

## **Intrusiveness of Behavioral Treatments for Children with Autism and Developmental Disabilities: An Initial Investigation**

Michael R. Mayton  
West Virginia University

Stacy L. Carter  
Texas Tech University

Jie Zhang  
SUNY Brockport

John J. Wheeler  
East Tennessee State University

*Abstract: The behaviors frequently displayed by students with autism can place them at risk for overly reactive behavior interventions with unwanted side effects. The current study examined the level of intrusiveness of behavioral treatments developed for 198 students with disabilities from 13 different states. Results demonstrated that students diagnosed with autism had proportionally more intrusive behavior interventions when compared to students in five other disability categories and indicated that many students with autism were unnecessarily subjected to highly intrusive behavior interventions. The implications of these findings are discussed, and recommendations for future research are provided.*

The intent of the Individuals with Disabilities Education Improvement Act of 2004 (IDEA 2004) with regard to developing behavior interventions and supports is to encourage the use of more proactive strategies to address challenging behavior rather than relying on punishment-based procedures (Etschiedt, 2006). While there is usually a basic understanding of proactive and reactive strategies among professionals, there is no consistent method currently in use for evaluating how appropriate a specific treatment may be when implemented with a specific student in a specific setting, and interdisciplinary teams therefore tend to rely upon group consensus and past professional experience. This may lead educators to overlook how components of behavioral intervention programs could unnecessarily intrude upon the life of a student, limit access to certain environments, cause others to treat the student differently, and even work counter to the initial intent of these

programmatic components. Many of the potential, unwanted influences associated with the implementation of a behavior intervention could be avoided or minimized if a structured method is utilized to evaluate its impact (Carter, Mayton, Wheeler, 2009, 2011). Incorporating some simple procedures to help educators evaluate behavior interventions can minimize the intrusiveness of these procedures for the student and promote aspects of the least restrictive environment by selecting effective, proactive strategies to support appropriate behaviors. In addition, an examination of this type can assist educators in making a clearer distinction between (a) behavioral treatments that are temporarily more intrusive for students due to a maximization of longitudinal, ameliorative potential and (b) those that are more intrusive due to, for instance, a reaction to the unique characteristics of a particular disability diagnosis or a lack of training, experience, or support in working effectively with a particular population of students.

Correspondence concerning this article should be addressed to Michael R. Mayton, Department of Special Education, 508-C Allen Hall, West Virginia University, Morgantown, WV 26506-6122. E-mail: michael.mayton@mail.wvu.edu

### **The Treatment Intrusiveness Construct**

Components of the definition of treatment intrusiveness have included associated measures of social acceptability and the degree to

which participant counter control is established and maintained within treatment programs (Carter & Wheeler, 2005). In general terms, less intrusive treatments tend to be the most socially acceptable and promote the highest levels of counter control for the individuals for whom they are designed. For example, the intrusiveness of a treatment has been said to increase as any or all of the following increase, as a direct result of the application of the treatment (Carter et al., 2009): (a) the use of punishment-based interventions (impacting social acceptability), (b) physical discomfort (also impacting social acceptability), (c) the use of peers to deliver treatment components or enforce rules (impacting counter control), or (d) restrictions on opportunities to resist or escape treatment effects (also impacting counter control). Because many modern programs of behavior change include positive behavior supports, measures of social validity, and team-based, family-centered approaches, they also tend to seek, include, and implement least-intrusive treatments that produce the highest levels of positive, measurable outcomes. However, it has been a historically accepted practice to allow higher levels of treatment intrusiveness in conjunction with more severe levels of problematic behavior (e.g., Foxx & Meindl, 2007; Wachtel, Jaffe, & Kellner, 2011). In addition, the identification of the “least intrusive intervention” is often gauged by comparing, for instance, a treatment’s level of social acceptability with the severity (i.e., in terms of potential for and intensity of harm to self and/or others) and social acceptability of the targeted problematic behavior (Carter & Wheeler, 2005). In other words, a highly intrusive intervention for an individual with comparatively low levels of severity of problematic behavior might be the least intrusive intervention for an individual with comparatively high levels of severity of problematic behavior.

