The Effects of Behavioral Skills Training on Teachers' Implementation of Guided Compliance

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Abstract

The current study analyzed the effectiveness of a behavioral skills training package and an instruction plus feedback component on the correct implementation of the 3-step guided compliance procedure. Special education teachers received training on 3-step guided compliance to increase compliance rates of four students with autism. The experimenters collected data on teachers' accuracy of implementation and corresponding student compliance levels. Training teachers using typical school consultation procedures (i.e., instruction plus feedback) and behavioral skills training resulted in increased accuracy of implementation of the 3-step guided compliance intervention and an increase in levels of student compliance. Furthermore, the experimenters observed highest levels of accurate treatment implementation and child compliance during the packaged behavioral skills training component.

1. Introduction

Many children with Autism Spectrum Disorders (ASD) exhibit disruptive behaviors in the classroom setting, and many teachers are unable to appropriately intervene on these problem behaviors. Among the most frequently identified disruptive behaviors in schools are noncompliance with adult instructionsand subsequent tantruming(Ducharme & Ng, 2012). Various studies have evaluated interventions to decrease noncompliance in the educational setting.

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These interventions can be classified into two categories: antecedent-based strategiesand consequent-based strategies(Wilder & Atwell, 2006). However, antecedent-based interventions such as the high-probability sequence, statements describing why to follow instructions, warnings, and non-contingent reinforcement have either shown mixed results or have been proven to be largely ineffective in decreasing noncompliance (e.g., Ardoin, Martens, & Wolfe, 1999; Cote, Thompson, & McKerchar, 2005; Rortvedt & Miltenberger, 1994). Likewise, results of studies employing consequent-based strategies such as positive reinforcement strategies and time-out from reinforcement have shown mixed results or may not always be appropriate in the school environment (e.g., Baer, Rowbury, & Baer, 1973; Rortvedt & Miltenberger, 1994; Weisberg & Clements, 1977).

One strategy that has received increased attention in the behavior analytical literature as an effective intervention to decrease noncompliance is guided compliance (Miles & Wilder, 2009), which was first introduced by Horner and Keilitz in 1975. Although numerous variations of the strategy exist in the literature, the intervention typically consists of the delivery of gradually more intrusive prompts (i.e., verbal prompt, model prompt, physical guidance) following the child's noncompliance to adult instructions. Several mechanisms may be responsible for the behavior change that occurs with guided compliance. According to Wilder and colleagues (2012), the behavioral mechanism of escape extinction used when guided compliance is implemented may contributeto the decrease in undesirable behaviors demonstrated with this procedure. With escape extinction in the form of physical guidance, the child's attempt to escape or avoid task demands is no longer reinforced; thus resulting in decreased noncompliance. Another possible reason for increased compliance may be that the physical guidance component could have functioned as a punisher, thus increasing compliance rates in participants (Wilder & Atwell, 2006). A third possible mechanism responsible for the effects of the 3-step guided compliance procedure may be negative reinforcement in that students are able to avoid physical guidance (or any further prompt) by complying with task demands. Regardless of the mechanism responsible for behavior change, guided compliance appears to be a viable intervention across settings(Wilder & Atwell, 2006; Wilder et al., 2012).

In order to produce the desired effects in the school setting, behavioral strategies, including guided compliance,must be implemented with high accuracy.

However, special education teachers may be untrained and have greater difficulty managing disruptive behaviorsin the classroom setting as they lack the knowledge and skills to effectively handle and decrease these inappropriate behaviors. Hence, the teachers' skill deficit may lead to unintentional maintenance of problematic behaviors in the school setting (Fox, Dunlap, & Cushing, 2002).

