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Review Journal of Autism and Developmental Disorders

ISSN 2195-7177

Rev J Autism Dev Disord
DOI 10.1007/s40489-015-0060-y



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The Teaching Interaction Procedure and Behavioral Skills Training For Individuals Diagnosed with Autism Spectrum Disorder: a Review and Commentary

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Received: 28 January 2015 / Accepted: 26 September 2015
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Abstract Teaching social behaviors and other pro-social skills is an important component of intervention for individuals diagnosed with an autism spectrum disorder (ASD). Today, there are several procedures which are being implemented clinically and evaluated empirically to improve the overall social behaviors of individuals diagnosed with ASD. Two of these procedures are the teaching interaction procedure (TIP) and behavioral skills training (BST). In this paper, we describe both TIP and BST, provide the historical context of each of these procedures, highlight the differences of the two procedures, review and analyze the empirical evidence of the two procedures, and provide recommendations to clinicians, future researchers, parents, and other professionals. The paper is both an analysis of the current literature of the two procedures and commentary based upon our clinical experience working in research settings and various clinical settings.

Keywords Behavioral skills training · Modeling · Role-playing · Teaching interaction procedure

Modeling is a strategy for teaching children with autism spectrum disorder (ASD) that has a strong evidence base (National Autism Center (NAC) 2009) and can be implemented either in vivo or via video recordings. Studies have demonstrated that modeling is effective for teaching a wide variety of skills including social (Apple et al. 2005; Bellini et al. 2007), play (D'Ateno et al. 2003; Hine and Wolery 2006; Jahr et al. 2000), and communication skills (Buffington et al. 1998; Charlop and Milstein 1989). Through the use of modeling and practice, learners have not only acquired new skills, but have also demonstrated generalization and maintenance effects (Carr and Darcy 1990; Charlop et al. 1983; Gena et al. 2005; Ihrig and Wolchick 1988; Secan et al. 1989). Researchers have utilized modeling and practice within two very similar procedures: the teaching interaction procedure (TIP) and behavioral skills training (BST).

Recently, there has been confusion between the TIP and BST as researchers have labeled procedures inaccurately (e.g., stating that a procedure is BST when in fact it is the TIP) or have stated that one procedure is a form of the other procedure. For example, Ferguson et al. (2013) stated, "A form of behavioral

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skills training called the teaching interaction procedure, has shown positive results in teaching individuals with ASD and [intellectual disabilities] social skills..." (p. 294). Given that (a) these procedures are similar across many components, (b) both procedures are being implemented with children diagnosed with ASD, and (c) there are still key differences between the two procedures, we felt it was important to conduct a review, analysis, and commentary for the two procedures.

There are several purposes for writing this paper. First, to provide a brief overview of the two procedures to increase professional and consumer familiarity with each procedure. The overview of the two procedures will describe the components of each and provide historical information and context on the origins and development of two procedures. The second purpose of this paper is to highlight the differences between the teaching interaction procedure and behavioral skills training and describe why these differences are important in the conceptualization of both procedures. Third, to provide an analysis of the empirical evidence for the two procedures as they directly relate to their implementation for individuals diagnosed with ASD. Finally, to provide recommendations for future researchers and clinicians. The content of this paper is based upon evidence available from empirical studies, writings from professional sources (e.g., books, chapters, or conferences) and the authors personal experiences working with professionals in the field of ASD and ABA in multiple settings (e.g., clinical, school, and research settings). Therefore, this paper provides an analysis and commentary for the two procedures.

Overview of the Two Procedures

Teaching Interaction Procedure

The teaching interaction procedure (TIP) is a systematic teaching package which consists of six steps (Phillips et al. 1974). The first step of the procedure involves labeling and identifying the skill to be learned within the session. The second step is providing meaningful rationales for why the learner should display the behavior, which is drawn from the learner's daily experience. Third, the targeted behavior is broken down into smaller steps and the learner verbally states each of the steps. Fourth, the teacher provides both an appropriate demonstration and inappropriate demonstration (Leaf et al. 2012a, b) of the targeted behavior; the learner must then discriminate whether a demonstration is appropriate and identify why the demonstration was appropriate or inappropriate. Fifth, the learner role-plays the targeted behavior until he or she displays 100 % of the steps correctly. The final component, feedback, occurs throughout the entire TIP, which is the use of positive reinforcement for correct responding and role-playing, and corrective feedback for incorrect responding or role-playing.

In clinical settings, there may be subtle variations in the number of steps; however, the major elements of the procedure are still implemented.

The TIP was created as a component of the Teaching Family Model; it was utilized to improve the overall functioning of pre-delinquent and delinquent youth. Phillips et al. (1974) were the first professionals to use the term "teaching interaction" when they described the procedure in *The Teaching Family Handbook*. Since the TIP was first conceptualized, it has been described in several curriculum books (e.g., Hazel et al. 1983; Dowd et al. 1994) and evaluated in various research studies (e.g., Harchik et al. 1992). In 1992, Harchik and colleagues evaluated the effectiveness of the TIP to teach group home staff members to better implement a token economy, increase the amount of time adults engage with group home members in activities, and increase the number of teaching components utilized throughout the day. The results of this study demonstrated the TIP was an effective strategy to increase all of these behaviors.

Despite professionals implementing the TIP clinically (Leaf et al. 2011), it was not until 2009 that the TIP was first empirically evaluated for individuals diagnosed with ASD (Leaf et al. 2009). Leaf and colleagues evaluated the effects of a TIP, paired with a token economy, on increasing social skills across four broad domains (i.e., social communication, social play, social emotional skills, and social friendships). The researchers utilized a multiple baseline design across skills and replicated across participants. The results indicated the TIP was successful at increasing the rate at which all of the participants demonstrated all targeted social skills. Since this research, there have been several studies that have evaluated the effectiveness of the TIP for teaching individuals diagnosed with ASD (e.g., Dotson et al. 2013; Kassardjian et al. 2013; Leaf et al. 2012a, b). Within these and other studies, the TIP has shown to be an effective teaching strategy for individuals diagnosed with ASD.