However, not all treatment intrusiveness is produced by what professionals intend to do in terms of contrived treatment components and overt program design. Based on philosophies and practices within extant research, Carter et al. (2011) contributed to the construct of treatment intrusiveness by defining it as “the degree to which an intervention cre-

ates unwanted associations such as negative labels or consequences resulting in restrictions on activities or the potential for side effects” (p. 151). The implication here is that initial intent and the implementation of that intent within complex environments (and the associated outcomes for stakeholders) are not always synonymous. For example, Mayton (2005) examined the school-based quality of life of a young female student with Asperger syndrome and found that planned Individualized Education Program (IEP) provisions intended to assist the student sometimes produced negative outcomes for her when implemented. Unwanted outcomes included isolation from other students and additional school work that had to be taken home and completed. Across all students with disabilities, problems such as low levels of treatment integrity, poorly constructed and implemented methods of program evaluation, and inadequate training across faculty and staff can contribute to the fact that good intent and program design are not enough to avoid unwanted effects in actual practice.

#### **Challenges within School-Based Treatments for Students with Autism**

School-based treatments for students with autism have reportedly been faced with a number of significant challenges. Wilczynski, Menousek, Hunter, and Mudgal (2007) noted that there was limited research to guide the development of IEPs for children with autism, and thus educators had to rely on clinical judgments when developing these programs. Similarly, Ruble, McGrew, Dalrymple, and Jung (2010) found that IEPs developed for children with autism often did not follow best practices and frequently lacked components to address key needs such as communication and social skills. They recommended the use of evaluation tools as a method for developing high quality educational programs. In addition to the concerns raised regarding program design deficiencies is the fact that educators tend to rely on group consensus to evaluate the intrusiveness of behavioral treatments included within IEPs (Scott, et al., 2005; Snell, Voorhees, & Chen, 2005), which can lead to a great deal of variation in the procedures considered appropriate, especially for students

presenting relatively unique and often severe behavioral traits. Further, students diagnosed with autism who also exhibit problematic behavior are at high risk for exclusion from typical education programs, not only due to engaging in more severe behaviors such as tantrums and aggression (Strain, Wilson, & Dunlap, 2011), but also due to engaging in much less severe behaviors that are a common manifestation of the diagnosis, such as insistence on sameness and stereotypy (Neitzel, 2010). It is very probable that the combination of (a) limited external guidance in IEP development, (b) lack of necessary treatment components, (c) over-reliance on group consensus, and (d) the tendency to exclude these students from typical aspects of the educational environment can create a situation that is highly conducive to the formation and implementation of overly intrusive behavioral and educational treatments for these students.

### **Investigating Educational Planning and Intrusiveness**

In attempting to influence a more guided, systematic analysis of school-based treatment intrusiveness, Carter et al. (2011) developed an instrument that provides a method for evaluating the degree to which behavioral support plan procedures may (a) include negative consequences, (b) place restrictions on the environments that students access, and (c) place unwanted stigmatization on students. Using both pre-service and currently employed education professionals as participants, Carter et al. determined that the School Treatment Intrusiveness Checklist (STIC) was capable of discriminating among several types of treatment options within a series of case vignettes that represented school-based behavioral treatments across a range of intrusiveness. Among the authors' implications of incorporating the STIC into the design and implementation of educational treatments for problematic behavior were: (a) provision of a more structured approach to considering undesired side effects within the design of such treatment programs (side effects that often run counter to the stated, ameliorative goals within these programs), and (b) the ability for school personnel to adjust current treatments that may be unnecessarily intrusive for stu-

dents, thus increasing the quality and potential efficacy of their educational experience.

The current study was designed to take an initial step toward investigating the intrusiveness of school-based behavioral treatments through administration of the STIC with students with disabilities attending public schools, with a specific focus on students with autism. As no previous study has approached this topic, the current investigation focused on a series of basic research questions: Does the overall level of treatment intrusiveness within school-based, behavioral treatments for students with autism and intellectual disability differ significantly from that of students in other disability categories? Does treatment intrusiveness across various educational components for students with autism and intellectual disability differ significantly from that of students in other disability categories? Are any significant relationships present in the treatment intrusiveness of educational components across students in IDEA disability categories?