One strategy experimenters have used to train parents and stafftoimplement guided compliance is behavioral skills training (BST). BST employs the combinationof instruction, modeling, rehearsal, praise, and corrective feedback to teach a specific skill set (Horner & Keilitz, 1975). Recent studies have examined the effectiveness of BST to train parents to conduct functional assessments and select effective treatments (Shayne & Miltenberger, 2013), teach parents to implement guided compliance (Miles & Wilder, 2009), promote safe and correct guarding responses of staff members working with children with multiple disabilities (Nabeyama & Sturmey, 2010), teach staff chaining of vocal behavior for children with autism (Seiverling, Pantelides, Ruiz&Sturmey, 2010),train special education teachers to conduct discrete-trial training(Sarokoff & Stormey, 2004), and teach safety skills such as gun-play prevention skills, abduction prevention skills, and sexual abuse prevention skills (e.g., Johnson, Miltenberger, Egemo-Helm, Jostad, Flessner, & Gatheridge, 2005; Miltenberger, Flessner, Gatheridge, Johnson, Setterlund, & Egemo, 2004).All studies resulted in the implementation of the interventions with high accuracy, indicating that BST is an effective instructional package for teaching numerous skills set to various individuals including parents and teachers.

To date, no study has examined the effectiveness of BST for training teachers to implement 3-step guided compliancewith children with autism in the special education environment. Furthermore, few studies have examined both the accuracyof implementation of BST and the effects on the corresponding child behavior. Therefore, the purpose of the current study was to extend Miles and Wilder's (2009) research to the special education setting, promoting correct implementation of 3-step guided compliance and increasing compliance rates of four school-aged students with autism. Additionally, the authors examined whether instructions plus corrective feedback were as effective in increasing compliance rates in children with autismas the combined BST package.

2. Method

2.1 Participants and Setting

Four elementary students and their special education teachers from one rural school district in the Southeastern United States participated in this study. Inclusion criteria for the children were as follows: (a) diagnosis of ASD, (b) teacher referral due to concerns with overall compliance, (c) compliance rates below 50% as measured by direct observations, (d) Functional Behavior Assessment (FBA) results demonstrating a function of escape/avoidance for noncompliant behavior, (e) prior behavioral interventions such as time-out and loss of privileges that had been determined to be ineffective for noncompliance, and (e) parent and teacher consented to participation. The first student-teacher dyad consisted of Mitch and his special education teacher. Mitch was a seven-year-old Hispanic male who attended a self-contained special education first-grade classroom for all academic instruction. He had been diagnosed with autism at the age of four. According to his teacher, Mitch had high rates of noncompliance and tantrum behavior (e.g., crying, flopping to the floor, hitting, and kicking) when academic demands were placed on him. His special education teacher was a Caucasian female in her early 30s. It was her first year teaching in a K-3 special education classroom. She received her special educator's license through an alternate route program and had little-to-no experience with working with children with ASD. Further, she indicated that she did not have intensive training in behavioral interventions or classroom management strategies. Her classroom consisted of six students with ASD or Developmental Delays (DD) and one full-time assistant teacher.

The second dyad consisted of Trevor and his special education teacher. Trevor was a four-year old Caucasian male who attended a Pre-K classroom for half a day. He had been diagnosed with autism at the age of three. By teacher report, he engaged in high rates of noncompliance when given a task. His special education teacher was a Caucasian female in her mid 50s who had more than 20 years of experience teaching children with special needs. Additionally, she had obtained a graduate degree in special education. Her classroom was comprised of six children between the ages of three and five and two full-time assistant teachers. All students in the classroom were diagnosed with DD, ASD, or Down Syndrome. According to self-report, the special educator had significant training in behavioral interventions and classroom management strategies through previous course work as well as continuing education credits and in-service trainings.

Savannah and her first-grade inclusion teacher made up the third dyad. Savannah was aseven-year-old African American female in afirst-grade inclusion setting. She attended 50% of the day in the regular education environment, while receiving remedial instruction during the remainder of the school day in a special education resource room. Savannah had been diagnosed with autism at the age of four. She was referred to participate in the study by her inclusion teacher due to high rates of noncompliance and tantrum behavior during classroom instruction and independent class work. Her inclusion teacher had three years of experience working in her current position. She was a Caucasian female in her late 20s who was enrolled in a Master's program in special education at the time of the study. By self-report, shehad previous exposure to trainings on behavioral interventions and classroom management strategies through her graduate school program. The inclusion teacher was appointed by the special education director to participate in the study due to her rapport with Savannah.

