Factors relating to education professionals' classroom practices for the inclusion of students with autism spectrum disorders

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A B S T R A C T
It is essential to understand the current practices used to foster inclusive education for students with autism spectrum disorders (ASDs) as well as factors related to the implementation of classroom interventions. In the current study authors assess the experience, knowledge, attitudes and current practices of education professionals regarding ASD. Results suggest that special education teachers and school psychologists hold higher levels of experience, training, and knowledge as compared to general education teachers and administrators. Attitudes towards inclusive education for students with ASD were positive, in general, although attitudes were not a significant predictor of awareness or use of empirically supported interventions. Implications and future directions are discussed.

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1. Introduction

Educating students with autism spectrum disorder (ASD) in public schools is a significant challenge (Robertson, Chamberlain, & Kasari, 2003; Yell, Katsiyannis, Drasgow, & Herbst, 2003), due in large part to core features, substantial heterogeneity of symptom presentation, and an array of associated behaviors and challenges (Eaves & Ho, 1997; Hendren, 2003). In recent years, more students with ASD have been educated in general education settings rather than in segregated environments, a practice generally referred to as inclusion (White, Scallon, Klin, Koenig, & Volkmar, 2007).

A growing body of research has documented the experiences of students with ASD in inclusion settings. For example, Boutot and Bryant (2005) reported on the peer nomination ratings of 177 elementary school students, including ten students with ASD who were educated in regular education classrooms. Results suggested that there were no significant differences between students with ASD and their typically developing peers on measures of social preference, social impact, or social network affiliation. Whereas similar findings have been reported elsewhere (Robertson et al., 2003), other research has suggested that peer attitudes towards a child with autism viewed on videotape were significantly less positive than attitudes towards a typical peer (Campbell, Ferguson, Herzenzinger, Jackson, & Marino, 2004; Swaim & Morgan, 2001). Still other research using peer nomination methods indicates that, although children with ASD are part of the larger social network, their involvement in that network is less than typical peers, particularly in terms of reciprocity, companionship, and acceptance (Chamberlain, Kasari, & Rotheram-Fuller, 2007).

Ochs, Kremer-Sadlik, Solomon, and Sirot (2001) used ethnographic observation methods and video recordings to qualitatively explore the experiences of 16 students with ASD in inclusion settings. Their findings suggest that, across the...
classrooms observed, there exist both positive inclusion practices, such as peers patiently helping students with ASD or providing corrective feedback, and negative inclusion practices, such as ignoring students with ASD or displaying open disrespect.

In order to assist teachers in educating students with ASD in inclusive settings, authors have summarized inclusion practices for students with autism (e.g., Harrower & Dunlap, 2001), recommended guidelines for the inclusion of students with Asperger’s syndrome (e.g., Jordan, 2005; Williams, 1995), and summarized empirically evaluated treatments for persons with ASD (e.g., Simpson et al., 2005). These recommendations are numerous, and it is beyond the scope of this paper to review the various interventions appropriate for inclusive classrooms (e.g., environmental adaptations, instructional techniques, social skills interventions, general behavior management strategies). Given the focus of the present investigation, teacher variables, which are identified in the summary works as important to successful inclusion, will be explored in depth.

### 1.1. Teacher variables

Teacher disposition and behavior are identified consistently as important to successful inclusion (e.g., Burack, Root, & Zigler, 1997). Beyond generally accepted personality traits, such as kindness and patience, experts suggest that teachers be predictable, consistent and concerned with social development in addition to academic gains to create a successful inclusion experience for students with ASD (Safran & Safran, 2001). Due to difficulties with general social competence (Gutstein & Whitney, 2002), teachers should be vigilant in protecting their students with ASD from teasing and bullying (Griffin, Griffin, Fitch, Albere, & Gingras, 2006; Williams, 1995) and should act as social translators in the classroom (Safran, 2002). It may also be necessary for teachers to both prompt students with ASD to engage in appropriate behavior and prompt peers to initiate social interactions with students with ASD (Odom & Watts, 1991).

Consistent with these suggestions is the recommendation that teachers of students with ASD be knowledgeable about the disorder itself (Jordan, 2005) and the various practice options and strategies that will facilitate inclusion for the individual student (Dahle, 2003; Fisher, Frey, & Thousand, 2003). Indeed, recent education laws suggest that teachers receive specialized training so that they are highly qualified to educate students with ASD (Yell, Drasgow, & Lowrey, 2005; Yell et al., 2003). Some efforts have been made to assess the knowledge base of teachers and other education professionals about ASD. Early research suggested that teachers held incorrect beliefs about ASD, particularly in the realm of cognitive abilities, compared to autism specialists (Stone & Rosenbaum, 1988). Similarly, researchers have indicated that speech–language pathologists report inadequate knowledge of strategies for inclusion (Cascella & Colella, 2004) and require additional training (Schwartz & Drager, 2008). Other studies suggest that education professionals, such as administrators, special education teachers, and general education teachers, demonstrate a significant lack of knowledge about ASD, as opposed to incorrect information (Segall, 2007). Further, researchers have found a positive relationship between teacher knowledge, experience with disabilities, and teacher self-efficacy (Buell, Hallam, Gamel-McCormick, & Scheer, 1999).

