.13	1.49	1.57	1.26	.94	.87	.98	1.02
Gifted with emotional difficulties	1.51	1.86	1.77	1.50	.89	.78	1.00	.95
Gifted with learning disabilities	1.28	1.72	1.63	1.81	.90	.91	1.09	1.00

Note. ADHD = attention deficit hyperactivity disorder; ASD = autism spectrum disorders; RtI = Response to Intervention; 1T = teachers; 2G = gifted education specialists; 3P = psychologists; 4s = special educators.

ANOVA, but takes into account that our population variances differed significantly and group sample sizes were not equal (Cribbie, Fiksenbaum, Keselman, & Wilcox, 2012). Welch tests were used for all but the familiarity of guidelines for special education item because one group had no variance in responses; specifically, all special educators said they had familiarity with special education guidelines. Therefore, the traditional *F* statistic was reported for this item. For similar reasons, pairwise post hoc comparisons were computed with the test of Games–Howell to control for the probability of increasing Type I error. The Games–Howell test does not need homogeneity of variances and is recommended in cases of unequal sample sizes.

Table 4 lists the overall and post hoc comparisons for the familiarity and experience questions according to group. The overall ANOVA for the federal and state guidelines for the special education question was statistically significant, and post hoc analyses suggested that psychologists and special educators were more familiar with the guidelines than were teachers and gifted education specialists. The overall ANOVA for the question regarding use of RtI in special education was also statistically significant. Post hoc analyses revealed a similar pattern of psychologists and special educators being more familiar with RtI as it is applied in special education than were classroom teachers and gifted education specialists. Regarding familiarity with federal and state guidelines for gifted education, the overall ANOVA was statistically significant; post hoc analyses demonstrated that gifted education specialists were more familiar with these guidelines than were teachers, psychologists, or special educators. Similarly, the overall ANOVA was statistically significant for the familiarity with RtI for gifted populations item, with post hoc analyses indicating that gifted education specialists were more familiar with this concept than were classroom teachers.

The ANOVA testing overall differences in familiarity with twice-exceptionality was significant. Post hoc analyses suggested that gifted education specialists were more familiar with the concept of twice-exceptionality than were psychologists. ANOVAs analyzing familiarity with specific types of twice-exceptionality (gifted with ADHD, ASD, emotional difficulties, or learning disabilities) were not statistically significant, with the exception of learning disabilities, but effect sizes were negligible and none of the post hoc analyses were significant. Two Welch test ANOVAs for experience with specific types of twice-exceptionality (gifted with ADHD and specific learning disabilities) were significant, yet effect sizes were very low. No post hoc analyses were significant for the gifted with ADHD experience question, but post hoc analyses of the gifted with learning disabilities question suggested that the gifted education specialists had more experience with these students than did the classroom teachers.

Group comparisons were also made regarding participants' confidence about making an appropriate referral to

Table 4. Group Comparisons: Familiarity With Educational Services and Twice-Exceptionality, and Experience With Twice-Exceptional Students.

	Overall comparison					Post hoc comparisons (Games–Howell *p* values)					
Familiarity item	*F*/Welch *F*	*df*1	*df*2	*p*	n^2	1T-2G	1T-3P	1T-4S	2G-3P	2G-4S	3P-4S
F/S guideline for SE	21.27	3	203	.000	.24	.962	.000	.000	.000	.000	.043
RtI for SE	10.63	3	79.73	.000	.12	.804	.000	.001	.002	.005	.984
F/S guideline for GE	39.22	3	59.64	.000	.32	.000	.765	.910	.000	.000	.992
RtI for GE	5.36	3	72.59	.002	.07	.001	.622	.995	.387	.091	.867
Twice-exceptionality	5.48	3	64.92	.002	.07	.057	.883	.937	.021	.140	1.00
Gifted w/ ADHD	2.43	3	66.18	.073	.03	.337	.873	.993	.103	.842	.829
Gifted w/ ASD	2.08	3	69.73	.111	.03	.124	.991	.967	.394	.766	.997
Gifted w/ ED	1.99	3	65.41	.125	.03	.146	.999	.839	.399	.974	.991
Gifted w/ LD	2.84	3	70.91	.044	.05	.079	.899	.077	.632	.817	.382
	Overall comparison					Post hoc comparisons (Games–Howell *p* values)					
Experience item	Welch *F*	*df*1	*df*2	*p*	n^2	1T-2G	1T-3P	1T-4S	2G-3P	2G-4S	3P-4S
Gifted w/ ADHD	3.41	3	69.37	.022	.05	.504	.581	.652	.064	.131	1.00
Gifted w/ ASD	2.21	3	71.84	.094	.03	.082	.228	.892	.998	.799	.812
Gifted w/ ED	2.66	3	69.25	.055	.04	.048	.782	.998	.769	.373	.929
Gifted w/ LD	2.82	3	72.40	.045	.03	.028	.646	.250	.834	1.00	.916

Note. 1T = teachers; 2G = gifted education specialists; 3P = psychologists; 4S = special educators; ADHD = attention deficit hyperactivity disorder; ASD = autism spectrum disorders; RtI = Response to Intervention; SE = special educators; GE = gifted education specialists; ED = emotional difficulties; LD = learning disabilities.

assess for twice-exceptionality. The overall Welch ANOVA was not statistically significant, $F(3, 72) = 2.328$, $p = .082$.

