

Effects of Weighted Vests on the Engagement of Children With Developmental Delays and Autism

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Abstract

The use of weighted vests for children with autism spectrum disorders and developmental disabilities is a common practice as part of sensory integration therapy programs. The purpose of the current investigation was to extend the research on the use of weighted vests for children with autism and developmental delays in a methodologically rigorous study. The study was conducted using an alternating treatment design. This allowed the comparison of three different conditions: weighted vest, vest with no weight (which served as a placebo), and no vest (which served as a baseline). The results showed no differentiation in engagement between conditions for any of the participants. Implications for practice and future research are provided.

Keywords

autism spectrum disorders, sensory integration, weighted vests, engagement

Sensory abnormalities are frequently reported by individuals with autism spectrum disorders (ASD) and parents of individuals with ASD (Rogers, Hepburn, & Wehner, 2003). Although sensory abnormalities are not a diagnostic marker for ASD, these abnormalities may be one of the first signs of the disorders (Lord & McGee, 2001). Reports of sensory abnormalities suggest that individuals with ASD display atypical sensory responses due to poor sensory integration (SI) or arousal modulation (Baranek, 2002). Although reports of sensory abnormalities in ASD are numerous, no empirical evidence exists that explains the underlying neurological processes responsible for such abnormalities (Rogers & Ozonoff, 2005). In fact, recent data have been interpreted to suggest that the pattern of sensory abnormalities might differ across diagnostic categories of ASD (Myles et al., 2004). Hence, much remains to be discovered concerning how individuals with ASD process sensory information.

The hypothesized differences in processing sensory information for individuals with ASD have led to the creation of several treatments and practices based on the theories underlying SI therapy (Ayres, 1972; Iarocci & McDonald, 2006; Schaaf & Miller, 2005; Smith, Mruzek, & Mozingo, 2005). The use of a weighted vest has been hypothesized to decrease behavioral difficulties by helping children regulate and organize sensory input (Olson & Moulton, 2004) and has become a common treatment for children with ASD (Green et al., 2006). Although weighted vests frequently are used with children with ASD, there are no protocols or guidelines for

practice (Fertel-Daly, Bedell, & Hinojosa, 2001; VandenBerg, 2001). Olson and Moulton (2004) surveyed occupational therapists (OTs) and found that they reported having insufficient knowledge and information about how to use weighted vests. OTs must make difficult decisions regarding the weight of the vest as well as when, how long, and how often a child should wear the vest (Farber, 1982). The lack of a protocol and guidelines for practice with weighted vests might increase the possibility of improper or unnecessary use. Furthermore, wearing weighted vests may have an aversive rather than a therapeutic effect (e.g., Kane, Luiselli, Dearborn, & Young, 2004/2005).

In a database search of PsycINFO and Medline, four articles examining the use of weighted vests were identified: three with children with ASD (Case-Smith & Bryan, 1999; Fertel-Daly et al., 2001; Kane et al., 2004/2005) and one with children with attention difficulties (VandenBerg, 2001). Case-Smith and Bryan (1999) examined the use of direct

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occupational therapy including weighted vests in five children with ASD. In their study, an OT engaged in 30-min SI sessions incorporating vestibular (e.g., swings for linear movement), tactile (e.g., sand and water tables), and proprioceptive stimulation (e.g., brushes and weighted vests) activities with each participant. The results showed increased levels of play, more adult and peer interactions, and decreased levels of nonengagement. Interpretation of these results is difficult for two reasons. First, the researchers did not demonstrate experimental control due to the use of an A-B design (i.e., there were no return-to-baseline conditions to measure target behaviors in a second no-vest condition). Second, the independent variable (i.e., duration and frequency of the use of weighted vests, swings, or brushes) is not defined in a replicable manner, and the weighted vest use was integrated with other SI therapies, thus precluding the analysis of the effects of only the weighted vests.