A fundamental assumption held by many educators and researchers is that the attitude educators hold toward the practice of inclusion is an important determinant of the success of inclusive education for students with ASD (Burack et al., 1997; Segall, 2007). Ajzen’s theory of planned behavior (2001) stresses the importance of attitudes and their relationship with other variables such as behavioral intentions, perception of control, and awareness of the beliefs of influential others. Stanovich and Jordan (1998) used Ajzen’s model to investigate inclusion practices of teachers and found that administrators’ beliefs about inclusion were the strongest predictors of teacher behavior. Interestingly, teacher attitudes did not mediate this relationship.

Prior research has focused on assessing educator attitudes towards inclusion (see Avramidis & Norwich, 2002; Scruggs & Mastropieri, 1996 for reviews). In general, findings from this body of research reveal that educators hold positive attitudes towards the general concept of inclusion (Ward, Center, & Bochner, 1994). There are, however, several variables which influence the opinions of teachers and other education professionals, including type and severity of disability; training and knowledge of disabilities; and contact and experience with disabilities (Avramidis & Norwich; Hannah & Pilner, 1983). Additionally, there are conflicting results within the literature, particularly in their application regarding attitudes towards inclusion for students with ASD.

For example, researchers have demonstrated that type of disability and the presence of a label in a short vignette about a student with disabilities did not affect teachers’ decisions of whether or not to include the student in general education classrooms (Myles & Simpson, 1989). Likewise, Brubaker, Bundy, Winslow, and Belcher (2010) found that, with the exception of visual supports, school psychologists were equally likely to recommend interventions for a child described as having autism or a child with the same behaviors but no diagnostic label.

Both school psychologists (Center & Ward, 1989) and principals (Prausner, 2003) have endorsed that some disabilities are more suitable for inclusion than others. For example, Barnett and Monda-Amaya (1998) found that less than one-third of principals recommended inclusive practices for students with severe disabilities and cognitive disabilities. Other research indicates that principals are more optimistic than special education teachers that students with mild disabilities may benefit from inclusion (Cook, Semmel, & Gerber, 1999), suggesting that views about amenability for inclusion may differ across education professionals, which may be related to training and knowledge of disabilities.

One readily replicated finding is that teachers with special education qualifications report more favorable attitudes towards inclusion than those without special education qualification (Avramidis, Bayliss, & Burden, 2000; Center & Ward,
Accordingly, general education teachers report more need for training on inclusion practices than special education teachers, who also report high self-efficacy related to educating students with disabilities (Buell et al., 1999). Similarly, studies have demonstrated that teachers with greater knowledge of behavioral principles and higher self-efficacy reported more adaptive reactions to the stress of students with challenging behavior (Hastings & Brown, 2002).

Attitudes towards inclusion have improved as a result of an intervention that included a combination of information about disabilities and supervised experience working with students with disabilities (Johnson & Cartwright, 1979), lending support for the contact hypothesis. The contact hypothesis suggests that there is an inverse relationship between experience with a person with disability and negative perceptions of such persons (Corrigan et al., 2001).

Indeed, whereas teachers from schools without inclusive practices report strong negative feelings about inclusion (Vaughn, Schumm, Jallad, Slusher, & Saumell, 1996), teachers from inclusive schools report more positive attitudes towards the practice (Avramidis et al., 2000). Among principals, contact has also been shown to be related to attitudes towards inclusion. For example, Praisner (2003) found a significant positive correlation between experience with disabilities and attitude towards inclusion.

From the current literature, several hypotheses can be made regarding educator attitudes towards inclusion and ASD. In chief, as type and severity of disability have been shown to influence attitudes, it is likely that attitudes towards inclusion of students with ASD would be less positive than other disabilities. Additionally, the relative infrequency of ASDs compared to learning disabilities, for example, may lead educators to report less desirable attitudes. As educators may have had fewer contact with students with ASD, contact theory predicts less positive attitudes towards including them in the general education setting. On the other hand, educators who have special education training and/or specific experience with students with ASD (Robertson et al., 2003) will likely demonstrate stronger positive opinions about inclusion for such students than educators without such training and experience.

Indeed, with respect to ASD, there is a growing body of research evaluating these hypotheses. Cook (2001), for example, assessed teachers’ opinions about students with obvious disabilities (e.g., autism) and hidden disabilities (e.g., attention deficit–hyperactivity disorder). Cook found that teachers were more likely to report feeling indifferent (versus rejection, concern, or attachment) to students with obvious disabilities. Research also suggests that teachers may be unprepared to provide instruction to students with autism (Cook, Tankersley, Cook, & Landrum, 2000; Stoiber, Gettinger, & Geotz, 1998), which may explain the reported indifference. On the other hand, school psychologists with a high level of knowledge of ASD reported neutral opinions about a variety of potential interventions for these students (Brubaker et al., 2010). Similar to other findings, special education teachers in the Stoiber et al. (1998) study reported being significantly more prepared to work with students with ASD than general education teachers. However, across educator types, teachers indicated that autism, as compared to other disabilities such as learning disabilities, will need the greatest degree of accommodations (Stoiber et al., 1998). One study of elementary school principals, the majority of whom had no experience with students with ASD, suggests that these administrators would place students with ASD in general education infrequently and were more likely to place such students in the most restrictive settings at their school (Praisner, 2003).