Discussion

Gifted learners who have coexiting disabilities are present in schools across the nation, but are educators aware of them, can they recognize who they are, or meet their complex needs? This national survey sought to offer insight into answers to these important questions. Among our sample of respondents, most reported a level of familiarity, which ranged from "some" to "specific," with guidelines for special education and gifted education, as well as their state's position on use of RtI as a service delivery model for special education. Analyses by professional group demonstrated that respondents were (understandably) more familiar with guidelines specific to their professional identity. For instance, special educators and psychologists were more familiar with special education guidelines and RtI than were gifted educators and general education teachers, and gifted education specialists were more familiar with gifted education guidelines than all other groups. Fewer participants were familiar with RtI as a model for gifted education, despite its increasingly large presence in the field (Coleman & Johnsen, 2011; National Association for Gifted Children & Council of State Directors of Programs for Gifted, 2011), yet gifted education teachers were more familiar with the model for gifted education than were general education teachers. Because twice-exceptional students have both special and gifted education needs, it seems prudent that professionals working with this population become familiar with both sets of guidelines, and that interventions are properly researched and understood before they are implemented (Assouline & Whiteman, 2011).

It is encouraging that those who completed our survey were overwhelmingly familiar with the general concept of twice-exceptionality, as well as specific ways it can manifest (e.g., gifted with ASD, ADHD, learning disabilities, or emotional concerns). However, group comparison results uncovered that gifted educators were more familiar with twice-exceptionality than were psychologists, which corroborates other scholars' calls to expand professional development opportunities for those outside of our field (Robinson, 2012). Materials are publically available to aid in these efforts (e.g., Assouline, Foley Nicpon, Colangelo, & O'Brien, 2008; Foley Nicpon, Assouline, Colangelo, & O'Brien, 2008). Despite a generally high level of familiarity among participants, experience working with specific subgroups of twice-exceptional learners was mainly ranked as "some" to "moderate." Positively, respondents were fairly confident in their ability to make appropriate referrals for additional evaluation of a student's exceptionalities.

We also asked participants to rank-order specific factors they believed were important to consider when making a referral for a twice-exceptional evaluation. Performance on

classroom work was the factor ranked first, followed by behavioral difficulties in the classroom. Performance on standardized and classroom tests and engagement in outside activities were perceived as less important in the decision-making process. It is interesting that performance on assessments was not ranked higher among participants, given that schools almost always include standardized test scores in the gifted and talented program identification process (Borland, 2009; Lakin & Lohman, 2011). Yet results from previous studies also have demonstrated variability in perceived value of test scores in gifted identification (Schroth & Helfer, 2008), and this may extend to perceptions of twice-exceptional identification. Perceived value, however, needs to be carefully weighed with validity. That is, even if teacher observations of class work and behavior have higher perceived value in twice-exceptional identification, it may not be that they are also more valid indicators. There are ways to standardize teacher observations (Hunsaker, 2012; Westberg, 2012), which increases validity of the data obtained. Examples of empirically supported teacher observations include the Scales for Rating the Behavioral Characteristics of Superior Students (Renzulli et al., 2010), the Scales for Identifying Gifted Students (Ryser & McConnell, 2004), and the Gifted Rating Scales (Pfeiffer & Jarosewich, 2003).

Twice-exceptional students by definition would seemingly need support from both gifted and special education, but we were also interested in learning who participants felt were in the best position to provide support for these learners. Participants overwhelmingly said that gifted education specialists were the best choice, possibly because gifted education teachers represented the majority of the sample (31.2%). It may also be that gifted education professionals seemingly have the greatest understanding about twice-exceptionality in general (Assouline et al., 2008) or that those individuals outside of gifted education who felt less familiar with twice-exceptionally did not rank themselves as individuals who could provide the best support. Finally, it may be that gifted education specialists are perceived as being aware of a need to develop the student's talent domain in addition to providing remediation for his or her disability, more so than others in the student's environment. Many respondents indicated "other" and in the corresponding comment section of the survey, they suggested a team approach was best. Researchers also support utilizing a team approach (Assouline & Whiteman, 2011; King et al., 2011); however, this was not among the choices offered, which was a limitation.