### **Method**

#### *Participants*

Within their field placements in an online graduate course in behavior assessment, support, and intervention, 114 special education graduate students were given the assignment to read the Carter et al. (2011) article and use the STIC to gather relevant, anonymous information regarding two of the children or young adults in their care. Participants had field placements that ranged across 13 states and over 100 public schools, though the majority of their placements were in the state of West Virginia, the base of operations for the online graduate course. Table 1 presents the proportion of graduate student field placements and K-12 students by disability category.

#### *Sampling*

Graduate student participants were instructed to complete the STIC for two K-12 students with the following general characteristics: (a) of school age (5 to 21 years old), (b) attending a public school, and (c) receiving school-based disability services under IDEA 2004. Par-

**TABLE 1**

**Proportion of Graduate Student Field Placements, and K-12 Students by Disability Category**

<i>State</i>	<i>% of Field Placements</i>	<i>% Autism</i>	<i>% E/BD</i>	<i>% ID</i>	<i>% LD</i>	<i>% Multiple</i>	<i>% OHI</i>
West Virginia	67%	52%	75%	81.3%	85%	55%	85%
Ohio	7%	7%	9%	6.2%	3.75%	16%	–
Pennsylvania	5%	11%	6%	–	–	6%	5%
Kentucky	4%	5%	2%	–	3.75%	11%	–
Maryland	3%	3%	4%	–	–	6%	–
Texas	3%	5%	–	–	–	–	–
Virginia	3%	3%	2%	–	3.75%	–	5%
Wisconsin	3%	7%	–	6.2%	–	–	–
Georgia	1%	–	–	–	–	6%	–
Mississippi	1%	2%	–	–	–	–	–
North Carolina	1%	3%	–	6.2%	–	–	5%
New Jersey	1%	2%	2%	–	–	–	–
South Carolina	1%	–	–	–	3.75%	–	–

ticipants were also instructed that the public school students chosen for the completion of the assignment must have behavioral goals and a behavior support plan (BSP) within their IEPs. Participants were not provided with any instructions or requirements regarding the types of students (e.g., male or female) or disability categories they were to select for completion of the assignment, though they were instructed to maintain confidentiality by (a) choosing only students within their own field placement classrooms, (b) attaching no identifying personal data regarding the students, and (c) speaking only with stakeholders directly involved with the student on a daily basis (e.g., their supervising classroom teachers) in order to get needed information for completing the STIC.

*Instrumentation*

The STIC has the following characteristics:

- 43 items within 8 sections (*Best Practice Intervention Development; Setting; Interactions; Curriculum; Organization of the School Day; Access to Materials, Facilities, and Resources; Transportation; Related Services*)
- Produces section and cumulative raw scores, as well as cumulative percentages (presence of intrusive treatments % + absence of intrusive treatments % = 100%)

- Applies score range modifiers for both *mild/moderate* and *severe/profound* levels of disability, challenging behavior, academic difficulty, and/or social needs to indicate an intrusiveness descriptor from the following semantic gradient: *low, moderate, moderately high, high, excessively high*

It should be noted that the STIC controls for severity by allowing more treatment intrusiveness for more severe levels of disability in the designation of intrusiveness descriptors. The main assumption here is that more severe levels of disability require more intensive levels of specialized services that can legitimately require more restrictive program features, such as alternate educational placement.

*Data Analysis*

Within this initial investigation into the heretofore unknown, potential presence and topography of the intrusiveness of behavioral treatments for students with autism, the scope and focus of all research questions lead to the use of basic, quantitative analysis methodologies. Research question 1 was answered by using the Kruskal-Wallis one-way analysis of variance test (Fraenkel, Wallen, & Hyun, 2012) to compare total treatment intrusiveness scores across all disability categories. Since the sampling method did not allow for

the data to meet required assumptions for the use of a parametric test of significance (e.g., an analysis of variance, or ANOVA), the Kruskal-Wallis was used to compare the scores from more than two independent groups. Research question 2 was answered by using the Kruskal-Wallis test to compare STIC section scores across all disability categories, and research question 3 was answered by calculating (Pearson  $r$ ) correlations among all section scores. If significance was detected using the Kruskal-Wallis, post hoc analysis of groupings was conducted according to Conover (1999).