Other research has presented more optimistic results. In a small study of general education teachers from 12 elementary school classrooms which contained a student with autism, participants reported generally positive relationships with these students (Robertson et al., 2003). Further analysis indicated that this relationship was moderated by the target students’ peer status, such that students with higher status were viewed more positively.

In a study by McGregor and Campbell (2001) both regular education and specialist staff were surveyed about their attitudes towards inclusion of students with ASD. Teachers who reported having experience with a student with autism reported positive attitudes towards the practice, independent of teacher type. In this study, participants indicated that the severity of autism was an important factor for inclusion. Additional research investigating teacher opinions about potential outcomes for persons with ASD suggests that success in school is both an important and likely outcome, yet attaining the highest education possible is viewed as more important than likely (Jvey, 2007).

In efforts to extend this line of research, Segall (2007) sampled administrators, special education teachers, and general education teachers. The results supported the assertion that educators report generally positive attitudes towards inclusive education for students with ASD. Interestingly, whereas attitudes towards inclusion were not found to significantly correlate with other relevant variables (e.g., knowledge of autism), attitude of the staff was identified consistently as the most important factor for successful inclusion. Furthermore, analysis of the knowledge items indicated that education professionals lack a substantial amount of accurate information about autism.

### 1.2. Purpose of the current study

Results suggest that while attitudes towards the practice of inclusion for students with ASD may be positive, a variety of factors related to both student (e.g., severity) and teacher (e.g., experience) affect the strength of these opinions. The aims of the present study are to (a) further assess education professionals’ backgrounds and perspectives in the areas of prior experience working with children with ASD, knowledge of ASD, attitudes towards inclusive education, and classroom practices, and (b) extend the literature specifically regarding school psychologists’ knowledge and attitudes towards inclusion for students with ASD.
The following hypotheses are posed:

(a) Does the experience, training, knowledge and attitudes of education professionals relate to the use of more effective classroom strategies for inclusion? Investigators hypothesize that more experience, more training, greater knowledge, and positive attitudes will relate to the use of more effective classroom strategies.

(b) Do education professionals (e.g., administrators, general education teachers, special education teachers, and school psychologists) differ in their knowledge of ASD and their awareness of classroom strategies? Investigators predict that special education teachers and school psychologists will demonstrate higher knowledge when compared to other professionals.

(c) Do attitudes differ between groups of education professionals? Investigators predict that general education teachers will hold less positive attitudes towards the inclusion of students with ASD than special education teachers, administrators, or school psychologists.

2. Methods

2.1. Participants

Forty-five schools across the state of Georgia were recruited to participate in the study with elementary, middle and high schools recruited in equal numbers. In addition, the department of special education was contacted from each county in which schools have participated, in order to recruit a sample of school psychologists serving the same locations. Seventy-five psychologists were invited to participate in the study. The sample included 33 schools (73% participation rate) located within 15 counties throughout the state of Georgia. Participation within schools ranged from 10% to 100%, with the median participation rate at 50%. Sixty-two questionnaires (41.3% response rate) were completed by elementary school educators; 38 by middle school educators (25.3%); 67 by high school educators (44.6%). In addition, 33 school psychologists participated in the study (44.0% response rate).

In total, 196 (out of 525; 37.3% response rate) education professionals completed the survey. Prior research suggests that this rate of response is acceptable for survey research (Chafouleas, Riley-Tillman, & Sassu, 2006; Warwick & Lininger, 1975). Thirty-nine questionnaires were completed by administrators; 53 by general education teachers; 71 by special education teachers; and 33 by school psychologists. Respondents were primarily women (84%) and Caucasian (91%). Many participants had earned master’s degrees or higher; however, administrators and school psychologists were significantly more likely than general education and special education teachers to hold higher educational degrees, F(3, 191) = 25.6, p < .001. Additional demographic information is presented in Table 1.

2.2. Measure

The Autism Inclusion Questionnaire (AIQ; Segall & Campbell, 2007) was utilized in the present investigation and contains six sections. Items for the Demographic Information section were adapted from the surveys developed by Praisner (2003) and McGregor and Campbell (2001). Three forms of the AIQ, an Administrator Form, a Teacher Form and a Psychologist Form,

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<td>Description of participants.</td>
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<td><strong>Demographic variables</strong></td>
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<td>Special education teacher</td>
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<td>School psychologist</td>
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<td>Certified in special education or school psychology</td>
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<td>Specific ASD training</td>
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<td>Specific ASD experience</td>
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<td>Student with ASD currently in classroom</td>
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*181 participants reported their age.
were created to allow different questions to be posed in the Demographic Information section and appropriate wording and instructions throughout the survey.