Fertel-Daly et al. (2001) examined the use of weighted vests in five children with pervasive developmental disorders. In their study, four 0.25-lb weights were evenly distributed in pouches on the front and back of the vest. The children wore the vests for the first 2 hr of the school day. All participants demonstrated increased focused attention while wearing the weighted vests; however, these results are difficult to interpret. The dependent variables did not return to baseline levels when the intervention was removed, suggesting threats to internal validity (i.e., history and/or maturation). The failure to retrieve initial baseline levels fully can be remedied when using the A-B-C design by changing conditions only after establishing a stable or contratherapeutic trend (Tawney & Gast, 1984). Because the researchers did not establish a stable or contratherapeutic trend, experimental control was not demonstrated.

The third examination of the use of weighted vests was conducted by Kane et al. (2004/2005) and included three participants with autism and one participant with pervasive developmental disorders—not otherwise specified (PDD-NOS). These researchers included three sequential conditions: no vest, vest with no weight, and weighted vest. Five percent of the child's weight was added to the vest in the weighted-vest condition. The researchers concluded that the use of a weighted vest was an ineffective intervention for increasing attention and decreasing stereotypic behavior. However, the results are difficult to interpret. The researchers used a sequential introduction of the conditions (e.g., A-B-C), which, without a return to baseline or a vest no weight condition, does not establish experimental control.

VandenBerg (2001) examined the relation between wearing a weighted vest and time on task for four children with attention-deficit/hyperactivity disorder. Children wore weighted vests with 5% of their weight during a 15-min teacher-led, table-top activity (i.e., following verbal directions for drawing, pasting, coloring, and cutting). Examination

of the results suggests that the weighted vest was an effective intervention for increasing time on task during typical table-top activities. Again, these results are difficult to interpret due to methodological limitations. Similar to the study by Case-Smith and Bryan (1999), an A-B design, which fails to demonstrate experimental control, was used. Furthermore, the dependent variable (i.e., time on task) was not operationalized, which precludes independent replication of the study. Finally, the participant descriptions did not include functional abilities or typical behavior patterns, further limiting the generality of the findings.

The methodological limitations of these studies make interpretation of the results speculative. Each of the studies had weak internal validity, did not report procedural or treatment fidelity, and did not report or had poor interobserver agreement (IOA). Hence, there are no rigorous findings on the effects of using weighed vests for children with ASD and no evidence for continued use of the practice. However, the use of weighted vests is likely to continue, although protocol and evidence of efficacy is based solely on anecdotal reports (Joe, 1998). The present study was designed to extend the literature by examining the use of a weighted vest on the engagement of young children with developmental disabilities using a rigorous research methodology.

Method

Participants

Five inclusion criteria were used to select participants for this study: (a) educational or medical diagnosis of autism or developmental delay; (b) current use of a weighted vest during part of the school day; (c) 2 to 6 years old; (d) enrollment in a university-affiliated, inclusive early childhood center; and (e) teacher's judgment of benefit from the perceived advantages of a weighted vest (e.g., increased attention span or decreased challenging behaviors). Three participants were selected for this study.

Tommy was a 5-year-old male with a diagnosis of autism, who had been attending the center for 4 years. Tommy had worn a weighted vest for 2 years on an irregular schedule. Tommy received speech-language therapy and occupational therapy from the local school district. Tommy imitated one-word utterances and displayed limited functional communication behaviors. Many of Tommy's behaviors were stereotypic and rigid; Tommy frequently placed objects up to his eyes or lined up small cars or trains in a repetitive, preservative pattern. Tommy typically engaged in routines and activities for less time than his peers (e.g., Tommy engaged in circle time for 10 of the 25 min or table-top activities for 5 of the 10 min). Tommy displayed infrequent attempts at social interactions, often escaped small group activities, and avoided peer proximity. To assist Tommy

with classroom activities and transitions, an assistant (i.e., paraprofessional) was assigned specifically to Tommy. At the beginning of the study, the assistant had been working with him for 1.5 years.