Behavioral Skills Training

A second teaching package that utilizes modeling and rehearsal is behavioral skills training (BST). BST is a multi-component training package used to teach a skill or skill set(s). BST employs four teaching techniques: instruction, modeling, rehearsal, and feedback (Miltenberger 2012). The delivery of BST involves the teacher first providing learners with written and/or verbal instructions outlining the relevant components of the target skill or skill set(s). During or following instructions, the teacher provides a model of the behavioral component. The teacher may use video modeling and/or live demonstration to model the targeted skill set(s) (Miltenberger 2012). Next, the learners are given an opportunity to rehearse or practice the behavioral component/step(s). Rehearsal may occur with actors or confederates in a simulated environment

or in a more naturalistic context with the intended population. The final component, feedback, may be conducted either during the rehearsal phase of training or after. Feedback involves the teacher identifying instances in which the participant did or did not engage in the targeted skill(s). If the participant engages in the targeted skill(s) correctly, the teacher provides praise and external reinforcement, if necessary. If the learner engages in the targeted skill(s) incorrectly, the therapist provides feedback, typically in the form of an instruction, and the learner practices again until he or she meets the performance criteria (Miltenberger 2012).

The four components that comprise BST (i.e., instruction, modeling, rehearsal, and feedback) have been used within various social skills training programs (e.g., Bornstein et al. 1977; Brady 1984; Turner et al. 1978; Whitehill et al. 1980). However, it was not until 1984 that instructions, modeling, rehearsal, and feedback were described empirically using the term “behavioral skills training” (Breidenbach 1984). Breidenbach (1984) used BST to teach 34 typically developing school-aged children, divided into three groups, appropriate anger management skills. A pre- and post-test analysis of each group’s performance identified statistically significant differences between pre- and posttest responding within two of the three groups, indicating an increase in skill acquisition for most of the participants.

Furthermore, it was not until 2004 that BST was investigated empirically within an intervention for individuals with an ASD (Sarakoff and Sturmey 2004). Using a multiple baseline design across participants, Sarakoff and Sturmey (2004) taught three special education teachers to implement discrete trial teaching with a child with an ASD. The results of this study demonstrated that the teachers achieved significant gains in the percentage of correct discrete-trial teaching responses following BST. In 2013, Kornacki et al. used BST to teach one adult with autism how to engage in a conversation with a peer. The researchers utilized naturalistic probes to measure the effects of BST on the participant’s conversation skills. The results indicated increases in conversation skills for the participant and demonstrated that the behavior maintained overtime.

Differences Between TIP and BST

While both TIP and BST consist of instruction, modeling, and role-playing, the two procedures differ in two major ways.

Rationales

One difference between the TIP and BST is providing meaningful rationales for why the student should engage in the targeted behavior. When teachers implement a TIP, they always provide a meaningful and realistic rationale for why the student

should engage in the targeted behavior, which is not a standard component of BST. When the TIP was first developed, rationales were considered a critical component for several reasons. First, it was hypothesized that the provision of rationales could result in quicker fading of supplemental reinforcement for demonstration of target behaviors. It was hypothesized that with the early introduction and pairing of potential naturally occurring consequences and with student development of an internal locus of control with the provision of rationales and that fading of artificial consequences would be facilitated (Braukmann et al. 1983). Second, rationales were utilized in an attempt to teach students that their own behavior, positive or negative, has an impact on the outcomes that they face. For example, rationales may teach a student that engaging in rude behaviors to a judge may result in the student going to prison, rather than the student viewing the judge as a means to get him/her out of prison. A third reason why rationales were considered a critical component was the presumption that the rationale would serve as a reminder to the learner of why she/he should display the behavior during naturally occurring situations.

BST has not utilized rationales as a core component (Miltenberger 2012). One reason could be that recent research has shown that rationales, as the sole intervention, may not result in behavior change (Wilder et al. 2010). Therefore, many professionals believe that adding a rationale is unnecessary and may not be the most efficient way to teach individuals diagnosed with ASD. A second reason why rationales may not be included within BST is the learners may not understand the rationale and; therefore, the rationale would have no impact on the student’s behavior. Finally, there are some instances where providing a rationale may not be appropriate for a student such as with individuals in which the prerequisite skills (e.g., receptive and expressive language) have not been thoroughly established.

Demonstrations of Inappropriate Behaviors

The second difference between the TIP and BST is found in the implementation of the modeling component. When implementing BST, the teacher typically only models the skill(s) correctly; however, when implementing a TIP, correct and incorrect models are typically provided (similar to the cool versus not cool procedure; Leaf et al. 2012a, b). Proponents of the TIP provide both a correct and incorrect demonstration for several reasons. First, social behaviors are often nuanced, and a student may not be able to discriminate between an appropriate and an inappropriate social behavior if those nuances are not highlighted. Thus, highlighting and contrasting these nuances may lead to better skill acquisition and generalization. Second, students may continually display the targeted skill(s) incorrectly within their natural environment. Providing the correct demonstration only may not highlight

what he or she is doing incorrectly. However, providing an incorrect model, in addition to the correct model, may better provide more opportunities for the learner to identify what she/he is doing incorrectly and help define the parameters of correct responding.

Proponents of BST may not demonstrate the behavior incorrectly for several reasons. First, providing an incorrect demonstration would model inappropriate behavior, which could increase the probability of the student displaying the skill(s) incorrectly. Second, a student may not require a demonstration of the incorrect response and providing an incorrect demonstration would highlight inappropriate behavior. Finally, students may find the inappropriate demonstrations reinforcing and find reinforcement value in being “naughty” and demonstrating inappropriate behaviors.

Analysis of the Two Procedures for Individuals Diagnosed with ASD

Finding the Articles

Search Procedure In order to obtain empirical articles pertaining to both the TIP and BST for individuals with ASD, we conducted four different searches of the published literature.

First, we conducted a search through the electronic database PsychINFO. To find articles, a variety of keywords were used (i.e., “modeling,” “rehearsal,” “behavioral rehearsal,” “teaching interactions,” and “behavioral skills training”). These keywords were also used with the terms “autism” and “developmental disabilities.” The articles we searched were published between the years of 1960 and 2013.

Second, we used the electronic database ERIC. A variety of keywords were used alone and in-conjunction with one another (i.e., “behavioral skills training,” “behavioral rehearsal,” and “instruction+feedback+modeling”). These keywords were also used with the terms “autism” and “developmental disabilities.” The articles we searched were published between the years of 1960 and 2013.

Third, we manually searched the abstracts for every issue of the following peer-reviewed journals: *Journal of Applied Behavior Analysis*, *Focus on Autism and Other Developmental Disorders*, *Journal of Autism and Developmental Disorders*, *Behavior Analysis in Practice*, *Research in Autism Spectrum Disorders*, *Research in Developmental Disabilities*, *Journal of Positive Behavior Interventions*, *Education and Treatment of Children*, and *Education and Training in Autism*. We selected these journals as they commonly publish research relating to both applied behavior analysis and autism. Although there may be other autism-related journals and/or

behavior analytic journals, many of these studies would be captured with ERIC or PsychINFO.