The second section, Knowledge of Autism Spectrum Disorders, contains 15 items proposed to measure one’s knowledge of ASD in three areas: diagnosis and symptomatology; treatment; and etiology. Knowledge items were adapted from Stone (1987), Shah (2001), and Furnham and Buck (2003). The questions in this section are presented as True/False statements; in addition, a ‘Don’t Know’ option was included and respondents were instructed to select this response rather than guess.

Section three, Opinions about Inclusive Education, contains Likert-type scale items. Six response choices range from Strongly Agree to Strongly Disagree, and a seventh option, “No opinion or neutral,” is available. On 11 items, respondents evaluate whether various factors (e.g., the severity of disability) are important for successful inclusion. Seven statements measure participants’ attitudes towards inclusion in general and inclusion of students with ASD in particular. Items in this section were adapted from McGregor and Campbell (2001), Furnham and Buck (2003), Praisner (2003), and Stone (1987).

The fourth section, Classroom Behaviors, presents 20 behaviors related to ASD. Participants are asked to rate how disruptive, ranging from Highly Disruptive to Not At All Disruptive, each behavior would be if exhibited by any student in their classroom. Items in this section were adopted from the DSM-IV-TR (American Psychiatric Association, 2000), CARS (Schopler, Reichler, & Renner, 1988), and McGregor and Campbell (2001).

Section five, Classroom Practices, contains a list of 37 strategies, interventions, and practices that may be useful in the inclusion of a student with ASD in the general education setting. These practices were acquired from a variety of sources including Simpson et al. (2005), Alberto and Troutman (2003), and guides for parents and teachers (e.g., Harrower & Dunlap, 2001; Williams, 1995). In particular, 19 interventions are summarized by Simpson et al. (2005) who has rated each practice as “Scientifically Based,” “Promising,” “Limited Supporting Information,” or “Not Recommended.” For each practice in the list, participants are asked to note whether they have heard of a particular practice, whether they have used the strategy, and whether they think it could be effective in better including a student with ASD in the classroom. The final section of the AIQ contains one item offering the participant an opportunity to participate in future research such as focus groups discussing inclusive education for students with ASD.

2.3. Procedure

Packets of materials were mailed to consenting school administrators, containing an instructions sheet, two AIQ – Administrator forms, and eight AIQ – Teacher forms; each AIQ was accompanied by a consent form and a stamped return envelope. Administrators were asked to distribute materials to the appropriate school personnel. In addition, the department of special education from each county from which schools participated was contacted, and sent study materials. In order to increase return rates, three follow-up contacts were made, and four randomly selected participants received a small monetary incentive.

2.4. Data reduction and analysis

Survey data were analyzed using SPSS software. The proposed hypotheses were evaluated using ANOVA and multiple regression procedures. For the purpose of analysis, several total scores were created. An Experience Total Score was calculated by summing a participant’s affirmative responses to having certification (i.e., special education or school psychologist), specific autism training, specific autism experience, and currently having a student with autism special education eligibility in the classroom. Thus, the Experience Total Score could range from 0 to 4. A Knowledge Total Score ($\alpha = .83$) was calculated by summing the number of correct responses to the 15 knowledge items. In addition, the number of ‘Don’t Know’ responses were summed, and a Percent Correct Score was calculated by dividing the Knowledge Total Score by the difference between 15 and the number of ‘Don’t Know’ responses [Percent Correct Score = Knowledge Total Score/([15 – # of Don’t Know]).] Missing data from the Knowledge of ASD section were recoded as ‘Don’t Know’ responses. From the Opinions about Inclusive Education section, seven items comprised an Attitude toward ASD Inclusion Total Score ($\alpha = .68$) with higher scores reflecting more positive attitudes. A Disruptive Behavior Total Score ($\alpha = .93$) was calculated by summing the responses to the 20 items in the Classroom Behaviors section.

Finally, two total scores were calculated based on responses to the Classroom Practices section. An Awareness of Practice Total Score ($\alpha = .91$) was calculated by summing the number of strategies for which participants indicate awareness. A Use of Practice Total Score ($\alpha = .81$) was calculated by summing the number of strategies for which participants indicate current or prior use. Only the 19 strategies discussed in the Simpson et al. (2005) treatment guide were included in this score, and strategies were weighted according to Simpson’s categorization. Thus, use of Scientifically Based Practices was scored as 3; use of Promising Practices was scored as 2; use of Limiting Supporting Information practices was scored as 1; and use of Not Recommended practices was scored as 0.

Of the 196 participants who completed the survey, 19 participants did not complete the AIQ to produce all calculated total scores. In the final data analysis, listwise deletion was used to account for these participants’ incomplete responses.
3. Results

3.1. Relationships between disruptive behaviors, experience, knowledge, attitudes, awareness of strategies, and use of strategies

Correlation analysis revealed significant positive relationships between all total scores except for educators’ perceptions of behaviors (Table 2). That is, greater amounts of experience related to more correct responses to Knowledge items, more positive attitudes, reported awareness of more strategies, and reported use of more effective strategies. All relationships between experience, knowledge, attitudes, awareness of strategies and use of strategies were significant at the .01 level.