The last dyad consisted of Beth and her K-3 special education teacher. Beth was a six-year-old Caucasian female enrolled full-time in a self-contained special education classroom. She had been diagnosed with pervasive developmental disorder - not otherwise specified (PDD-NOS) at the age of four. Beth engaged in high rates of noncompliance and tantrum behavior when given an academic task. Her teacher was an African-American female in her late 40s who had ten or more years of experience working in the special education environment. She had received a graduate degree in special education and indicated intensive training on behavioral interventions and classroom management techniques. Her classroom consisted of seven children with a variety of disabilities including ASD, DD, Fetal Alcohol Syndrome, and mild to moderate intellectual disabilities. Two full-time teacher aides assisted her during the day.

Intervention procedures for three out of the four students were conducted in special education classrooms. Savannah was the only student who received interventions in the regular education setting. The intervention components were implemented by special education or inclusion teachers and supervised by a credentialed school psychologist or school psychologists-in-training.

Further, all experimenters had previously beeninstructed on relevant procedures and were required to demonstrate proficiency (i.e., meet a masterycriterion of 100% correct implementation on three consecutive trials) prior to implementing intervention andassessment procedures.

2.2 Data Collection and Dependent Measures

Data were collected by trained observers in the school setting during instructional time (i.e., reading, spelling, math, and circle time). Data collection procedures followed methods used in an earlier study by Miles and Wilder (2009). However, slight modifications were made to the number of trials per session and treatment implementation steps of the guided compliance procedure. Sessions in the current study consisted of 10 trials with the presentation of an academic task demand by the teacher in approximately 1 min intervals. 3-step guided compliance was used (i.e., verbal prompt followed by model prompt followed by physical prompt) contingent upon the child's noncompliant behavior. All participating teachers were instructed to first deliver a verbal prompt. Then, if the child did not comply within 10 sec, teachers were trained to repeat the verbal prompt while simultaneously modeling the correct response and then stating, "You do it." If the child did not comply within 10 sec, teachers then repeated the task demand verbally while simultaneously physically guiding (i.e., hand-over-hand) task completion. Contingent praise was delivered only during successful completion of the task followingthe verbal or model prompt.

The primarydependent measure was the percentage of the 12 steps of the 3-step guided compliance procedureimplementedcorrectly. The percentage of correct responses was calculated by dividing the total number of steps correctly implemented by the total number of correct plusincorrect responses for each trial, multiplied by 100. The mean percentage across the 10 trials was graphed as an overall session score.

The 12 steps required by teachers for implementation of the guided compliance intervention included: (a) requested and made eye contact with the child before presenting the demand; (b) called the child by name; (c) gave only one task demand at a time; (d) used calm, neutral tone of voice to deliver the demand; (e) used a demand, not a question, when delivering instruction; (f) used a specific/descriptive command; (g) used 'do' instead of 'don't' commands (i.e., directive commands); (h) waited 10 s for child to initiate responding; (i) praised if the child complied or repeated the demand using modeling(modeling included getting eye contact, performing the task, and then stating, "You do it"); (j) praised if the child complied or repeated the demand using physicalguidance for task completion; (k) recorded compliance data; and (l) waited at least 5 s to present another demand or interact with the child in some other way. Correct responses were coded if the teacher appropriately completed a step as outlined above. Incorrect responses were coded when the teacher implemented steps that varied from themethod mentioned above or if the teacher omitted a step. The secondary dependent measure was the children's percentage of compliance with the task demands. Compliance was coded only if the children followed through with or initiated the task demand followingthe verbal prompt (Miles & Wilder, 2009).