Finally, for every study that we found, we evaluated the reference section to determine if there were any articles that met our requirements for inclusion (outlined below).

Inclusion Criterion There were several criteria for a study to be included in this review. First, the study had to be published in a peer-reviewed journal. Second, the study had to be published between 1960 and 2013. Third, the study had to include one participant who had an official diagnosis or characteristics of either autistic disorder, autism spectrum disorder, Aspergers Syndrome, PDD-NOS, or Retts. Fourth, the study had to have utilized single-subject methodology and could not be a group design, review, or commentary. Fifth, the article had to either explicitly state that they utilized one of the two procedures (e.g., stating that they used behavioral skills training) or state all of the steps of either BST or TIP in the methods section if either label was not provided. Sixth, the study had to be used to target skill(s) of the individual a diagnosed with ASD. Therefore, studies where BST was use to train a staff (even if that staff was an individual diagnosed with ASD) were excluded from this review. Finally, objective data had to have been utilized as the main dependent measure.

Results of the Search The results of this search yielded a total of 43 possible articles. We excluded 29 of articles as they did not meet at least one of the inclusion criterion (outlined previously). Table 1 provides a list of all the studies that were excluded from this review, and the reason each was excluded. After excluding the 29 articles, 14 articles remained which were assigned to either TIP or BST.

Article Assignment For an article to be considered as utilizing the TIP, the researchers had to: (a) label the behavior, (b) provide a rationale to the participant, (c) break the behavior down into smaller components, (d) have the teacher demonstrate the behavior, (e) have the learner role-play the behavior, and (f) provide feedback. There were a total of eight articles included that were assigned to TIP.

For an article to be considered as utilizing BST, the researchers had to: (a) provide instructions, (b) model the behavior for the student, (c) have the learner role-play the behavior, (d) provide feedback to the learner, and (e) not provide a rationale (as this would make it a teaching interaction procedure). There were a total of six articles included that were assigned to BST.

Measurement of the Two Procedures

Independent Variables We analyzed seven independent variables across the studies that evaluated the TIP and BST. We

Table 1 Excluded articles

Author	Reason for exclusion	Author	Reason for exclusion	Author	Reason for exclusion
Arnal et al. (2007)	Training study	Love et al. (2013)	Training study	Ryan and Hemmes (2005)	Training study
Belfiore et al. (2008)	Training study	McDonnell et al. (2008)	Training study	Sarakoff and Sturmey (2004)	Training study
Brown (1989)	Conceptual paper	Miles and Wilder (2009)	Training study	Sarakoff and Sturmey (2008)	Training study
Crockett et al. (2007)	Training study	Miltenberger et al. (2008)	Not autism	Seiverling et al. (2010)	Training study
Dib and Sturmey (2007)	Training study	Nikopoulos et al. (2008)	Not BST or TIP	Seiverling et al. (2012)	Training study
Downs et al. (2008)	Training study	Nigro-Bruzzi and Sturmey (2010)	Training study	Stewart et al., (2007)	Training study
Gianoumis et al. (2012)	Training study	Nosik et al. (2013)	Training study	Summers et al. (2011)	Not BST
Graudins et al. (2012)	Training study	Oppenheim-Leaf et al. (2012a, b)	Training study	Thiessen et al. (2009)	Training study
Lafasakis and Sturmey (2007)	Training study	Palmen et al. (2010)	Training study	Ward-Horner and Sturmey (2008)	Training study
Lerman et al. (2013)	Training study	Pan-Skadden et al. (2009)	Not autism		

first evaluated the number of children diagnosed with ASD and ages of the children who were evaluated in each study. Second, we evaluated whether a TIP or BST was implemented in a one-to-one instructional format, small group instructional format, or a large group instructional format. Third, we evaluated the skills that were taught to each participant. Fourth, we evaluated how the researchers measured skill acquisition (e.g., role-play probes, naturalistic probes, and generalization probes). Fifth, we evaluated the mastery criterion utilized for each study. Sixth, we evaluated if and when generalization data was taken for each study. Seventh, we evaluated the experimental design utilized within each study. Finally, we evaluated the steps utilized that compromised the TIP or BST.

Dependent Variables We also evaluated the effectiveness of both the TIP and BST across three dependent variables. First, we evaluated the percentage of participants' skills that reached the stated mastery criterion; if no mastery criterion was stated, we evaluated the percentage of skills that showed a desired treatment effect (i.e., behavioral change in the desired direction). Second, we utilized visual analysis to assess levels of generalization; generalization effects were categorized as high, moderate, or low.

Third, we evaluated the percentage of non-overlapping data (PND) between baseline and maintenance data across all skills taught for each study (Scruggs and Mastropieri 2001). PND is a percentage calculated to signify the effectiveness of a single-subject intervention across multiple studies. To calculate PND, we first identified the highest baseline data point. Next, we determined the number of maintenance sessions. Then, we calculated the number of maintenance sessions that were higher than baseline divided by the total number of maintenance sessions (Scruggs and Mastropieri 2001). For example,

if there were 9 maintenance sessions above the highest baseline data point and 10 total intervention sessions, we divided 9 by 10 and multiplied by 100 to get a PND score of 90 %. Scores equal to or greater than 90 % were categorized as highly effective, 70 to 89 % was categorized as moderately effective, 50 to 69 % was categorized as minimally effective, and below 50 % was categorized as ineffective.

We did not utilize PND to evaluate data taken during intervention, as PND does not accurately take into account learning curves. For example, if the highest point in baseline was 0 % of steps displayed correctly and during the first intervention session the participant displayed 0 % of steps displayed correctly followed by 100 % (intervention session 2), 100 % (intervention session 3), and 100 % (intervention session 4) of steps correctly, most clinicians and researchers would regard the results as outstanding; however, this would yield a PND score of 75 % which falls in the moderately effective category. Therefore, PND should be limited to comparisons of pre-intervention to post-intervention.