Additional analyses were conducted to determine if these relationships differed by educator type (Table 2). Differences in correlations were tested across educator groups with family-wise error corrections, and no statistically significant differences were noted. However, interesting trends emerged. The most striking finding was that attitudes were weakly correlated with other areas for administrators, special education teachers and school psychologists, whereas for general education teachers, attitudes towards inclusion for students with ASD were moderately correlated with knowledge, awareness and use of strategies but not experience. In addition, for school psychologists only three domains were significantly related: disruptive behaviors and knowledge ($r = -.43, p < .05$) experience and knowledge ($r = .40, p < .05$) and awareness and use of strategies ($r = .52, p < .01$).

A multiple regression analysis, in which total scores for Disruptive Behaviors, Experience, Knowledge, and Attitudes (independent variables) were hypothesized to predict Awareness of Practice (dependent variable), suggests that experience, knowledge and attitudes each are significant predictors, accounting for 53% of the total variance. Knowledge alone accounted for 43% of the variance, $b = .66, p < .001$. Due to the group differences shown in the original correlation analysis, independent regression analyses were conducted for each educator group. For administrators, experience was the only salient predictor of awareness of practice, accounting for 17% of the variance, $b = .41, p = .012$. For general education teachers, knowledge and attitudes significantly predicted awareness of practice, accounting for 42% of the variance; knowledge alone accounted for 33% of the variance, $b = .58, p < .001$. For special education teachers, knowledge and experience significantly predicted awareness of practice, accounting for 56% of the variance; knowledge alone accounted for 47% of the variance, $b = .69, p < .001$. Interestingly, there were no significant predictors of awareness of practice within the school psychologist group.

A second multiple regression analysis, in which total scores for Disruptive Behaviors, Experience, Knowledge, and Attitudes (independent variables) were hypothesized to predict Use of Practice (dependent variable). Results revealed that Experience and Knowledge were significant predictors, accounting for 31% of the variance; experience alone accounted for 27% of the variance, $b = .52, p < .001$. As with awareness of practice as an outcome variable, these analyses were conducted separately for each educator group, producing varied results. For administrators, experience was the only salient predictor of use of strategies, accounting for 21% of the variance, $b = .46, p = .005$. For general education teachers, attitudes were the only salient predictor of use of strategies, accounting for 18% of the variance, $b = .42, p = .002$. For special education teachers, knowledge and experience significantly predicted awareness of practice, accounting for 30% of the variance; knowledge alone accounted for 23% of the variance, $b = .48, p < .001$. Interestingly, there were no significant predictors of awareness of practice within the school psychologist group.

3.2. Group differences in knowledge, awareness, and attitudes

Total scores for Autism Experience, Knowledge of ASD, Attitude towards Inclusion of students with ASD, Awareness of Strategies for Inclusion of students with ASD, and Use of Strategies are reported in Table 3. Tukey–Kramer tests were used in post hoc analyses to account for unequal group sizes. No significant group differences were found for disruptive behavior total scores, $F(3, 184) = .55, n.s.$

For the Knowledge Total Score, general education teachers ($M = 5.7, n = 53$) and administrators ($M = 5.5, n = 39$) achieved scores which were significantly lower ($F(3, 191) = 25.3, p < .001$) than both special education teachers ($M = 8.2, n = 70$) and school psychologists ($M = 10.8, n = 33$); however, the scores of general education teachers and administrators did not differ. School psychologists’ knowledge of autism was greater than special education teachers ($p = .001$). For the Awareness of Strategies Total Score, general education teachers ($M = 16.0, n = 52$) and administrators ($M = 17.3, n = 37$) reporting having heard of fewer strategies, $F(3, 188) = 30.0, p < .001$, relating to autism inclusion than both special education teachers ($M = 23.5, n = 70$) and school psychologists ($M = 26.4, n = 33$).

In a pattern similar to the Knowledge Total Score, general education teachers ($M = 6.8, n = 53$) and administrators ($M = 7.2, n = 39$) selected “Don’t Know” responses more frequently than either special education teachers ($M = 3.6, n = 70$) or school psychologists ($M = 1.5, n = 33$), $F(3, 191) = 19.4, p < .001$. On average, the total sample selected “Don’t Know” to five items, and with “Don’t Know” responses accounted for in the Percent Correct Score, participants answered 69% of the items correctly, again with significant group differences, $F(3, 191) = 7.9, p < .001$. Table 4 presents summary data for correct responses and “Don’t Know” responses for each Knowledge item.

Nearly all participants ($n = 178, 92\%$) reported positive attitudes towards autism inclusion as measured by the Attitudes towards Inclusion of students with ASD Total Score (i.e., scores 35 and above); the remaining participants reported attitudes which were neither positive nor negative (i.e., scores between 22 and 34). Although participants viewed inclusive education for students with ASD favorably, in general, group differences were observed, $F(3, 185) = 7.0, p < .001$. Special education
Table 2
Correlations between Total Scores for Disruptive Behaviors (DIS), Autism Experience (EXP), Knowledge of Autism Spectrum Disorders (KNOW), Attitude towards Inclusion of Students with Autism Spectrum Disorders (ATT), Awareness of Practices to Include Students with Autism Spectrum Disorders (AWARE), and Use of Practices (USE).