Bert was a 4-year-old boy with developmental delays attributed to a neurological abnormality, who had been attending the center for 2.5 years. Bert had worn a weighted vest during part of the school day for 2 years. Although Bert was ambulatory, he displayed significant gross motor delays. Bert received speech-language therapy, physical therapy, and occupational therapy from the local school district. Bert needed one-to-one assistance with activities requiring fine motor control. Bert was nonverbal but often responded to social or communicative initiations with pointing or non-speech vocalizations. According to parent report, Bert experienced frequent seizures during sleep. To assist with classroom activities and transitions, an assistant was assigned specifically to Bert. When the study began, this assistant had been working with Bert for 6 months.

Sam was a 5-year-old boy with a diagnosis of autism and neurodevelopmental abnormalities. At the beginning of the study, he had been attending the center for 2 years. During group activities, Sam frequently exhibited lower levels of engagement in the activities than his peers and often needed redirection to remain engaged. Typical vocalizations from Sam were 2- to 3-word requests, which were often interlaced with echolalic and preservative vocalizations. To assist with classroom activities and transitions, an assistant was assigned specifically to Sam. At the start of the study, this assistant had been working with Sam for 9 months.

Setting

Each participant attended different classes within a university-affiliated early childhood center. Each class had a total of 12 children with and without disabilities and was staffed by one lead teacher and one assistant teacher. In addition to the two teachers in the classroom, each child's one-to-one assistant was present during all sessions. All sessions occurred during the daily morning table-time activity in the child's classroom. During the activity, children were seated at tables, and the teacher led the large group activities with verbal instructions while the assistant classroom teacher provided verbal and physical support to individual children. The activities included art projects (e.g., painting, coloring, gluing, cutting) or group instruction of typical preschool activities (e.g., matching, sorting). These activities were chosen because proponents of SI claim the therapy can increase attention, and the activities were such that the children were expected to maintain high levels of participation and attention. Data were collected during the first 10 min of each activity.

Materials

The materials used for this study were three weighted vests. Each vest had four pockets (two in the front and two in the back) and was provided by the child's OT (assigned by the local school district). With no weight, the vest weighed 17 g, which was less than 1% of each participant's body weight.

For the vest-with-weight condition, weight was added to the pockets of the vest until the total weight of the vest was equal to 5% of the child's weight (e.g., Joe, 1998; Kane et al., 2004/2005; VandenBerg, 2001). The weight was evenly distributed in the pockets front to back and left to right, according to the design of the vest. For the vest-with-no-weight condition, imposter weights were placed in the pockets of the vest. The imposter weights were cut from polyethylene pieces (e.g., foam) in the dimensions of the weights and weighed less than 3 g. The imposter weights were designed to make it unlikely for an observer to distinguish whether the participant was in the weighted-vest condition or the vest-with-no-weight condition. To test this distinction, 10 photographs were taken of the participant wearing the vest (5 photographs of the participant in the vest with weight and 5 photographs of the participant in the vest with no weight). Twenty-nine graduate students were asked to sort the photographs into two piles: vest with weight and vest with no weight. Given that the graduate students had a .50 probability of being correct, the mean proportion of correct identifications for the 10 pictures were compared to a benchmark of .5 using a binomial test. For 9 of 10 photographs, the graduate students had responses equivalent to chance. For 1 of 10 photographs, a greater proportion of the graduate students correctly identified the type of vest being worn. Thus, the results of the sorting indicate that the identity of the study condition was not apparent.