Levels of Effectiveness We analyzed the measures taken on dependent variables (described above) to determine whether the TIP or BST implemented in each study was effective, somewhat effective, or ineffective. For a study to be categorized as effective, the participants had to reach mastery criterion on at least 85 % of all skills taught, demonstrate high levels of generalization, and obtain a PND score that equated to moderate to high levels of maintenance. For a study to be categorized as somewhat effective, the participant had to reach mastery criterion on 75 to 84 % of skills taught, show varied levels of generalization, and obtain a PND score that equated to moderate to high levels of maintenance. A study was categorized as ineffective if the participant met any of the following conditions: reached mastery criterion on less than 74 % of

Table 2 IV information

TIP or BST	Name and year	No. of participants with ASD	Age range	Instructional formats	Skills taught	How measured skill acquisition	Mastery criterion	Gen	Design	Steps in procedure
TIP	Leaf et al. 2009	3	5 to 7	1 to 1	Play, conversation, emotional, choosing the same friend	Naturalistic probes	Not Stated	None	Multiple Baseline Across Behaviors	Label and define, rationale, skill steps, when to utilize the skill, modeling, role-play, and feedback
TIP	Leaf et al. 2010	5	4 to 6	Large group	Showing appreciation, giving a compliment, empathy, changing the game	Role-play probes	100 % across 3 consecutive probes	Pre and Post	Multiple probe design across behaviors	Label, rationale, when to utilize the skill, behavioral steps, modeling, role-play, and feedback
TIP	Dotson et al. 2010	4	13 to 18	Large group	Conversational basics, providing positive feedback, answering questions	Role-play probes	100 % across 3 consecutive probes	Pre and Post	Multiple Probe Design Across Behaviors	Label, rationale, when to utilize the skill, behavioral steps, modeling, role-play, and feedback
TIP	Leaf et al. 2012a, b	6	5 to 13	1 to 1	Various social skills	Naturalistic probes	100 % across 3 consecutive probes	Pre and Post	Parallel Treatment Design	Label, rationale, when to utilize the skill, behavioral steps, modeling, role-play, and feedback
TIP	Oppenheim-Leaf et al. 2012a, b	2	7 to 5	Small group	Board games	Naturalistic probes	80 % or above stably	Pre and Post	Multiple Probe Design Across Behaviors	Label, rationale, behavioral steps, modeling, role-playing, and feedback
TIP	Dotson et al. 2013	5	19 to 30	Large group	Vocational tasks	Naturalistic probes	Increase in behavior	Post only	Multiple probe design across behaviors	Describing the skill, when to utilize the skill, rationale, behavioral steps, modeling, role-playing, and feedback
TIP	Kassardjian et al. 2013	5	4 to 13	1 to 1	Expansion of conversation, responding to peers, greetings, and sportsmanship	Role-play probes	80 % or above for 3 consecutive Probes	Post only	Multiple baseline design across participants and behaviors	Labeling and identification, rationale, behavioral steps, modeling, role-playing, and feedback
TIP	Ferguson et al. 2013	8	7 to 11	Large group	Giving compliments, taking turns, positive post game comment	Naturalistic probes	Not stated	Post	Multiple baseline across behaviors	Label, rationale, modeling, role-play, and feedback
BST	Burke et al. (2010)	6	18-27	1 to 1	Job skill training	Analogue probes	80 %	Post	Multiple baseline across participants	Instruction, modeling, rehearsal, feedback, and a cue
BST	Gunby et al. (2010)	3	6-8	1 to 1	Abduction prevention	Probes	100 % across all lures	Post for only 1	Multiple baseline across participants	Instruction, modeling, rehearsal, feedback,
BST	Kornacki et al. (2013)	1	21	1 to 1	Engaging in a conversation with a peer	Naturalistic practice probes	Not stated	None	Multiple baseline design across participants with an add-in component analysis	Instructions, modeling, rehearsal, feedback, in situ training with feedback
BST	Nuernberger et al. (2013)	3	19-23	1 to 1	Conversation skills	Probes	Not stated	None	Multiple baseline across participants	Instruction, modeling, rehearsal, feedback,

Table 2 (continued)

TIP or BST year	Name and year	No. of participants with ASD	Age range	Instructional formats	Skills taught	How measured skill acquisition	Mastery criterion	Gen	Design	Steps in procedure
BST	Palmen and Didden (2012)	6	15–30	Group	Task engagement	Probes	Not stated	None	Multiple baseline across participants	Instruction, modeling, rehearsal, feedback, plus video
BST	Taras et al. (1988)	2	9–10	1 to 1	Child 1: appropriate content of speech, appropriate sitting, eye contact, appropriate affect, perseverance, appropriate social behavior Child 2: eye contact, appropriate content of speech, appropriate sitting, and appropriate behavior	Probes	Not stated	None	Multiple baseline design across behaviors	Practice and feedback

skills, demonstrated low levels of generalization, or obtained a PND score that equated to minimally effective or ineffective. If a study did not measure generalization or maintenance, then that measure was not calculated in the determination of the effectiveness of the procedure within that study.

Analysis

Teaching Interaction Procedure There were a total of eight studies that met the inclusion criteria for the TIP. The authors of all eight studies explicitly identified the intervention they employed as a TIP, although one of the studies (Ferguson et al. 2013) also referred to the TIP as a form of BST. Three studies did not meet all of the inclusion criteria.

Table 2 displays the results across the different evaluations conducted on the independent variables for the TIP. All eight studies utilized single subject designs; however, one study also analyzed its data utilizing inferential statistics (Ferguson et al. 2013). Across these eight studies, there were a total of 38 participants with ages ranging from 4 to 30 years old; the majority of studies evaluated participants who would be in kindergarten or early elementary school. The TIP has been most commonly implemented to teach social behaviors for children with ASD, with one study specifically teaching conversational and vocational skills (Dotson et al. 2010). Skill acquisition was determined one of two ways: role-play probes or naturalistic probes. Role-play probes are a methodologically weak method to measure skill acquisition, as they are part of the teaching procedure and can be heavily influenced by the model that occurred previously and/or the feedback received throughout the TIP. Naturalistic probes are a more stringent method to measure skill acquisition, as they occur prior to teaching. No priming, prompting, or reinforcement is provided that could affect performance, so performance is more likely to represent the individual's response in everyday life.

Table 3 provides the results of the evaluations conducted on the dependent variables for studies that utilized the TIP. Six studies were classified as being effective, one study was determined to be somewhat effective, and one study was determined to be ineffective. The TIP implemented by Ferguson et al. (2013) was considered to be a somewhat effective study because, across all of the participants, there were varying and adequate levels of generalization. The TIP implemented by Dotson et al. (2010) was considered to be ineffective due to low levels of generalization. The majority of the research has shown that the TIP was effective in teaching the targeted skill(s) to individuals diagnosed with ASD; participants were able to reach mastery criterion on the majority of skills taught and showed high levels of maintenance.