### Exclusion Criteria

STIC protocols were excluded from the study if any of the requested information was missing or incomplete. A primary disability category was excluded from the study if fewer than 10 acceptable protocols were received in regard to students within that category. Using these criteria, 13% ( $n = 30$ ) of the collected protocols were rejected due to missing or incomplete information, and three primary disability categories represented within acceptable protocols were not included within the current study (*sensory impairment*: 6 protocols; *speech-language impairment*: 1 protocol; *traumatic brain injury*: 1 protocol).

## Results

### Demographics

Acceptable STIC data represented 198 individual students with disabilities, with autism and emotional/behavioral disturbance (E/BD) representing the two largest proportions across the IDEA disability categories within the sample (32.8% and 26.8%, respectively). Other disability categories represented within acceptable protocols were (a) intellectual disability (ID), (b) learning disability (LD), (c) multiple disabilities (multiple), and (d) other health impaired (OHI). (Table 2 presents the proportion of public school students by disability category.) It was reported that 25% of these students had also been identified under a secondary disability category. Ages ranged from 5 to 20 years (mean = 11.4, median = 11, standard deviation = 3.4), and the D'Agostino-Pearson test for normal distri-

TABLE 2

Proportion of Public School Students by Disability Category

Primary Disability Category	Number of Students in Sample	Proportion of Total
Autism	65	32.8%
E/BD	53	26.8%
LD	26	13.1%
OHI	20	10.1%
Multiple	18	9.1%
ID	16	8.1%

bution (Sheskin, 2004) indicated that ages within the sample were normally distributed ( $P = 0.16$ ). All severity levels of disability (mild, moderate, severe, profound) were represented within the sample, though in varying proportions among disability categories. Figure 1 displays the percentage of students within each severity designation across disability categories.

### Raw Scores

Raw intrusiveness scores from the STIC protocols were collected and examined by disability category. Score ranges for students with ID, LD, multiple, and OHI were all similar, with an overall range of 0 to 15 (with a potential

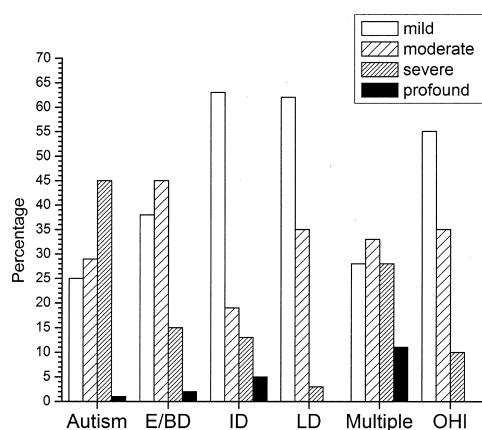
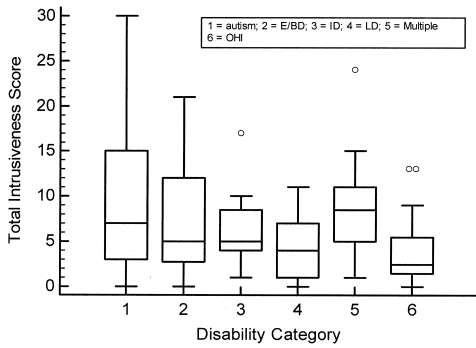


Figure 1. Percentage of students within each disability severity designation, by disability category.



**Figure 2.** Box-and-whisker plot of raw intrusiveness scores by disability category. Note that circles above each column represent outliers; the portions above and below the values at the top and bottom of the boxes represent the proportion of scores in the upper and lower quartiles (25% of the data are higher/lower than the upper/lower values of the box); and the horizontal lines within the boxes represent the median value of each dataset.

maximum of 43). Students with autism had the largest score range, followed by students with E/BD. Students within these two disability categories also had the largest number of scores in the upper quartile, though this phenomena was more pronounced for students with autism. Figure 2 presents a box-and-whisker plot of raw intrusiveness scores by disability category.