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<tr>
<td>EXP</td>
<td>.14</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>KNOW</td>
<td>–.12</td>
<td>.38</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>ATT</td>
<td>–.04</td>
<td>.21</td>
<td>.17</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>AWARE</td>
<td>–.05</td>
<td>.53</td>
<td>.69</td>
<td>.29</td>
<td>–</td>
</tr>
<tr>
<td>USE</td>
<td>.16</td>
<td>.44</td>
<td>.51</td>
<td>.17</td>
<td>.74</td>
</tr>
<tr>
<td><strong>School psychologists (n = 31)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>EXP</td>
<td>–.12</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>KNOW</td>
<td>–.43</td>
<td>.40</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>ATT</td>
<td>–.21</td>
<td>.07</td>
<td>–.01</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>AWARE</td>
<td>–.11</td>
<td>.16</td>
<td>.29</td>
<td>–.02</td>
<td>–</td>
</tr>
<tr>
<td>USE</td>
<td>–.02</td>
<td>.21</td>
<td>.03</td>
<td>–.21</td>
<td>.52</td>
</tr>
</tbody>
</table>

*p < .05 (two-tailed).
**p < .01 (two-tailed); lower DIS scores suggest a perception of less disruptiveness.

Teachers’ attitudes (M = 42.2, n = 69) were more positive than either administrators (M = 39.9, n = 39) or general education teachers (M = 38.9, n = 50). On the other hand, while school psychologists’ (M = 41.6, n = 31) and special education teachers’ attitudes did not differ, school psychologists’ attitudes were more favorable than general education teachers, but not administrators. No differences were found between the attitudes of general education teachers and administrators.

Two additional results relating to educator attitudes should be noted. First, of 11 potential factors, participants were in strongest agreement that the attitude of the staff was important for successful inclusion. No educator group differences were

Table 3
Total Scores for Autism Experience (EXP), Knowledge of Autism Spectrum Disorders (KNOW), Attitude towards Inclusion of Students with Autism Spectrum Disorders (ATT), Awareness of Practices to Include Students with Autism Spectrum Disorders (AWARE), and Use of Practices (USE).

<table>
<thead>
<tr>
<th></th>
<th>EXP</th>
<th>KNOW</th>
<th>ATT</th>
<th>AWARE</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrators (n = 39)</strong></td>
<td>.64</td>
<td>5.51</td>
<td>39.90</td>
<td>17.32</td>
<td>6.13</td>
</tr>
<tr>
<td><strong>General education teachers (n = 53)</strong></td>
<td>.91</td>
<td>5.70</td>
<td>38.86</td>
<td>16.02</td>
<td>3.43</td>
</tr>
<tr>
<td><strong>Special education teachers (n = 71)</strong></td>
<td>2.59</td>
<td>8.21</td>
<td>42.16</td>
<td>23.46</td>
<td>10.06</td>
</tr>
<tr>
<td><strong>School psychologists (n = 33)</strong></td>
<td>2.55</td>
<td>10.79</td>
<td>41.55</td>
<td>26.42</td>
<td>9.94</td>
</tr>
<tr>
<td><strong>Total sample</strong> (N = 196)</td>
<td>1.74</td>
<td>7.43</td>
<td>40.72</td>
<td>20.77</td>
<td>7.47</td>
</tr>
</tbody>
</table>

*Note. Data is presented as mean (standard deviation).
* Group differences found for all five total scores, p < .001.
found for this item, \( F(3, 191) = .65, n.s. \) Second, while marginal group differences were found, \( F(3, 191) = 2.9, p = .04 \), such that special education teachers were more in agreement with the statement “All students with an ASD should be included in general education settings” than general education teachers, the majority of participants felt neutral towards this statement (\( M = 4.3, n = 195 \)).

Finally, a mixed model analysis of variance was conducted to determine if educator groups rated potentially disruptive behaviors differentially and if particular behaviors would emerge as more disruptive than others. Using a Huynh–Feldt correction for violation of the sphericity assumption, the within-subjects analysis suggests a main effect for disruptive behaviors, \( F(14.39, 2646.92) = 149.0, p < .001 \). Controlling for family-wise error rates, the level of disruptiveness of specific behaviors was not rated differentially by educator groups. Screaming (\( M = 4.6 \)) and aggression to others (\( M = 4.5 \)) emerged as two of the most disruptive behaviors across all professionals.

4. Discussion

Prior research has documented special teacher attitudes towards students with special education needs and the practice of inclusive education for students with special needs (Avramidis & Norwich, 2002). Only recently, however, have studies specifically investigated attitudes as they apply to students with ASD (Horrocks, White, & Roberts, 2008; McGregor & Campbell, 2001; Segall, 2007). Furthermore, there are a number of domains related to attitudes, such as knowledge, experience, and training, which have not been fully explored in the literature for students with ASD. The purpose of the current study, therefore, was to assess experience and training, knowledge of autism, and attitudes towards inclusive education for students with ASD across various educational disciplines. In addition, the current investigation focused on education professionals’ awareness and use of an extensive list of practices and strategies to promote inclusive education for students with ASD.