2.3 Procedural Integrity and Inter-observer Agreement

To assess procedural integrity, a second researcher observed 33% of the training sessions between researcher and teacher and independently coded correct implementation of BST training components by the researcher. Thesecomponents included: (a) providing verbal and graphic feedback of prior performance; (b) providing verbal instruction including all 12 guided compliance steps; (c) modeling the correct responses; (d) prompting the teacher to rehearse the correct responses; (e) providing feedback based upon rehearsal performance; (f) repeating the previous steps until the teacher demonstrated 100% correct implementation of the guided compliance steps during rehearsal. Procedural integrity was scored as a percentage of correctly implemented BST components. The percentage was calculated by dividingthe number of BSTcomponents presented by the number of components presented plus components omitted and then multiplying the result by 100. Procedural integrity was 100% across all observed sessions.

To assess inter-observer agreement (IOA), a second researcher observed 33% of baseline and treatment sessions and independently coded theteachers' implementation of the 12 guided compliance steps.The percentage agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying the result by100. The mean IOAfor all participants across phaseswas 93% (range, 86% to 100%).

3. Experimental Design and Procedures

A nonconcurrent multiple baseline design across teacher-child dyads was used to evaluate the effectiveness of the BST packageand the instructions plus corrective feedback component on teachers' implementation of 3-step guided compliance and children's compliance rates.

Baseline. Prior to each baseline session, the researcher instructed the teacher to deliver an academic task demand to the child. The demands were typically occurring instructions for the classroom setting (e.g., "Savannah, get out your reading book"). No specific guidelines were provided to teachers regarding the type of task, difficulty of demand, or prompting strategy. However, they were asked to provide approximately one task demand every 1 min during a 10 min session. Teacher and child behaviors were recorded for each session. The mean duration of baseline sessions was 7.8 min (range, 6.3 min to 12.7 min).

*Instruction plus corrective feedback.*The instruction plus corrective feedback condition closely resembled the consultation approach of school psychologists in the school setting. During this condition, the primary researcher provided each teacher with a written description of the 3-step guided compliance strategy, delineating the 12 steps used in the procedure. Immediately following review of the written document, teachers were given combined visual (i.e., integrity sheet) and verbal feedback on their baseline performance emphasizing the steps that were missed during baseline.Following feedback, teachers were then instructed to present academic demands to a child for a 10-min session. The initial training sessions lasted an average of 40 min (range, 28 min to 43 min).During all subsequent intervention sessions, visual and verbal feedback was provided to teachers based upon performance on the immediately preceding intervention session indicating steps implemented correctly and steps that needed reviewing. Following feedback, teachers were then instructed to present academic demands to child for a 10-min session.

None of the remaining feedback sessions lasted longer than 15 min (range, 11 min to 15 min). A graphical display of child compliance rates was also available to teachers during feedback sessions because child data were displayed on the same graph as teacher data. Child compliance rates and teacher implementation data were recorded simultaneously after the initial training sessions.

Behavioral Skills Training (BST). During the BST sessions, the researcher provided the same first two steps as outlined in the previous section (i.e., written instructions including the 12-steps of guided compliance and feedback regarding steps omitted during previous sessions). The researcher modeled the 12-step guided compliance procedure with a child for five trials. Next, teachers were asked to rehearse the 3-step guided compliance procedure with the researcher acting as the child. During rehearsal, teachers engaged in five trials with a child. Immediately after each rehearsal trial, verbal feedback was provided to teachers based upon their adherence to the treatment protocol. The researcher indicated which steps were successfully implemented and which steps had to be reviewed again. The modeling, rehearsal, and feedback components were repeated until the teacher reached 100% accuracy in the implementation of 3-step guided compliance across three consecutive 5-trial sessions. Initial training sessions lasted 51-min to 77-min. At the beginning of each subsequent session, teachers received brief verbal and graphical feedback on their performance during previous sessions. No other training was provided. Following feedback, teachers were then instructed to present academic demands to child for a 10-min session. Child data were collected in the same fashion as during the previous condition but data collection for the child participants did not begin and is not reflected graphically until after teachers had attained 100% accuracy of implementation of the guided compliance procedure.