*Pearson r Correlations*

Pearson *r* correlations were calculated across all section scores from all STIC protocols. No significant negative correlations were found among section scores. However, several positive correlations of sufficient strength (a correlation coefficient of at least 0.50) were discovered. The strongest positive correlation was found between scores from Section 5, *Organization of the School Day*, and Section 6, *Access to Materials, Facilities, and Resources* ( $r = 0.75$ ;  $P = <0.0001$ ). Also of note were positive correlations among scores from the following sections: (a) *Setting*, with *Interactions* ( $r = 0.54$ ;  $P = <0.0001$ ), *Curriculum* ( $r = 0.55$ ;  $P = <0.0001$ ), and *Organization of the School Day* ( $r = 0.58$ ;  $P = <0.0001$ ); and (b) *Interactions*,

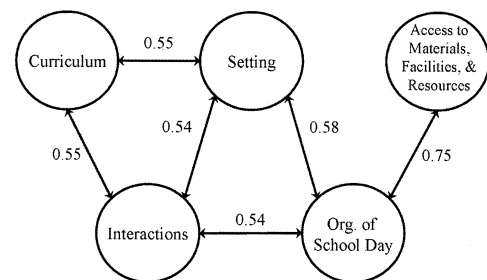
with *Curriculum* ( $r = 0.55$ ;  $P = <0.0001$ ) and *Organization of the School Day* ( $r = 0.54$ ;  $P = <0.0001$ ). See Figure 3 for a graphic representation of these relationships.

*Significance by Cumulative Intrusiveness Scores*

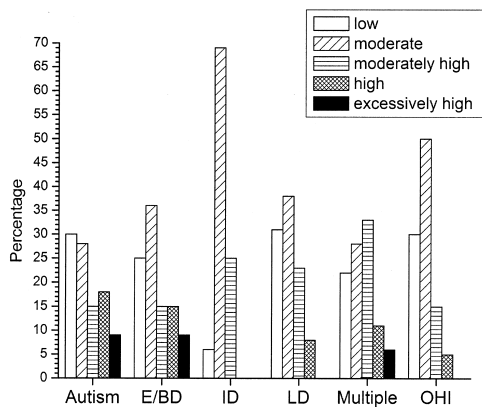
STIC cumulative intrusiveness scores were statistically compared by disability category using the Kruskal-Wallis test. Scores of students with ID and autism were highlighted for the sake of comparison and contrast within the current study. ID cumulative scores were not significantly different from scores in any other disability category, but cumulative scores for students with autism were found to be significantly higher than those of students with LD and OHI (for all calculations,  $N = 198$ ;  $df = 5$ ;  $P = 0.0028$ ). The only other disability categories with total intrusiveness scores that were significantly different were those of students with (a) E/BD (significantly higher than scores of students with OHI, but not significantly higher than those of students with autism), and (b) multiple (significantly higher than scores of students with LD, but multiple scores ranked lower than autism scores).

*Significance by Descriptors*

As described previously, the STIC produces a descriptor to indicate the relative level of intrusiveness within a school-based treatment. Even though the reported disability severity levels of students with autism were found to be significantly higher than those of students with E/BD, ID, LD, and OHI (Kruskal-Wallis;  $df = 5$ ;  $P = 0.0001$ ), no significant difference among the five STIC descriptors was found



**Figure 3.** Positive correlations among section scores of the STIC.



**Figure 4.** STIC treatment intrusiveness descriptors: Percentage of students by disability category.

when cases were grouped by disability category (Kruskal-Wallis;  $df = 5$ ;  $P = 0.56$ ). Figure 4 provides a summary of the descriptors.

*Significance by Section Score*

STIC intrusiveness scores from each section of the instrument were statistically compared by disability category using the Kruskal-Wallis test. The intrusiveness levels within *Best Practice Intervention Development* were significantly

lower for students with autism than for students with LD and multiple. However, intrusiveness levels for *Setting*, *Interactions*, *Curriculum*, *Organization of the School Day*, *Access to Materials*, and *Transportation* for students with autism were significantly higher as compared with those of students identified within 1 to 4 of the 5 other categories (for all calculations,  $N = 198$ ;  $df = 5$ ;  $P = 0.003$ ). Once again for the sake of comparison, scores for students with autism are contrasted with those of students with ID. Table 3 presents the Kruskal-Wallis results by section of the STIC.