Overall, the sample reported favorable attitudes towards the practice of inclusive education for students with ASD, which is consistent with previous research (Avramidis & Norwich, 2002). In contrast, however, participants varied on their attitudes and a number of other related domains such as experience and training, knowledge of ASD, and awareness and use of practice options. Specifically, general education teachers reported the least positive attitudes; although their opinions generally favored inclusion, their ratings were less strong than special education teachers or school psychologists. The difference is consistent with previous research on educator attitudes related to autism (McGregor & Campbell, 2001). As a whole, the participants felt neutral that all students with ASD should be included in general education settings and felt strongly that the attitude of the staff was an important factor in the successful inclusion of a student with ASD.

Differences were observed on measures of knowledge, awareness of practice, and use of strategies across educators. In particular, school psychologists and special education teachers reported higher levels in each of these domains as compared to general education teachers and administrators. The difference suggests a need for adaptations in educator training modules, as administrators, special education teachers, general education teachers, and school psychologists are all charged with effectively implementing the individualized education plans for students with ASD who are educated alongside their typically developing peers.

The domains measured on the AIQ were all related in the direction to suggest increased experience and training relates to more favorable attitudes and more favorable implementation of empirically supported practices. That is, participants with higher levels of experience, knowledge, and awareness of practice options also reported more positive attitudes towards inclusive education and more experience in using empirically validated treatments as outlined by Simpson et al. (2005). While the causal relationship between these variables must be explored in greater depth, regression analyses suggest that
knowledge of autism is a strong predictor of awareness of practice and experience in the area of autism is a strong predictor of the use of empirically supported interventions.

Interesting patterns emerged across groups. Whereas knowledge, experience and attitudes were all positively correlated in the combined sample, these relationships were weakened at the group level. For example, only for general education teachers were relationships between attitudes and knowledge, awareness of practice and use of strategies significant. Also, for school psychologists, only the relationships between behaviors and experience, experience and knowledge, and awareness and use of strategies were significant. Similarly, correlation patterns amongst these domains were different for special education teachers and administrators. One possible interpretation is that the nature of the roles of these education professionals differs in ways that alter the nature of the relationships of these variables. Thus, it may be that for general education teachers, who receive professional training geared towards educating typically developing students, one’s attitude toward inclusive education is a more salient factor than for a special education teacher, in which case knowledge of autism may be more relevant. Results in the current study suggest this may be the case. When awareness of practice and use of empirically supported interventions were viewed as outcome measures, each educator group demonstrated a different relationship among the variables. For example, in the administrator group, experience was predictive of awareness and use of practice, whereas in the general education group, attitudes were the strongest predictors of these domains.

Regarding the relationship of the current study to educator training, it is also important to highlight that the current study suggests that education professionals demonstrated a lack of knowledge and endorsed inaccurate beliefs. For example, general education teachers and administrators responded that they did not know the answer to about seven out of 15 items assessing current knowledge of autism. Moreover, on average, participants reporting having heard of just 21 out of 37 possible strategies to support inclusive education for students with ASD. With “Don’t Know” responses on the knowledge section accounted for, participants on average responded correctly to approximately 70% of the items, suggesting a large number of misconceptions.

Other researchers have found that education professionals endorse a variety of misconceptions about autism, particularly in terms of etiology (Brubaker et al., 2010; Schwartz & Drager, 2008; Stone, 1987). Several of these misconceptions may be worth noting as they provide some commentary on the distinctions between the field of education and other related disciplines. For example, over 70% of respondents reported that the core deficits of ASDs are impairments in social understanding, language and communication, and sensory functioning. While psychiatric diagnosis does not consider sensory abnormalities to be a core deficit of ASD, sensory abnormalities are taken into consideration in terms of assessment for special education eligibility. In addition, about half of the participants in the current study reported beliefs that most children with ASDs are not cognitively impaired and have special talents and abilities. While current studies suggest that the proportions of individuals with both ASD and cognitive impairment are changing (Edelson, 2006), there is not yet consensus that the majority of persons with ASD fall above the cognitive impairment classification. In addition, it is unclear whether the endorsement that the majority of children with ASD have special talents and abilities reflects a strongly held belief of optimism or a misconception that many individuals with ASD are also savants. A conservative conclusion of these findings is that additional training would be advantageous to clarify education professionals’ understanding of these issues.

Content validity for the A1Q knowledge scale was evaluated in two primary ways. First, knowledge items were derived from both previous studies assessing knowledge of ASD and are largely based on the DSM-IV-TR (APA, 2000) description of pervasive developmental disorders. Second, an initial item tryout suggested that researchers and experts in the field of ASD responded with high accuracy to knowledge items. Thus, efforts were made to create a knowledge measure which could accurately assess one’s knowledge of ASD in terms of symptoms and diagnosis, treatment and intervention, and etiology, and the measure appears to be internally reliable.