Follow-up. Maintenance data were collected five weeks after termination of the BST sessions.During follow-up sessions, procedures were identical to thebaseline condition.Teachers were asked to provide approximately one task demand every 1 min during a 10-min session while both teacher and child behaviors were recorded.

4. Results and Discussion

Figure 1 depicts the percentage of correct teacher implementation of 3-step guided compliance and the corresponding percentage of student compliance rates across all the phases of the study. For all students, overall compliance rates increased in both intervention phases relative to baseline performance and were maintained during the five week follow-up. Highest compliance levels for all four students were observed during implementation of the BST package. Additionally, all special education teachers' implementation of 3-step guided compliance increased in both intervention phases relative to baseline levels and was also maintained during the five week follow-up, with percentage of correctly implemented steps being highest during the BST condition.

During baseline, data for Mitch and his teacher revealed low and relatively stable levels of child compliance and teacher implementation of 3-step guided compliance. Mitch was compliant with an average of 15.6% of task demands during baseline, while his teacher implemented guided compliance with an average of 21.2% accuracy. When the Instruction plus Feedback intervention was introduced for Mitch and his teacher, data revealed improvements in both teacher implementation of 3-step guided compliance and child compliance levels relative to baseline. During this condition, teacher implementation of 3-step guided compliance showed an immediate increase compared to baseline levels, and data remained stable throughout this phase. Mitch's teacher implemented the intervention with a mean accuracy of 41.6% while child compliance data were more variable throughout the intervention with an average of 30.6%. No changes in data were observed for the other participants with the implementation of the first intervention phase for Mitch.

During the BST package phase, the mean percentage of teacher implementation of guided complianceincreased to 68.2% and mean student compliance for Mitchincreased to 47.4%. It should be noted that Mitch was sick during session 17, leading to 0% compliance and relatively low levels of correct teacher implementation during that session. Immediately after recovering from the illness, the percentage of correct teacher implementation of the guided compliance procedure and child compliance increased to pre-illness levels. No change in data for the other participants was observed with the implementation of the BST package for Mitch.

During the five week follow-up for Mitch, both child and teacher data remained stable, with an average of 63.6% accurate teacher implementation of 3-step guided compliance and 59% child compliance. Overall, results for this student-teacher dyad indicated the highest percentages of compliance and intervention accuracy during the BST condition, with gains maintained at follow-up.

Trevor's baseline data indicated low and relatively stable levels of compliance with average child compliance of 15.7%. His teacher's average implementation accuracy of guided compliance was 34.6%. Following the implementation of Instruction plus Feedback, mean child compliance and teacher accuracy of implementation increased immediately to 42.5% and 59.7%, respectively. With introduction of the BST package, Trevor's compliance increased to a mean of 72.3%. During this condition, Trevor's teacher implemented the guided compliance procedure with an average of 90.9% integrity. These high levels of performance were somewhat maintained during the five week follow-up with stable data for both child and teacher. Trevor's mean compliance during follow-up was 61.7%, whereas accuracy of teacher implementation of 3-step guided compliance was 81.8%. Overall, data for this dyad indicated the highest percentages of compliance and intervention accuracy during the BST condition.

Savannah's and her teacher's baseline data were low, relatively stable, and with a decreasing trend toward the end of the baseline phase. On average, Savannah complied with task demands 20.9% of the time during baseline, while her teacher implemented the intervention with 35.7% mean accuracy. During the Instruction plus Feedback condition, the mean accuracy of teacher implementation of guided compliance was 55.8% and the mean percentage of child compliance was 42.4%. During BST, Savannah's teacher implemented 3-step guided compliance with a mean of 83.9% accuracy, while Savannah complied with a mean of 66.9% of task demands. Somewhat lower teacher accuracy of implementation was observed during the five week follow-up, with mean teacher implementation accuracy of 66.6%. However, child compliance was maintained at follow-up with an average of 68.1%. Overall, data for this dyad indicated the highest percentages of compliance and implementation accuracy during the BST condition.