**Discussion**

Students with autism were found to have (a) the highest intrusiveness raw score range, (b) the highest proportion of intrusiveness scores in the upper quartile (both higher than even students with E/BD) and (c) cumulative intrusiveness scores higher in terms of statistical significance than those of students with LD and OHI. In addition to these facts is that reported disability severity levels for students with autism were significantly higher than those of students in four out of the five other disability categories represented in the sample. On the surface, higher levels of intrusiveness may seem an expected finding because of

**TABLE 3**  
**Kruskal-Wallis Results by Section of the STIC**

<i>STIC Section</i>	<i>Intrusiveness Scores for Students with Autism</i>	<i>Intrusiveness Scores for Students with ID</i>
1. Best practice intervention development	✓significantly <u>lower</u> than LD & multiple	✓no significant differences
2. Setting	✓significantly <u>higher</u> than LD & OHI	✓no significant differences
3. Interactions	✓significantly <u>higher</u> than E/BD, LD, & OHI	✓no significant differences
4. Curriculum	✓significantly <u>higher</u> than OHI	✓no significant differences
5. Organization of the school day	✓significantly <u>higher</u> than E/BD, ID, LD, & OHI	✓significantly <u>lower</u> than autism
6. Access to facilities, materials, & resources	✓significantly <u>higher</u> than E/BD, LD, & OHI	✓no significant differences
7. Transportation	✓significantly <u>higher</u> than E/BD & LD	✓no significant differences
8. Related services	✓no significant differences	✓no significant differences

*Note.* For all calculations,  $N = 198$ ,  $df = 5$ ,  $P = 0.003$ .

the reported predictive relationship between more severe levels of autism and the presence of problematic behavior (Matson, Wilkins, & Macken, 2009; Jang, Dixon, Tarbox, & Granpeesheh, 2011), thus necessitating higher levels of intrusiveness within the behavioral programs of these students. However, this deduction does not take into account the *topography* of the problematic behavior, an area that reflects one of the limitations of the current study. Both Matson et al. and Jang et al. ( $N = 84$  and  $N = 313$  children with autism, respectively) found that repetitive behavior was the most frequently endorsed problematic behavior within the children in their samples, and Matson found that these behaviors were also the most likely to be labeled as “severe” in terms of their intensity. In comparison with more potentially dangerous, destructive and harmful behaviors such as physical aggression, it is highly questionable as to whether behaviors such as stereotypy should necessitate more intrusive levels of behavioral and educational treatment.

Even though students with autism were found to have the highest cumulative intrusiveness scores, no statistical significance was found in the five STIC descriptors across students in all disability categories. This was an expected finding, due to the fact that the STIC allows more intrusiveness within the assignment of descriptors for students with more severe levels of disability. For example, a student with a severe level of disability might receive the descriptor “low” for the same level of intrusiveness that may produce a “high” for a student with a mild disability. However, it was not expected that three out of six disability categories would have scores described as “excessively high,” with autism and E/BD tied for the top position. In addition, autism had the most “high” ratings across all categories. This indicates that a segment of students with autism are receiving behavioral treatments that are much more intrusive than warranted, even after taking severity of symptoms into account.

Correlations across scores for all students suggest that a decision to include one intrusive plan component is likely to be associated with the use of a similarly high level of intrusiveness in other programmatic areas. Conversely, it can be postulated that the removal

of unwarranted intrusiveness in one or more areas could have a pervasive, positive effect on other areas of a student’s school life. Findings also suggest that changes in the intrusiveness within the area of setting seem to be connected to changes in intrusiveness regarding how a student’s school day is organized and his/her level of access to the typical materials, facilities, and resources enjoyed by most students. This suggests that the place in which students with disabilities are educated within schools is also connected with how like or different their experience is in terms of, for instance, access to activities like cooperative learning or attending pep rallies or assemblies (as mentioned within the STIC protocol), as compared with typical students. Also of particular interest are the positive relationships among levels of intrusiveness in the areas of setting, social interactions, and curriculum. One could reasonably propose that changes in setting would tend to be directly associated with changes in social interactions, but, considering the portability of curriculum, it is unclear why this aspect of a student’s school experience would also change accordingly. These findings, however, are consistent with those of a small-sample study that offers one plausible suggestion for the presence of these relationships. Kurth and Mastergeorge (2010) found marked differences in the education programs of adolescents with autism, as determined by educational setting. Even though all students’ IEP goals were based on the same set of curricular standards, students in noninclusive settings focused more on functional and rote skills, while students in inclusive settings focused more on higher-order academic skills. Though these findings need to be replicated in a larger study, they do suggest a salient avenue of investigation for the relationship between intrusiveness in curriculum and educational setting.