As noted in the introduction, acquiring exact prevalence rates for twice-exceptionality is not possible given a multitude of factors, but existing estimates are that they constitute 2% to 5% of all gifted learners (National Education Association, 2006). Our results were consistent with this figure. The majority of participants estimated that students represent 1% to 10% of all gifted learners, adding support for current prevalence estimations. Thus, twice-exceptionality is a common enough phenomenon that furthering professional knowledge and awareness in and out of gifted education is warranted.

Next steps would be to access the effectiveness of identified interventions for specific classifications of twice-exceptional learners. Garnering this information would be helpful toward implementing policy changes in favor of funding for twice-exceptional learners who would benefit from gifted education (Stephens, 2011). Although knowledge and awareness of the population may have increased, our educational system is far from adequately addressing these students' multifaceted needs.

Implications for Educational Professionals

Based on the results of this survey, educators of the gifted have two charges. First, although knowledge of twice-exceptionality among the sample appears adequate, there may exist an underlying inadequacy in our educational system to deal with the complexity that twice-exceptional students bring to our schools, and a lack of experience in dealing with specific exceptionalities. For example, one should consider the emotional issues present when a student is identified as gifted and diagnosed with a disability. As such, a team of professionals, headed by a well-informed individual and including teachers, psychologists, and counselors, is needed to create programs that truly address the needs of twice-exceptional children (Trail, 2011). Another example involves addressing twice-exceptional students' needs through an RtI model (Coleman & Johnsen, 2011). Although this is a potentially beneficial new application for RtI, it is important to consider from a research perspective the capability of the model to address students' strengths as well as their disability before it is implemented in schools.

The second charge is for gifted educators to facilitate professional development opportunities regarding twice-exceptionality for those outside the field. Specifically, the results of this needs assessment elucidated that gifted education teachers know more about twice-exceptionality than regular education teachers, and this was even among teachers who either subscribed to gifted education email lists or had gifted education specialists as colleagues. Because twice-exceptional students interact with all educational professionals—not just gifted educators—we need to do a better job of disseminating information regarding their unique strengths and potential areas for growth. Increased competence regarding twice-exceptional students' needs is a first step toward valid identification and programming for this group of learners.

Limitations and Future Directions

The *Twice-Exceptional Needs Assessment* survey was the first to take a national look at familiarity and experience

with twice-exceptional students among professionals familiar with gifted education. This was accomplished through soliciting participants via gifted education listservs where members likely receive many survey research requests. As a result, our response rate was low and we did not have a diverse sample that included a large number of professionals outside gifted education. This is the biggest limitation to the study because those who subscribe to gifted education email lists are potentially more knowledgeable and positive about twice-exceptionality. Future researchers should attempt to secure a more representative and diverse sample of professionals who interact with twice-exceptional learners by posting on special education lists, general education lists, and lists for psychologists who work in the schools. For example, would special educators recognize twice-exceptional students and refer them for gifted education services? This is an important question that could be answered by acquiring a more representative sample of professionals who encounter twice-exceptional students. Additionally, most of our respondents came from one state; thus, they may not be representative of twice-exceptionality knowledge and awareness in areas of the country where this concept is less well-known. Response-rate problems plague survey research and limit one's ability to make causal inferences or generalizable statements. An increased response rate would reduce bias and increase our ability to formulate conclusive statements from this data. While this is a limitation, our study focused on determining whether those familiar with gifted education are also attuned to the possibility of disabilities, and our results show they are. Our findings do, however, suggest that twice-exceptionality is a concept more readily accepted in gifted education than in other specialties. Increasing dissemination of professional development materials, research findings, and training opportunities to individuals outside of gifted education is a logical next step to widening awareness of this population of students.

A second limitation is the nature of the research study; survey research does not allow one to make causal inferences and is limited in terms of how these data can be analyzed. It is also not possible to verify the accuracy of self-report data obtained through survey research. Future studies may wish to sample educators' behavior toward twice-exceptional children in the classroom, or observe students' experiences in classrooms with educators who report varying levels of familiarity and experience. A third limitation was that we only surveyed professionals (i.e., teachers, psychologists, counselors). It would be helpful to know twice-exceptional students' and their parents' perceptions of their educational experience. Fourth, an error in the SurveyMonkey program resulted in no data gathered concerning who constituted the "other" group. Even though this group would not have been used in the subgroup analyses because of the diversity of membership, it would have been helpful to know their self-reported professional identities. Finally, the results of the study suggested potential revisions of the survey for future research studies.