4.1. Implications

There are several important implications based on the results of the current study. In chief, the relationship between experience, knowledge, and attitudes is a complex one and may differ for various educator groups. For example, while lower levels of knowledge were reported by general education teachers and administrators, as compared to special education teachers or school psychologists, knowledge was a salient predictor of awareness of practice for general and special education teachers but not for administrators or school psychologists. Therefore, in order to maximize the effectiveness of training module reform, the importance of these variables should be taken into account across training programs. In other words, general education teachers may best be prepared to work with students with ASD by infusing additional coursework expanding their knowledge of autism and addressing their opinions about inclusive education for these students; on the other hand, increasing the experience of administrators, in terms of working with students with ASD, may have a more direct effect on their awareness of strategies to support these students. Across all participants in this study, however, experience, knowledge, attitudes were all interrelated, suggesting that the targeting of one area from a training module perspective may indeed have an effect on other domains.

Given the higher levels of knowledge, experience and attitudes reported, both school psychologists and special education teachers would likely be effective trainers of education professionals and consultants regarding inclusive education (Brubaker et al., 2010; Williams, Johnson, & Sukhodolsky, 2005). Teacher training and personnel preparation are clearly needed in the area of autism spectrum disorders (Addison & Lerman, 2009; Morrier, Hess, & Heflin, 2011). High levels of favorable attitudes towards inclusive education for students with ASD in the current sample suggest that the challenge of inclusion may more strongly relate to training models rather than to resistance; although this suggestion may not be true for
school psychologists (Brubaker et al.). Further study of this hypothesis should be explored more fully as knowledge alone does not fully predict behavior (Kennedy, Regehr, Rosenfield, Roberts, & Lingard, 2004).

4.2. Limitations and future directions

One important limitation of the current study is that while the overall sample is larger than the previous study using the AIQ (Segall, 2007), specific group (e.g., administrators) samples were relatively small. Future investigations should increase the sample sizes of educator groups in exploring the replication of these findings. Similarly, samples of additional populations, such as paraprofessionals, student teachers, and parents, should be examined.

Generalization of the current findings is also limited by the regional nature of the sample. Education professionals enrolled in the study may not represent all educators in the United States or in other countries. Further, while the response rate of the current study is acceptable, it is plausible that a response bias exists such that education professionals who lack interest in education of students with ASD or have negative beliefs about inclusive education for these students did not participate in the study.

It cannot be stated that the responses on a questionnaire such as the AIQ cannot measure behavior; without observational data to document teacher behavior and practice, the findings of the present study represent only an estimate of teachers’ training, experience and beliefs. That is, educator report of awareness of practice and use of strategies may not reflect precise understanding and implementation of these interventions and practices. In addition, it is possible that the AIQ may not fully capture all aspects of training, experience and educator beliefs. Future investigations in the area of successful inclusion for students with ASD should incorporate observational data along with measurement of domains assessed by the AIQ in order to portray the most accurate picture of inclusion for students with ASD. Further, it is important to recognize that the autism spectrum is broad and the AIQ lacks specificity in referencing varying profiles of students with ASD. Indeed, analysis of the potentially disruptive behaviors associated with ASD suggests that educators perceive a number of these as “highly disruptive” (e.g., aggression to others). It is quite likely that opinions about inclusive education and the implementation of this practice may be different for students with various profiles along the autism spectrum.

It is interesting that the initial study using the AIQ (Segall, 2007) did not find a significant correlation between attitudes towards inclusion and awareness and use of practice. However, as the direction of the relationship between these constructs was consistent, it is possible that the increased sample size in the present study illuminated the significant strength of these relationships. On the other hand, this disparity in results may relate to the lower levels of internal consistency for the attitudes scale as compared to the other scales generated by the AIQ; that is, it is possible that items on the AIQ are not effectively measuring attitudes towards inclusive education.

Further support for this explanation is found in the high levels of positive attitudes reported by participants. Indeed, 92% of the sample reported attitudes to suggest favorable opinions about inclusive education for students with ASD; no participant reported unfavorable opinions. Accordingly, the lack of variability in response to statements about inclusion for students with ASD may either suggest that education professionals are uniformly in favor of the practice of inclusion or that the AIQ does not effectively measure this domain. Future study measuring the attitudes of education professionals towards ASD appears warranted. In particular, measurement of domains such as affective, conative and cognitive attitudes towards inclusion (Hannah & Pilner, 1983), self-efficacy (Ajzen, 2001) would capture educator beliefs more fully. Specifically regarding the conative attitudes, or behavioral intentions, of an educator, teacher resistance to change and intervention acceptability should be explored.

Alternatively, domains such as experience and knowledge demonstrated adequate levels of internal consistency on the AIQ, and these domains significantly predicted outcomes such as awareness of strategies and use of effective strategies with empirical support. Specifically, knowledge was most predictive of the number of inclusion practices of which education professionals were aware; experience was most predictive of education professionals reported use of treatments categorized by Simpson et al. (2005).

Accordingly, the AIQ represents a potential assessment tool for evaluating educator quality and expertise in the area of ASD. Students with ASD will likely benefit from placement with education professionals who are experienced, are knowledgeable, and report favorable attitudes about a particular student’s placement and potential. Administrators and other educators in leadership positions may benefit from the use of an instrument which can validly assess these domains. The creation and validation of such tools would be an important area for both research and practice.

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References