Experimental Design

An alternating treatments design (Barlow & Hayes, 1979) was used to evaluate the effects of wearing a weighted vest on the participants' engagement. Alternating treatment designs allow the comparison of multiple conditions, which were (a) weighted vest, (b) vest with no weight, and (c) no vest. The conditions were assigned randomly such that 5 consecutive school days (e.g., Tuesday through Monday) contained two sessions of the weighted-vest condition, two sessions of the unweighted-vest condition, and one session of the no-vest condition. One condition could not be in effect for three or more consecutive sessions (e.g., Thursday, Friday, and Monday). After beginning treatment with the first participant (i.e., Tommy), it was determined that a pre-treatment baseline phase of the no-vest condition would strengthen the design and was used with the remaining two participants (i.e., Bert and Sam).

One goal of the study was to design and implement the study such that it would be a double-blind placebo trial. The use of the unweighted-vest and no-vest conditions created the placebo contrasts in this study. The unweighted-vest condition also allowed the status of the vest condition (i.e., weighted or unweighted) to be unknown to the observers. However, it was not possible to determine if the participant knew the status of the vest condition, so it cannot be claimed that a double-blind placebo trial occurred. Randomized, double-blind placebo trials are typically conducted using a group research design, are considered the gold standard of group research designs (Campbell & Stanley, 1963; Shavelson & Towne, 2002), and allow the analysis of the effects of treatment while guarding against observer and participant bias. Because alternative treatments for individuals with autism often have strong biases and large placebo effects (Sandler, 2005), having the observer blind to the study condition was an important design feature of this study. The status of the condition of the individual sessions was revealed only after the data had been coded.

Procedure

Prior to the beginning of the study, each participant was weighed to establish the amount of weight to place in the pockets of the vest for the weighted-vest condition. The child's weight was multiplied by .05 (i.e., 5%) and rounded to the nearest ounce. This was the only instance that the participant was weighed during the experiment, and the amount of weight used in the vest remained constant throughout the study.

No vest condition. During the no-vest condition, participants did not wear a vest during the table-time activity; the only change in the environment was a graduate student (third and fourth authors) videotaping the activity. This condition provided an estimate of the typical behavioral pattern of each participant during the table-time activity. For Bert and Sam, an initial baseline condition was conducted using the no-vest condition. The initial baseline condition involved implementing the no-vest condition until stability was demonstrated in the data. Once stability was demonstrated, the comparison phase began.

Weighted vest condition. At the start of each session, a graduate student (second author) placed the weighted vest on the participant immediately before the table-time activity. Then, the third or fourth author, who was blind to the condition (i.e., was not present when the vest was placed on the child), videotaped the child participating in the table-time activity. When the table-time activity was finished, the graduate student videotaping the session exited the classroom and the graduate student who placed the vest on the child removed the vest from the participant; this was the only person aware of the condition (i.e., weighted vest

or vest with no weight). Other than the vest, the only other environmental manipulation was the presence of the graduate student videotaping the session.

Vest without weight condition. Sessions for the vest-without-weight condition (e.g., unweighted) were identical to the weighted-vest condition except imposter weights were placed in the pockets of the vest instead of the weights.

Dependent Measures

Five categories of behavior were coded: (a) engagement, (b) nonengagement, (c) stereotypic behavior, (d) problem behavior, and (e) unable to see child. *Engagement* was defined as purposeful manipulation of activity materials in the appropriate manner or attending to a teacher or peer (i.e., orientation of head and eyes to the teacher). *Nonengagement* included waiting because no activity was present, attending to something other than the materials of the activity, being out of the assigned seat, or engaging in any inappropriate behaviors except the individually predetermined problem or stereotypic behaviors. *Stereotypic behavior* was defined as interaction with the environment with an undifferentiated behavior (i.e., repetitive behaviors) or using simple low-level behaviors that interfere with appropriate engagement in the environment (e.g., mouthing the materials). Stereotypic behaviors were defined individually for each participant based on behavioral observation and teacher report. Stereotypic behaviors for Tommy included the manipulation of light by squinting eyes and arm flapping. Stereotypic behaviors for Bert included manipulation of light by flicking fingers or squinting eyes. Stereotypic behaviors for Sam included squinting eyes and flapping. *Problem behavior* was defined as any behavior interfering with other children's ability to participate in an activity and included crying, aggression, and tantrum behaviors (e.g., crying, hitting, kicking). The final dependent measure, *unable to see child*, included instances when coders were not able to see the participant's face at the recording interval. Two coding rules or hierarchies were established to ensure that only one category was recorded per interval. First, if the child was displaying stereotypic behavior, this was the behavior recorded. Second, if the child was demonstrating a problem behavior, this was the behavior recorded. Thus, the categories were mutually exclusive and exhaustive.