Conclusion

As a field, gifted education is becoming more familiar with the concept of twice-exceptionality and educators are gaining more experience working with this population. This is good news, but it is not enough. Continued attention must be paid to extending professional development opportunities to professionals outside gifted education so that the needs of the twice-exceptional are adequately met throughout their educational careers. This study provides important information about awareness of twice exceptionality within a sample of educational professionals who work with gifted students.

Appendix

Twice-Exceptional Needs Assessment Survey

Individual responses to this survey will remain anonymous.

Thank you very much for completing this brief survey. **Please complete this survey only once.**

1. State of residence:
2. What describes your <u>main</u> professional responsibilities?
   - ○ Classroom Teacher
   - ○ Gifted Education Specialist
   - ○ School Administrator
   - ○ School Counselor
   - ○ Licensed Psychologist (School, Clinical, Counseling)
   - ○ Special Education Teacher Special Education Teacher
   - ○ School board member
3. Other Please specify: [ ]
   - ○ What best describes the population of students with whom you work?
   - ○ Prekindergarten
   - ○ Elementary (K-5)
   - ○ Middle School/Junior High (6-8)
   - ○ High School (9-12)
   - ○ All students (K-12)
4. Please indicate the licensures and/or endorsements you currently have: (Please check all that apply.)
   - ☐ Classroom Teacher
   - ☐ Gifted Education Specialist
   - ☐ School Administrator
   - ☐ School Counselor
   - ☐ Psychologist (School, Clinical, Counseling)
   - ☐ Special Education Teacher
   - ☐ Other Please specify: [ ]

5. How familiar are you with the following?

	Specific familiarity	Some familiarity	Passing familiarity	No familiarity
Federal/state guidelines for *special education* services	○	○	○	○
Your state's position on Response to Intervention (RtI) as a model for *special education services*.	○	○	○	○
Your state's guidelines for *gifted education services*	○	○	○	○
Your state's position on Response to Intervention (RtI) as a model for *gifted education services*	○	○	○	○
Twice-exceptionality (gifted students who have learning difficulties and/or social impairments)	○	○	○	○
Gifted students with Attention-Deficit/Hyperactivity Disorder (ADHD)	○	○	○	○
Gifted students with Autism Spectrum Disorder (ASD)	○	○	○	○
Gifted students with emotional difficulties (anxiety, depression)	○	○	○	○
Gifted students with learning disabilities (math, reading, etc.)	○	○	○	○

6. How would you describe your experience in working with the following populations?

	Extensive experience	Moderate experience	Some experience	No experience
Gifted students with ADHD	○	○	○	○
Gifted students with ASD	○	○	○	○
Gifted students with emotional difficulties (anxiety, depression)	○	○	○	○
Gifted students with learning difficulties (math, reading, etc.)	○	○	○	○

7. How confident are you that your current understanding of and experience with twice-exceptional students enables you to make appropriate evaluation referrals of twice-exceptional students?
   - ○ I am very confident that I would appropriately refer twice-exceptional students.
   - ○ I am somewhat confident that I would appropriately refer twice-exceptional students.
   - ○ I am not very confident that I would appropriately refer twice-exceptional students.
   - ○ I am not confident at all that I would appropriately refer twice-exceptional students.
8. Please ***rank order from 1 to 8*** the following factors you think should be considered in order to make appropriate referrals for evaluation of twice-exceptionality? *Let 1 be the most important and 8 be the least important.*

Behavioral difficulties in the classroom	1
Outside activities	1
Parental concerns	1
Peer relationships	1
Performance on class tests	1
Performance on class work	1
Performance on CogAT (or similar ability test)	1
Performance on ITBS (or similar achievement test)	1

9. Who, in your opinion, is usually the best choice to provide primary support for the twice-exceptional student?
   - ○ Classroom Teacher
   - ○ Gifted Education Specialist
   - ○ School Administrator
   - ○ School Counselor
   - ○ Psychologist (School, Clinical, Counseling)
   - ○ Special Education Teacher
   - ○ Parent
   - ○ Other Please specify: ____
10. What percentage of gifted students in your state do you estimate are twice-exceptional?
    - ○ Less than 1%
    - ○ 1%-5%
    - ○ 6%-10%
    - ○ 11%-15%
    - ○ Greater than 15%
11. What is the primary area of difficulty that you observe for twice-exceptional students?
    - ○ Academic difficulties
    - ○ Social difficulties with peers
    - ○ Social difficulties with adults
    - ○ School personnel coordination with parents
    - ○ Coordination of care among professionals working with the student

12. In your state, what in-school interventions (e.g., assistive technology, tutoring, enrichment classes) exist for students who are twice-exceptional?
13. In your state, what out-of-school interventions (e.g., assistive technology, social-skills groups, enrichment classes) exist for students who are twice-exceptional?
14. Is there any other information relevant to twice-exceptional students that we should know?

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