Behavioral Skills Training The results of our independent variable analysis can also be found on Table 2. All six studies used a variation of the multiple baseline design. There were a total of 21 participants who have been taught using BST. The ages ranged from 6 years old to 30 years old, with the majority of studies utilizing adolescents or adults. There were a wide variety of skills taught to the 21 participants and included task engagement, job skills training, and conversation skills. Probes were the primary measure used to evaluate behavior change.

Table 3 provides results for the evaluations conducted across the dependent variables of the six studies that utilized BST. All but Burke et al. (2010) showed that participants reached mastery criterion or an increase in the rate of the targeted behavior following intervention. There were varying levels of generalization displayed after intervention; however, three studies (i.e., Kornacki et al. 2013; Palmen and Didden 2012; Taras et al. 1988) did not evaluate generalization. When we evaluated PND for maintenance, four of the six studies yielded highly effective results. Overall, according to our criterion, three of the studies were classified as effective, one as somewhat effective, and two as ineffective.

Conclusions and Recommendations

The purpose of this paper was to describe two procedures commonly implemented with individuals diagnosed with ASD, clarify the conceptual framework of each procedure, and evaluate the empirical research of each procedure as it applies to individuals diagnosed with ASD. The TIP and BST have a long history in the field of ABA. Both have been implemented clinically with hundreds of individuals diagnosed with and without ASD, and both have been evaluated in peer-reviewed empirical research. Additionally, the TIP and BST share common components including labeling, demonstration, role-play, and feedback. Despite these similarities, there are differences between the two procedures including the provision of a rationale and the type of demonstrations implemented, and given these differences, it is important for both researchers and professionals to appropriately label the procedure utilized.

Unfortunately, we have observed within the literature base and during clinical observations that the procedures are being mislabeled or that the terminology has changed over time (e.g., procedures that fit the definition of a TIP are being labeled BST). Clinicians and researchers will often label a procedure BST when they are, in actuality, implementing a TIP (i.e., providing rationales and incorrect models). When researchers and professionals label the procedure being evaluated incorrectly they lack conceptual precision, which could

Table 3 DV information

TIP or BST	Name and year	Percentage of skills reach mastery criterion or behavior change demonstrated by participant	Levels of generalization	PND for maintenance levels	Overall effects
TIP	Leaf et al. 2009	100 % of skills increase demonstrated	No generalization measures taken	88.6 % Moderately effective	Effective
TIP	Leaf et al. 2010	93.75 % reached mastery criterion	Varying levels	94.6 % Highly effective	Effective
TIP	Dotson et al. 2010	100 % reached mastery criterion	Low levels	81.9 % Moderately effective	Ineffective
TIP	Leaf et al. 2012a, b	100 % reached mastery criterion	High levels	97.2 % Highly effective	Effective
TIP	Oppenheim-Leaf et al. 2012a, b	100 % reached mastery criterion	High levels	96.7 % Highly effective	Effective
TIP	Dotson et al. 2013	85.7 % of skills increase demonstrated	High levels	100 % Highly effective	Effective
TIP	Kassardjian et al. 2013	100 % reached mastery criterion	High levels	93.8 % Moderately effective	Effective
TIP	Ferguson et al. 2013	No Mastery Criterion. Statistics utilized. Significant Difference Across all skills and participants	Varying levels	None taken	Somewhat effective
BST	Burke et al. (2010)	33.33 % in Study 1 100 % in study 2 50 % across both	High levels	100 % Highly effective	Ineffective
BST	Gunby et al. (2010)	100 %	High Levels	100 % Highly effective	Effective
BST	Nuemberger et al. (2013)	100 %	Not taken	100 % Highly effective	Effective
BST	Kornacki et al. (2013)	100 % of skills increase demonstrated	No generalization measures taken	100 % Highly effective	Effective
BST	Palmen and Didden (2012)	100 %	Not taken	68 % Minimally effective	Ineffective
BST	Taras et al. (1988)	100 % of skills demonstrated desired behavior change	No generalization measures taken	55 % Questionable effectiveness	Somewhat effective

hinder clarity in understanding efficient and effective means to change behavior (Baer et al. 1968). In the future, when rationales are included with labeling, demonstration, role-play, and feedback, researchers and professionals should label the procedure as a TIP. When rationales are not included with labeling, demonstration, role-play, and feedback, the procedure should be labeled as BST. Doing this will help facilitate future comparative research and better allow determination of whether the use of rationales is an important component of behavior change procedures. With this clarity in our terms, practitioners could have clear and accurate information about which procedures they should adopt in their clinical work.

Some professionals have suggested that instead of labeling specific procedures (e.g., the teaching interaction procedure or behavioral skills training), we should just describe them by their component parts (e.g., labeling, rationales, modeling, role-playing, and feedback). Although this might be more technically correct and more scientific in nature (Baer et al. 1968), labeling procedures solely by their component parts

could hinder the adoption of the field of ABA by the mainstream. That is, providing consistent labels for procedures (e.g., TIP, BST, discrete trial training, etc.) is more user-friendly for the consumer of our services. ABA is not merely a science of human behavior, but also an applied clinical and service discipline, which allows a great number of professionals (e.g., teachers, clinicians, and interventionists) to help an even greater number of individuals. Providers and consumers alike operate in environments that adopt, communicate about, train in, and utilize interventions at the procedural (as apposed to the component) level (e.g., discrete trial teaching, habit reversal, pivotal response training, and token economies). Further, and unfortunately, there are several procedures with little to no empirical support (e.g., social stories, social thinking, or floortime) utilized during intervention with individuals diagnosed with ASD. All of these procedures are carefully and attractively labeled, have names with face validity and marketing appeal to consumers, and, in some instances, are trademarked. To adequately support applied

intervention with empirically supported methodologies and be accessible to its consumers, it behooves the field of ABA to label its procedures consistently and correctly and not just refer to them by their component parts.

A second mistake observed in the literature and in general clinical practice is that many professionals have stated that the TIP is a form of BST (Ferguson et al. 2013). The TIP was created in the early years of ABA, and the term “teaching interactions” was coined in the literature 10 years prior to the introduction of BST. Therefore, it is more historically accurate to describe BST as a form/variation of the TIP, and not the other way around. Many professionals today are not familiar with the history of the field of ABA; however, it is important that we protect our history and portray it accurately both within the field and to the general public. We have, for example, seen that professionals commonly misstate what occurred at the UCLA Young Autism Project (e.g., minimum of 40 hours per week versus an average of 40 hours per week; Leaf 2015), no longer understand respondent conditioning and its place in the history of ABA (Leaf 2015), and disregard shaping as a behavior change strategy in favor of prompting. We hope that future professionals in the field will begin to better understand the history of the field and the origins of widely implemented procedures. This may lead to better understanding of the theoretical basis for intervention procedures as well as rationales for choosing between available procedures which in turn can yield better results in our clinical work with individuals with ASD.