Data Collection

Equipment. Each session was videotaped using a Sony Handycam hard disk drive digital video camera. The videotaped sessions were downloaded to an external hard drive and analyzed by the third and fourth authors on a personal computer using Procoder DV (Tapp & Walden, 2000). Data were collected using a 10-s momentary time sample

recording system. Momentary time sampling was used because it provides the best estimate of duration (Powell, Martindale, Kulp, Martindale, & Bauman, 1977; Suen & Ary, 1989). Data from ProCoder DV was exported into Interval Manager (Tapp et al., 2006), which is a software program used to calculate the estimated duration of each behavior and IOA.

IOA. Data for calculating IOA were collected by the first author. IOA percentages were calculated using a point-by-point agreement formula: dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 (Tawney & Gast, 1984). Two booster coder training sessions were conducted due to IOA below 80%. During the booster session, the coders (first, third, and fourth authors) reviewed the code definitions and discussed examples and nonexamples of each behavior. After the booster session, the data containing the IOA below 80% were recoded by both observers (first author and third or fourth author) until IOA was greater than 80%. IOA data were calculated for 78.6% of the sessions for Tommy, 100% of the sessions for Bert, and 26.9% of the sessions for Sam. A lower percentage of sessions were calculated for Sam because he was the third participant and high rates of agreement had been established by the coders for the previous participants. The IOA percentages for Tommy were 94% across all conditions. The mean IOAs for Bert and Sam were 96% and 93%, with ranges across conditions of 95% to 96% and 90% to 94%, respectively. Across participants, mean IOA was greater than 90%, which is considered acceptable using conventional guidelines (e.g., Horner et al., 2005).

Results

Visual Analysis

Graphs of the dependent measures for each participant were analyzed visually. Visual analysis allows the determination of systematic differences between conditions within a participant, which might signal the presence of any functional relations. When analyzing alternating treatment design data, functional relations are demonstrated when systematic differences occur between conditions (Wolery, Gast, & Hammond, 2010).

Three graphs displaying the percentage of intervals coded as engaged, problem, and stereotypic behaviors were analyzed for Tommy (see Figure 1). Data can be interpreted to conclude that the weighted vest was not functionally related to engagement; the percentage of intervals coded as engaged had similar decreasing trends for all three conditions. Analysis of the data for problem behavior suggested the weighted vest was functionally related to increases in problem behavior; the percentage of intervals coded as problem behavior were greatest when Tommy was wearing the weighted vest.