Beth and her teacher also had low and stable baseline data with average child compliance of 16.3% and average teacher implementation accuracy of 15.6%.

With the introduction of the Instruction plus Feedback condition, an immediate increase in level and upward trend for child compliance data was observed (M = 49.5%), while teacher implementation of the intervention remained relatively stable with only slightly higher accuracy (M = 23.4%) when compared to baseline levels. During the BST condition, correct implementation of 3-step guided compliance and child compliance increased (M = 66.2% and M =70.4% respectively) relative to the previous condition. Data collected during the five week follow-up indicated moderate levels of correct implementation of guided compliance as well as child compliance (M = 45.5% and M = 59.9% respectively). It should be noted that Beth was the only student whose compliance rates, during all phases but baseline, were consistently higher than teacher accuracy of treatment implementation.

In summary, the greatest gains in child compliance and accurate implementation of the guided compliance were observed during the BST condition for all dyads.For all dyads except Beth and her teacher, increases in accurate implementation of guided compliance resulted in increases in student compliance. Additionally, moderate levels of accurate implementation and compliance were observed during the five week follow-up for all participantswith maintenance data remaining above baseline levels for all four dyads.

The results of the current study indicate that special education teachers, who have little to no training in implementation of behavior analytic strategies, can successfully be trained in a short amount of time to implement 3-step guided compliance in the school setting to reduce noncompliance in children with autism. Thus, the current findings support and extend previous research on BST and 3-step guided complianceby showing that the packed procedure is an effective and efficient way to train special education teachers while having a positive effect on child compliance.

Interestingly, anecdotal data suggested that teachers had a difficult time praising children for appropriate behavior and often failed to deliver clear and concise task demands.Additionally, Beth's teacher mentioned on several occasions that she did not think the intervention had the desired effects, which could have been the reason for relatively low accuracy in implementation of the 3-step guided compliance procedure.All other teachers reported a high degree of satisfaction with the intervention and stated that they would continue to use the intervention with other children when appropriate.

It is unclear why Beth responded fairly well to the intervention, given that her teacher was not satisfied with the strategy. Beth is the only student who displayed improvements in compliance when her teacher'scorrect implementation of the procedure remained low. One potential reason for the results could have been the previous training Beth's teacher had received, as she stated that she had extensive training in the field of classroom management and behavioral interventions. Although, no other intervention efforts were directly observed by the experimenters, data collection only occurred during a small time interval, and it is possible that Beth's teacher used other strategies when the observers were not in the classroom that may have affected Beth's compliance.

One limitation of the study is that variability in teacher experiences and previous training in behavior management was not controlled. Additionally, detailed information was not collected on prior training and experience. Whereas two teachers (i.e., dyad 1 and dyad 3), self-reported only limited training in behavioral interventions and classroom management of children with autism, the other two teachers reported extensive previous training and experiences in these areas. However, it should be noted that the data did not reflect differences in implementation of the intervention by teachers. Interestingly, the teacher in dyad 4, who had a master's degree in special education and self-reported extensive training on behavioral interventions and classroom management strategies, showed the greatest resistance to implementation of the intervention. Future studies should control for teacher experiences and previous trainings in order to determine their effects onthe implementation of 3-step guided compliance.

Another limitation of the study is the lack of a detailed component analysis for the BST packaged intervention. The current study evaluatedonly the combined strategies of Instruction plus Feedback and the packaged BST procedure. The selection of these two components was due to the time constraints during school consultation and the responsibilityof teachers to use evidence-based strategies in the schools to reduce problem behavior. Future research should address this issue and evaluate the BST components independently to identify which components are necessary for producing high levels of accuracy of implementation of the 3-step guided compliance procedure.