The main difference between the TIP and BST is the provision of the rationale. The research on the use of rationales remains mixed. That is, some studies have shown rationales to be important during skill acquisition (Braukmann et al. 1983), and some studies have demonstrated rationales are not an important component in skill acquisition (Wilder et al. 2010). The issue of whether rationales are an effective or essential component in the context of the TIP is an unanswered empirical question. Future researchers need to compare the TIP to BST to determine if rationales are actually a critical component. This evaluation should go beyond mere skill acquisition and evaluate generalization, long-term maintenance, development of cause and effect concepts, and whether supplemental reinforcement can be faded quicker with the provision of a rationale. If rationales lead to improvements in these areas, then clinicians should elect to implement the TIP as opposed to BST. Additionally, it may be that rationales are more important with certain populations or for teaching certain kinds of skills and this too needs to be explored empirically.

The evaluation and analysis of the TIP and BST for individuals diagnosed with ASD have shown that both procedures are effective. In addition, both procedures have been evaluated with populations other than ASD and have met the criterion to be considered evidence based (Horner et al. 2005). However,

more research is required with both procedures to identify the conditions under which each is effective, particularly with regard to population-specific outcomes. There have been a limited number of studies using either procedure to teach individuals with ASD specific skills. Future researchers should continue to evaluate the procedures with more individuals diagnosed with ASD and on a wider range of skills. Second, most of the participants have been higher functioning, and it is unknown if the procedures would be effective for lower functioning individuals diagnosed with ASD or what the prerequisites for the procedures to be effective. Third, future research should also examine training novice professionals and parents on both procedures. Finally, both procedures could be compared to other common alternative procedures (e.g., social thinking, social stories, and floortime) and other behavioral analytic procedures (e.g., video modeling, script fading, and discrete trial teaching) to identify the most effective and efficient procedures.

In conclusion, the TIP and BST are two procedures that are similar, yet separated by a key difference that warrants a conceptual and technical separation of the two procedures. Professionals in the field of ABA should be familiar with both procedures, understand the history of both procedures, and be able to identify the differences between the two procedures, at least until it is determined whether the differences are important in terms of skill acquisition. Despite their differences, both procedures are effective and parents and professionals are well-advised to continue to implement them with individuals diagnosed with ASD.

References

- Apple, A. L., Billingsley, F., & Schwartz, I. S. (2005). Effects of video modeling alone and with self-management on compliment-giving behaviors of children with high-functioning ASD. *Journal of Positive Behavior Interventions, 7*, 33–46.
- Arnal, L., Fazzio, D., Martin, G. L., Yu, C. T., Keilback, L., & Starke, M. (2007). Instructing university students to conduct discrete-trials teaching with confederates simulating children with autism. *Developmental Disabilities Bulletin, 35*, 131–147.
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1*, 91–97.
- Belfiore, P. J., Fritts, K. M., & Herman, B. C. (2008). The role of procedural integrity using self-monitoring to enhance discrete trial instruction (DTI). *Focus on Autism and Other Developmental Disabilities, 23*(2), 95–102.
- Bellini, S., Akullian, J., & Hopf, A. (2007). Increasing social engagement in young children with autism spectrum disorders using video self-modeling. *School Psychology Review, 36*, 80.
- Bornstein, M. R., Bellack, A. S., & Hersen, M. (1977). Social skills training for unassertive children: a multiple baseline analysis. *Journal of Applied Behavior Analysis, 10*, 183–195.