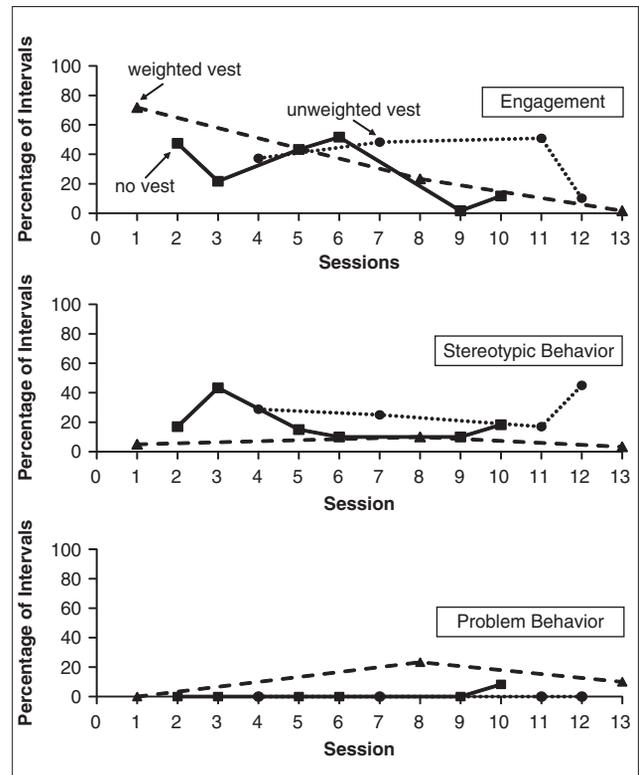


Figure 1. Percentage of intervals coded as engagement (top graph), stereotypic behavior (middle graph), and problem behavior (bottom graph) by condition for Tommy

There also appears to be a functional relation between stereotypic behavior and wearing the weighted vest; the percentage of intervals coded as stereotypic behavior was lowest when the weighted vest was being worn. Although the relations are clear, interpretations of this data must be made with caution due to the small number of sessions experienced in each condition. Although a greater number of sessions was desirable, the decreasing trend in the data did not provide any evidence of positive gain from the vest and suggested the possibility of negative outcomes (i.e., decreased engagement).

The percentage of intervals coded as engaged, problem, and stereotypic behaviors are shown for Bert in Figure 2 and Sam in Figure 3. There were no systematic differences in engagement, stereotypic behavior, or problem behavior for either participant between conditions. Thus, use of a weighted vest had no functional relation to changes in Bert's or Sam's behavior during this study. Stated differently, the level of engagement for Bert and Sam was not dependent on wearing a vest; they were just as likely to engage in the activity when wearing the weighted vest as they were when they wore the vest with no weights or did not wear a vest.

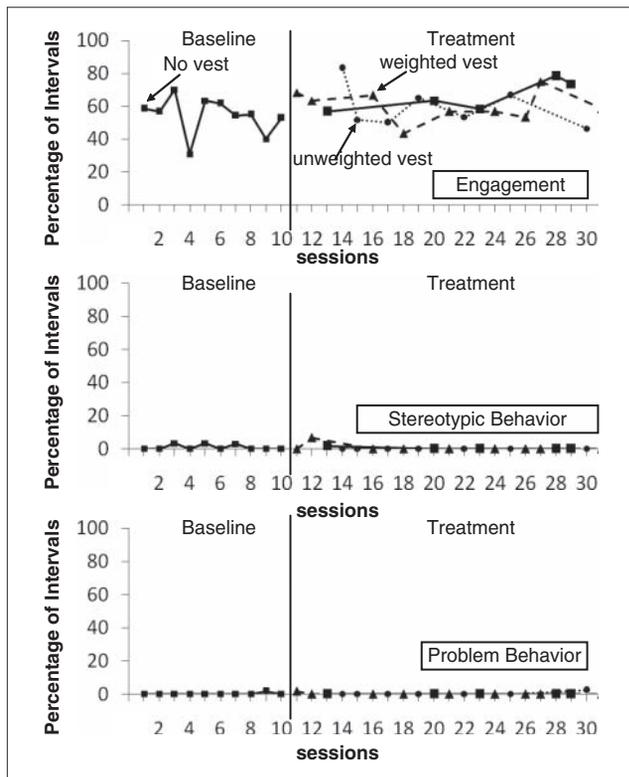


Figure 2. Percentage of intervals coded as engagement (top graph), stereotypic behavior (middle graph), and problem behavior (bottom graph) by condition for Bert

Social Validity

Social validity was assessed by 23 graduate students pursuing a master's degree in early childhood special education. The graduate students completed a questionnaire after viewing 14 video clips of 30-s duration filmed during the classroom activity. Six video clips were from the three conditions (no vest, weighted vest, unweighted vest) in effect for Tommy, and 8 video clips were from the three conditions (baseline/no vest, weighted vest, unweighted vest) in effect for Bert. No video clips of Sam were shown. The graduate students responded to two questions using a 7-point Likert scale: Was the child engaged in the activity, and did the child's stereotypic behaviors interfere with his ability to engage in the activity? Two questions about their impressions of weighted vests before seeing the video clips and after seeing the video clips were also included in the questionnaire. An analysis of variance (ANOVA) was conducted to examine differences by child and condition.