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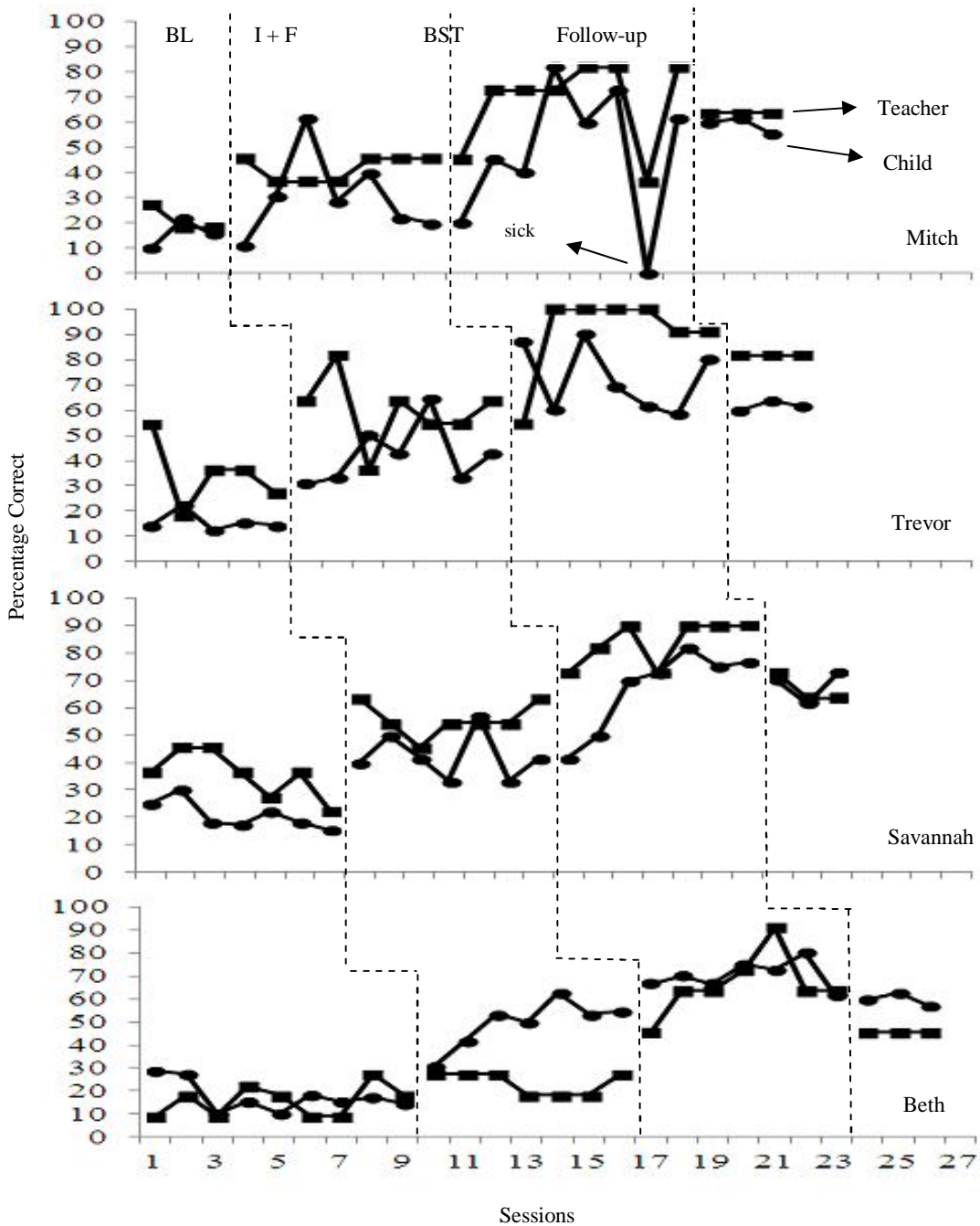
Figure 1: The Percentage of Correct Implementation of 3-Step Guided Compliance and the Corresponding Percentage of Student Compliance Across Baseline (BL), Instruction Plus Feedback (I+F), Behavioral Skills Training (BST), and a Five Week Follow-Up for Mitch, Trevor, Savannah, and Beth