- Brady, J. P. (1984). Social skills training for psychiatric patients, II: clinical outcome studies. *The American Journal of Psychiatry*, *141*, 491–498.
- Braukmann, P. D., Ramp, K. K., Braukman, C. J., Wilner, A. G., & Wolf, M. M. (1983). The analysis and training of rationales for child care workers. *Children and Youth Services Review*, *5*, 177–194.
- Breidenbach, D. C. (1984). Behavioral skills training for students: a preventive program. *Children and Schools*, *6*, 231–240.
- Brown, W. H. (1989). A naturalistic teaching strategy to promote young children's peer interactions. *Teaching Exceptional Children*.
- Buffington, D. M., Krantz, P. J., McClannahan, L. E., & Poulson, C. L. (1998). Procedures for teaching appropriate gestural communication skills to children with autism. *Journal of Autism and Developmental Disorders*, *28*, 535–545.
- Burke, R. V., Andersen, M. N., Bowen, S. L., Howard, M. R., & Allen, K. D. (2010). Evaluation of two instruction methods to increase employment options for young adults with autism spectrum disorders. *Research in Developmental Disabilities*, *31*(6), 1223–1233.
- Carr, E. G., & Darcy, M. (1990). Setting generality of peer modeling in children with autism. *Journal of Autism and Developmental Disorders*, *20*, 45–59.
- Charlop, M. H., & Milstein, J. P. (1989). Teaching autistic children conversational speech using video modeling. *Journal of Applied Behavior Analysis*, *22*, 275–285.
- Charlop, M. H., Schreibman, L., & Tyron, A. S. (1983). Learning through observation: the effects of peer modeling on acquisition and generalization in autistic children. *Journal of Abnormal Child Psychology*, *11*, 355–366.
- Crockett, J. L., Fleming, R. K., Doepke, K. J., & Stevens, J. S. (2007). Parent training: acquisition and generalization of discrete trials teaching skills with parents of children with autism. *Research in Developmental Disabilities*, *28*(1), 23–36.
- D'Ateno, P., Mangiapanello, K., & Taylor, B. A. (2003). Using video modeling to teach complex play sequences to a preschooler with autism. *Journal of Positive Behavior Interventions*, *5*, 5–11.
- Dib, N., & Sturmey, P. (2007). Reducing student stereotypy by improving teachers' implementation of discrete-trial teaching. *Journal of Applied Behavior Analysis*, *40*(2), 339–343.
- Dotson, W. H., Leaf, J. B., Sheldon, J. B., & Sherman, J. A. (2010). Group teaching of conversational skills to adolescents on the autism spectrum. *Research in Autism Spectrum Disorders*, *4*, 199–209.
- Dotson, W. H., Richman, D. M., Abby, L., Thompson, S., & Plotner, A. (2013). Teaching skills related to self-employment to adults with developmental disabilities: an analog analysis. *Research in Developmental Disabilities*, *34*, 2336–2350.
- Dowd, T., Czyz, J. D., O'Kane, S. E., & Elfson, A. (1994). *Effective skills for child-care workers: a training manual from boys town*. Boys Town, NE: Boys Town Press.
- Downs, A., Downs, R. C., & Rau, K. (2008). Effects of training and feedback on discrete trial teaching skills and student performance. *Research in Developmental Disabilities*, *29*(3), 235–246.
- Ferguson, B. R., Gillis, J. M., & Sevlever, M. (2013). A brief group intervention using video games to teach sportsmanship skills to children with autism spectrum disorders. *Child and Family Behavior Therapy*, *35*, 293–306.
- Gena, A., Couloura, S., & Kymissis, E. (2005). Modifying the affective behavior of preschoolers with autism using in-vivo or video modeling and reinforcement contingencies. *Journal of Autism and Developmental Disorders*, *35*, 545–556.
- Gianoumis, S., Seiverling, L., & Sturmey, P. (2012). The effects of behavior skills training on correct teacher implementation of Natural Language Paradigm teaching skills and child behavior. *Behavioral Interventions*, *27*, 57–74.
- Graudins, M. M., Rehfeldt, R. A., DeMattei, R., Baker, J. C., & Scaglia, F. (2012). Exploring the efficacy of behavioral skills training to teach basic behavior analytic techniques to oral care providers. *Research in Autism Spectrum Disorders*, *6*(3), 978–987.
- Gunby, K. V., Carr, J. E., & Leblanc, L. A. (2010). Teaching abduction-prevention skills to children with autism. *Journal of Applied Behavior Analysis*, *43*(1), 107–112.
- Harchik, A. E., Sherman, J. A., Sheldon, J. B., & Strouse, M. C. (1992). Ongoing consultation as a method of improving performance of staff members in a group home. *Journal of Applied Behavior Analysis*, *25*, 599–610.
- Hazel, J. S., Schumaker, J. B., Sherman, J. A., & Sheldon-Wildgen, J. (1983). Group training for social skills: a program for court-adjudicated, probationary youths. *Criminal Justice and Behavior*, *9*, 35–53.
- Hine, J. F., & Wolery, M. (2006). Using point-of-view video modeling to teach play to preschoolers with autism. *Topics in Early Childhood Special Education*, *26*, 83–93.
- Horner, R. H., Carr, E. G., Halle, J., McGee, J., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, *71*, 165–179.
- Ihrig, K., & Wolchick, S. A. (1988). Peer versus adult models and autistic children's learning: acquisition, generalization, and maintenance. *Journal of Autism and Developmental Disorders*, *18*, 67–79.
- Jahr, E., Eldevik, S., & Eikeseth, S. (2000). Teaching children with autism to initiate and sustain cooperative play. *Research in Developmental Disabilities*, *21*, 151–169.
- Kassardjian, A., Taubman, M., Rudrud, E., Leaf, J. B., Edwards, A., McEachin, J., Leaf, R., & Schulze, K. (2013). Utilizing teaching interactions to facilitate social skills in the natural environment. *Education and Training in Autism and Developmental Disabilities*, *48*, 245–257.
- Kornacki, L. T., Ringdahl, J. E., Sjostrom, A., & Nuernberger, J. E. (2013). A component analysis of a behavioral skills training package used to teach conversational skills to young adults with autism spectrum and other developmental disorders. *Research in Autism Spectrum Disorders*, *7*, 1370–1376.
- Lafasakis, M., & Sturmey, P. (2007). Training parent implementation of discrete-trial teaching: effects on generalization of parent teaching and child correct responding. *Journal of Applied Behavior Analysis*, *40*(4), 685–689.
- Leaf, J. B., Taubman, M., Bloomfield, S., Palos-Rafues, L., Leaf, R., McEachin, J., & Oppenheim, M. L. (2009). Increasing social skills and pro-social behavior for three children diagnosed with autism through the use of a teaching package. *Research in Autism Spectrum Disorders*, *3*, 275–289.
- Leaf, J. B., Dotson, W. H., Oppenheim, M. L., Sheldon, J. B., Sherman, J. A., et al. (2010). The effectiveness of a group teaching interaction procedure for teaching social skills to young children with a pervasive developmental disorder. *Research in Autism Spectrum Disorders*, *4*, 186–198.
- Leaf, J. B., Oppenheim-Leaf, M. L., Sheldon, J. B., Sherman, J. A., Taubman, M., McEachin, J., Dayharsh, J., & Leaf, R. (2012a). Comparing the teaching interaction procedure to social stories for people with autism. *Journal of Applied Behavior Analysis*, *45*, 281–298.
- Leaf, J. B., Tsuji, K. H., Griggs, B., Edwards, A., Taubman, M., McEachin, J., Leaf, R., & Oppenheim-Leaf, M. L. (2012b). Teaching social skills to children with autism using the cool versus not cool procedure. *Education and Training in Autism and Developmental Disabilities*, *47*, 165–175.
- Leaf, R. B., Taubman, M. T., McEachin, J. J., Leaf, J. B., & Tsuji, K. H. (2011). A program description of a community-based intensive behavioral intervention program for individuals with autism spectrum disorders. *Education and Treatment of Children*, *34*, 259–285.