One of the most intriguing of all the findings in the current study came from the statistical comparison among section scores of the STIC. The level of intrusiveness within *Best Practice Intervention Development* (e.g., the student’s treatment package was based upon the results of a functional analysis or functional behavior assessment) was significantly lower for students with autism than for students in two (LD & multiple) out of the five remaining



categories. However, intrusiveness levels for *Setting, Interactions, Curriculum, Organization of the School Day, Access to Materials, and Transportation* for students with autism were significantly higher as compared with those of students identified within one to four of the five other categories. This suggests that although behavior intervention *planning* is considered to be more rigorously and consistently conducted for students with autism than for other groups of students with disabilities, the *implementation* of their behavioral programs is less able to approximate the lower levels of intrusiveness present in the programs of students in other disability categories. This planning/implementation discrepancy is consistent with the findings of research regarding the research-to-practice gap and lack of treatment integrity in the education and treatment of children with autism (Lerman, Vorndran, Addison, & Kuhn, 2004; DiGennaro, Martens, & McIntyre, 2005; Dingfelder & Mandell, 2011), as is the reported tendency toward excluding these students from typical education programs (Neitzel, 2010; Strain et al., 2011).

One last check on the fit of the intrusiveness model with the findings of extant research was the descriptive and statistical comparison of results for students with autism to those of students with ID. Students with ID presented almost a mirror image of students with autism in terms of the intrusiveness of their behavioral programs, even though every student with a disability included in the current analysis engaged in problematic behaviors that were addressed within a formalized behavior intervention plan. Matson and Rivet (2008) found that as autistic symptoms increased in persons with ID, so did the frequency of their challenging behavior. Similarly, Rojahn, Wilkins, Matson, and Boisjoli (2010) found that, even though adults with ID displayed the same types of problematic behaviors as adults with autism, adults with autism tended to engage in these behaviors with significantly greater frequency and intensity. Beginning with the premise that treatment intrusiveness tends to increase as the severity of symptoms increase, the comparative findings within the current study seem to be supported by the documented differences in the intensity of problematic behavior between individuals in the two groups.

### *Limitations*

The current study had several limitations that should be noted. Since random sampling was not used in this initial investigation, participants may have been sensitized to purposefully choose students with the highest rates and/or intensities of challenging behavior, and this could have skewed the composition of the sample. However, this in itself would not adversely affect the intrusiveness scores for these students. Although supervising teachers and the course instructor worked with participants in the process of gathering and recording accurate data for the STIC, the addition of a measure of interrater reliability would better ensure the integrity of intrusiveness data. In addition, sample sizes across disability categories were relatively small, gathered mostly from a single state, and comprised of a higher proportion of students with autism. This may have affected results in a way that is less typical of the larger population of students within disability categories.

### *Directions for Future Research*

In the short term, future research in this area should focus on seeking larger, random, stratified samples of students across all IDEA disability categories. It would also be useful to include (a) additional demographic characteristics of students (e.g., educational placement and challenging behaviors) and behavior program characteristics as grouping variables for the examination of results, (b) qualitative measures that can indicate stakeholder perceptions related to the balance of intrusiveness and treatment efficacy and appropriateness, and (c) an examination of how STIC results may correlate with other measures such as social validity, self-determination, and quality of life. In the long term, future research should perhaps focus on refining and even expanding the intrusiveness construct, as well as investigating differences in how school-based support teams plan behavioral interventions both with and without a structured process for evaluating the intrusiveness of the treatments they propose.