The results of the ANOVA for the social validity data are shown in Table 1. The assessment produced mixed results. The graduate students thought the weighted vest condition had a greater relation to low engagement for Bert. The graduate students perceived a decreased amount of stereotypic

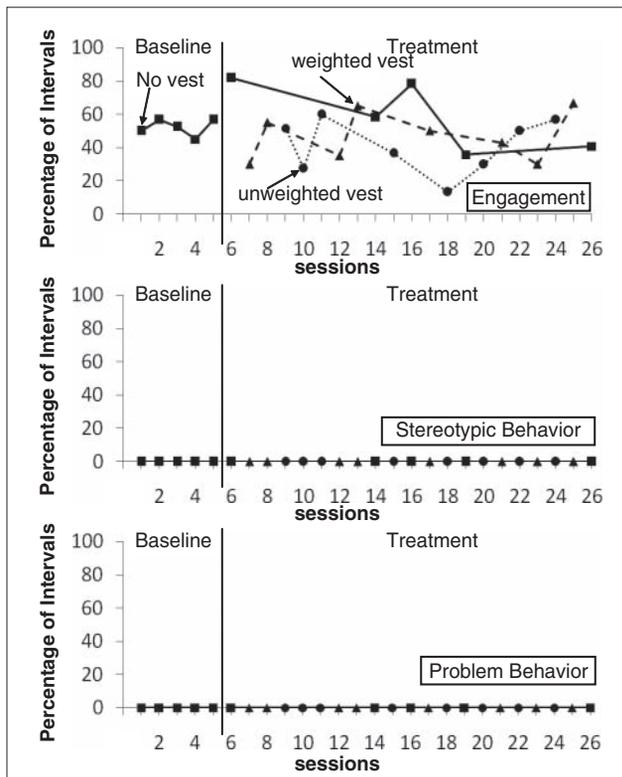


Figure 3. Percentage of intervals coded as engagement (top graph), stereotypic behavior (middle graph), and problem behavior (bottom graph) by condition for Sam

behavior for Tommy when he was wearing the weighted vest; however, they thought that Bert had higher levels of stereotypic behavior while wearing the weighted vest. The 23 preservice teachers did not rate weighted vests as an effective strategy for increasing engagement or reducing stereotypic behavior.

Discussion

The purpose of this experiment was to determine whether wearing a weighted vest would increase engagement during table-top activities for two children with autism and one child with developmental delays. This examination was warranted because previous studies contained serious methodological flaws, such as weak internal validity, lack of data on procedural or treatment fidelity, and poor or unreported IOA. The major finding of this study can be interpreted to conclude that weighted vests were not an effective intervention for increasing engagement for these participants in the context of a table-time activity in inclusive classrooms.

Previous findings on weighted vests have been variable. Some researchers have shown weighted vests to be ineffective (Kane et al., 2004/2005) whereas others suggest that

Table 1. Results of Social Validity Questionnaire for Tommy and Bert

Participant/ Condition	Mean Value of Engagement	Statistical Comparison With WV Condition ^a	Mean Value of Stereotypic Interference	Statistical Comparison With WV Condition ^a
Tommy NV	1.76	No difference ($p = .285$)	3.37	WV better ($p = .001$) ^b
Tommy WV	1.98	—	1.76	—
Tommy UV	1.96	No difference ($p = .940$)	3.37	WV better ($p = .001$) ^b
Bert NV	4.37	NV better ($p < .001$) ^b	1.71	NV better ($p < .001$) ^b
Bert WV	2.65	—	3.17	—
Bert UV	3.70	UV better ($p = .004$) ^b	1.93	UV better ($p < .001$) ^b