- Leaf, R. B. (2015). The Iovaas model: love it or hate it, but at least understand it!" Paper Presented at the *Evidence Based Autism Spectrum Disorder Intervention*, Las Vegas, NV.
- Lerman, D. C., Hawkins, L., Hoffman, R., & Caccavale, M. (2013). Training adults with an autism spectrum disorder to conduct discrete-trial training for young children with autism: a pilot study. *Journal of Applied Behavior Analysis*, *46*, 465–478.
- Love, J. R., Carr, J. E., LeBlanc, L. A., & Kisamore, A. N. (2013). Training behavioral research methods to staff in an early and intensive behavioral intervention setting: a program description and preliminary evaluation. *Education and Treatment of Children*, *36*, 139–160.
- McDonnell, A., Sturmey, P., Oliver, C., Cunningham, J., Hayes, S., Galvin, M., et al. (2008). The effects of staff training on staff confidence and challenging behavior in services for people with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *2*(2), 311–319.
- Miles, N. I., Wilder, D. A. (2009). The effects of behavioral skills training on caregiver implementation of guided compliance, *42*(2), 405–410.
- Miltenberger, R. G. (2012). *Behavioral skills training procedures* (Behavior modification: principles and procedures, pp. 251–269). Belmont: Wadsworth, Cengage Learning.
- Miltenberger, R., Gross, A., Knudson, P., Bosch, A., Jostad, C., & Breitwieser, C. B. (2008). Evaluating behavioral skills training with and without simulated in situ training for teaching safety skills to children. *Education and Treatment of Children*, *32*(1), 63–75.
- National Autism Center (NAC). (2009) National standards report. Retrieved from <http://www.nationalautismcenter.org/nsp/reports.php>
- Nigro-Bruzzi, D., & Sturmey, P. (2010). The effects of behavioral skills training on mand training by staff and unprompted vocal mands by children. *Journal of Applied Behavior Analysis*, *43*(4), 757–761.
- Nikopoulos, C. K., Canavan, C., & Nikopoulou-Smyrni, P. (2008). Generalized effects of video modeling on establishing instructional stimulus control in children with autism: results of a preliminary study. *Journal of Positive Behavior Interventions*, *11*(4), 198–207.
- Nosik, M. R., Williams, W. L., Garrido, N., & Lee, S. (2013). Comparison of computer based instruction to behavior skills training for teaching staff implementation of discrete-trial instruction with an adult with autism. *Research in Developmental Disabilities*, *34*(1), 461–468.
- Nuernberger, J. E., Ringdahl, J. E., Vargo, K. K., Crumpecker, A. C., & Gunnarsson, K. F. (2013). Using a behavioral skills training package to teach conversation skills to young adults with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *7*(2), 411–417.
- Oppenheim-Leaf, M. L., Leaf, J. B., Dozier, C., Sheldon, J. B., & Sherman, J. A. (2012a). Teaching typically developing children to promote social play with their siblings. *Research in Autism Spectrum Disorders*, *6*, 777–791.
- Oppenheim-Leaf, M. L., Leaf, J. B., & Call, N. A. (2012b). Teaching board games to two children with an autism spectrum disorder. *Journal of Developmental and Physical Disabilities*, *24*, 347–358.
- Palmen, A., & Didden, R. (2012). Task engagement in young adults with high-functioning autism spectrum disorders: Generalization effects of behavioral skills training. *Research in Autism Spectrum Disorders*, *6*(4), 1377–1388.
- Palmen, A., Didden, R., & Korzilius, H. (2010). Effectiveness of behavioral skills training on staff performance in a job training setting for high-functioning adolescents with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *4*(4), 731–740.
- Pan-Skadden, J., Wilder, D. A., Sparling, J., Severtson, E., Donaldson, J. M., Postma, N., et al. (2009). The use of behavioral skills training and in-situ training to teach children to solicit help when lost: A preliminary investigation. *Education and Treatment of Children*, *32*(3), 359–370.
- Phillips, E. L., Phillips, E. A., Fixsen, D. L., & Wolf, M. M. (1974). *The teaching-family handbook*. Lawrence, KS: University of Kansas Printing Service.
- Ryan, C. S., & Hemmes, N. S. (2005). Post-training discrete-trial teaching performance by instructors of young children with autism in early intensive behavioral intervention. *The Behavior Analyst Today*, *6*(1), 1–12.
- Sarakoff, R. A., & Sturmey, P. (2004). The effects of behavioral skills training on staff implementation of discrete-trial teaching. *Journal of Applied Behavior Analysis*, *37*, 535–538.
- Sarakoff, R. A., & Sturmey, P. (2008). The effects of instructions, rehearsal, modeling, and feedback on acquisition and generalization of staff use of discrete trial teaching and student correct responses. *Research in Autism Spectrum Disorders*, *2*(1), 125–136.
- Scruggs, T. E., & Mastropieri, M. A. (2001). How to summarize single-participant research: Ideas and applications. *Exceptionality*, *9*, 227–244.
- Secan, K. E., Egel, A. L., & Tilley, C. S. (1989). Acquisition, generalization, and maintenance of question-answering skills in autistic children. *Journal of Applied Behavior Analysis*, *22*, 181–196.
- Seiverling, L., Pantelides, M., Ruiz, H. H., & Sturmey, P. (2010). The effect of behavioral skills training with general-case training on staff chaining of child vocalizations within natural language paradigm. *Behavioral Interventions*, *25*, 53–75.
- Seiverling, L., Williams, K., Sturmey, P., & Hart, S. (2012). Effects of behavioral skills training on parental treatment of children's food selectivity. *Journal of Applied Behavior Analysis*, *45*(1), 197–203.
- Stewart, K. K., Carr, J. E., & LeBlanc, L. A. (2007). Evaluation of family-implemented behavioral skills training for teaching social skills to a child with asperger's disorder. *Clinical Case Studies*, *6*, 252–262.
- Summers, J., Tarbox, J., Findel-Pyles, R. S., Wilke, A. E., Bergstrom, R., & Williams, W. L. (2011). Teaching two household safety skills to children with autism. *Research in Autism Spectrum Disorders*, *5*(1), 629–632.
- Taras, M. E., Matson, J. L., & Leary, C. (1988). Training social interpersonal skills in two autistic children. *Journal of Behavioral Therapy and Experimental Psychiatry*, *19*, 275–280.
- Thiessen, C., Fazzino, D., Arnal, L., Martin, G. L., Yu, C. T., & Keilback, L. (2009). Evaluation of a self-instructional manual for conducting discrete-trials teaching with children with autism. *Behavior Modification*, *33*(3), 360–373.
- Turner, S. M., Hersen, M., & Bellack, A. S. (1978). Social skills training to teach prosocial behaviors in an organically impaired and retarded patient. *Journal of Behavior Therapy and Experimental Psychiatry*, *9*, 253–258.
- Ward-Homer, J., & Sturmey, P. (2008). The effects of general-case training and behavioral skills training on the generalization of parents' use of discrete-trial teaching, child correct responses, and child maladaptive behavior. *Behavioral Interventions*, *23*(4), 271–284.
- Whitehill, M. B., Hersen, M., & Bellack, A. S. (1980). Conversation skills training for socially isolated children. *Behaviour Research and Therapy*, *18*, 217–225.
- Wilder, D. A., Allison, J., Nicholson, K., Abellon, O. E., & Sauliner, R. (2010). Further evaluation of antecedent interventions on compliance: the effects of rationales to increase compliance among preschoolers. *Journal of Applied Behavior Analysis*, *43*, 601–613.