## References

- Carter, S. L., Mayton, M. R., & Wheeler, J. J. (2009). The development of an instrument to evaluate treatment intrusiveness for individuals with severe and challenging behavior. *Research in Developmental Disabilities, 30*, 58–69.
- Carter, S. L., Mayton, M. R., & Wheeler, J. J. (2011). A teacher's checklist for evaluating treatment intrusiveness. *Alberta Journal of Educational Research, 57*, 150–169.
- Carter, S. L., & Wheeler, J. J. (2005). Considering the intrusiveness of interventions. *The International Journal of Special Education, 20*, 136–142.
- Conover, W. J. (1999). *Practical nonparametric statistics* (3rd ed.). New York: John Wiley & Sons.
- DiGennaro, F. D., Martens, B. K., McIntyre, L. L. (2005). Increasing treatment integrity through negative reinforcement: Effects on teacher and student behavior. *School Psychology Review, 34*, 220–231.
- Dingfelder, H. E., & Mandell, D. S. (2011). Bridging the research-to-practice gap in autism intervention: An application of diffusion of innovation theory. *Journal of Autism and Developmental Disorders, 41*, 597–609.
- Etscheidt, S. K. (2006). Progress monitoring: Legal issues and recommendations for IEP teams. *Teaching Exceptional Children, 38*, 56–60.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York: McGraw-Hill.
- Fox, R. M., & Meindl, J. (2007). The long term successful treatment of the aggressive/destructive behaviors of a preadolescent with autism. *Behavioral Interventions, 22*, 83–97.
- Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).
- Jang, J., Dixon, D. R., Tarbox, J., & Granpeesheh, D. (2011). Symptom severity and challenging behavior in children with ASD. *Research in Autism Spectrum Disorders, 5*, 1028–1032.
- Kurth, J., & Mastergeorge, A. M. (2010). Individual education plan goals and services for adolescents with autism: Impact of age and educational setting. *The Journal of Special Education, 44*, 146–160.
- Lerman, D. C., Vorndran, C. M., Addison, L., & Kuhn, S. (2004). Preparing teachers in evidence-based practices for young children with autism. *School Psychology Review, 33*, 510–526.
- Matson, J. L., & Rivet, T. T. (2008). Characteristics of challenging behaviours in adults with autistic disorder, PDD-NOS, and intellectual disability. *Journal of Intellectual & Developmental Disability, 33*, 323–329.
- Matson, J. L., Wilkins, J., & Macken, J. (2009). The relationship of challenging behaviors to severity and symptoms of autism spectrum disorders. *Journal of Mental Health Research in Intellectual Disabilities, 2*, 29–44.
- Mayton, M. R. (2005). The quality of life of a child with Asperger's disorder in a general education setting: A pilot case study. *The International Journal of Special Education, 20*, 85–101.
- Neitzel, J. (2010). Positive behavior supports for children and youth with autism spectrum disorders. *Preventing School Failure, 54*, 247–255.
- Rojahn, J., Wilkins, J., Matson, J. L., & Boisjoli, J. (2010). A comparison of adults with intellectual disabilities with and without ASD on parallel measures of challenging behaviour: The Behavior Problems Inventory-01 (BPI-01) and Autism Spectrum Disorders-Behavior Problems for Intellectually Disabled Adults (ASD-BPA). *Journal of Applied Research in Intellectual Disabilities, 23*, 179–185.
- Ruble, L. A., McGrew, J., Dalrymple, N., & Jung, L. A. (2010). Examining the quality of IEPs for young children with autism. *Journal of Autism and Developmental Disorders, 40*, 1459–1470.
- Scott, T. M., McIntyre, J., Liaupsin, C., Nelson, C. M., Conroy, M., & Payne, L. D. (2005). An examination of the relation between functional behavior assessment and selected intervention strategies with school-based teams. *Journal of Positive Behavior Interventions, 7*, 205–215.
- Sheskin, D. J. (2004). *Handbook of parametric and nonparametric statistical procedures* (3rd ed.). Boca Raton: Chapman & Hall /CRC.
- Snell, M. E., Voorhees, M. D., & Chen, L. (2005). Team involvement in assessment-based interventions with problem behavior: 1997–2002. *Journal of Positive Behavior Interventions, 7*, 140–152.
- Strain, P. S., Wilson, K., & Dunlap, G. (2011). Prevent-teach-reinforce: Addressing problem behaviors of students with autism in general education classrooms. *Behavioral Disorders, 36*, 160–171.
- Wachtel, L. E., Jaffe, R., & Kellner, C. H. (2011). Electroconvulsive therapy for psychotropicrefractory bipolar affective disorder and severe self-injury and aggression in an 11-year-old autistic boy. *European Child and Adolescent Psychiatry, 20*, 147–152.
- Wilczynski, S. M., Menousek, K., Hunter, M., & Mudgal, D. (2007). Individualized education programs for youth with autism spectrum disorders. *Psychology in the Schools, 44*, 653–666.

---

Received: 10 May 2012

Initial Acceptance: 12 July 2012

Final Acceptance: 10 December 2012