WV = weighted vest; NV = no vest; UV = unweighted vest

^aThere were no statistically significant differences between the no-vest and unweighted-vest conditions

^bStatistically significant

weighted vests might be an effective intervention (Case-Smith & Bryan, 1999; Fertel-Daly et al., 2001; VandenBerg, 2001). However, drawing conclusions from these studies is difficult due to a lack of controlled experimental manipulation (i.e., all studies use an A-B design type) and threats to internal (e.g., history and maturation) and external validity (e.g., weak descriptions of independent variables).

The current examination of weighted vests had limitations that need to be acknowledged. First, an initial baseline phase was not conducted with the first participant. Given the brevity of the experimental condition, these data would have been helpful in establishing a stronger functional relation. Second, interpretation of null findings is generally considered difficult (Kennedy, 2004). Future research is necessary to substantiate the results. Third, the inclusion criteria for this study were narrow (i.e., the child had to have previously worn a weighted vest). Thus, the participants of this study probably do not represent the entire population of children with autism and developmental delays, which limits the generality of the findings. Finally, but possibly most important, the relation between wearing a weighted vest and immediate behaviors was examined. Thus, a delayed effect of wearing the weighted vest would not have been detected. Other researchers have hypothesized that the effects of weighted vests may be delayed rather than immediate (e.g., Fertel-Daly et al., 2001).

Although the findings are null, there are important implications for practice. The use of weighted vests to date is based largely on theory (i.e., SI; Ayers, 1972) and precedent (Olson & Moulton, 2004), rather than science. OTs frequently use weighted vests in an effort to improve child behaviors, even in the absence of definitive empirical support and guidelines on their use (Olson & Moulton, 2004). The use of weighted vests despite empirical support has two important implications.

First, future research is warranted to examine procedures or components of weighted vests as interventions. Further research is necessary to establish recommended practice for how to use a weighted vest. Because there are no standard

guidelines or protocols for using weighted vests, procedures used in research and practice have been variable. Anecdotal field observations suggest some children wear weighted vests for a specific amount of time each day prior to engaging in activities requiring high levels of attention, and some children wear weighted vests only during activities requiring high levels of attention. Parametric analyses of duration are needed to determine the optimal dosage.

Additional research also is needed to determine the optimum amount of weight to be added to the vest. Although most researchers have used 5% of the child's body weight, there are no standard guidelines or practice recommendations for this amount. Parametric analyses of weight need to be conducted to determine the optimal weight of the vest. Finally, the desired outcomes related to the use of the weighted vest have been inconsistent across studies. Some researchers have examined decreased stereotypic behavior, and other researchers have examined increased attention. Although both behavioral changes are consistent with SI theory, it is not clear if the use of a weighted vest in the absence of other interventions can achieve both outcomes. Because the effects of wearing a weighted vest are unknown, all hypothesized changes in behavior should be measured in every study conducted.

Second, the use of weighted vests should proceed cautiously and involve close monitoring. The evidence for using weighted vests is neither sufficient to promote their widespread use nor to advocate with certainty their avoidance. Hence, practitioners will likely continue to use weighted vests. If practitioners choose to use weighted vests, clear behavioral goals (i.e., desired outcomes) should be specified a priori and systematic data collection must occur and be continually monitored.

The role of precedent and theory in developing effective interventions for children with disabilities is not in question. Effective interventions frequently start with a conceptual framework, perspective, or theory. However, theories must be tested with controlled, experimental designs and implemented with caution and methodological rigor. Furthermore, when researchers provide empirical evidence that interventions

are ineffective or aversive, practices should be avoided. Replications and procedural studies examining weighted vests are imperative if their use is to continue.

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Bios

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