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Pyramidal Training of an In-Home Skill Acquisition Program

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by

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Abstract

Time contratints can be a challenge for many clinicians when families have multiple support workers in their home providing service to their child. Clinicians typically run all trainings which can delay service as visits are not daily. By conducting training following behavior skills training (BST) and incorporating pyramidal training (train the trainer), parents can be taught to assume the primary role of trainer. In this study one mother was trained on how to implement a skill acquisition program with her child. The mother than took the role of trainer and trained three respite workers following BST to implement the same program. To test for social validity the mother completed a self-efficacy questionnaire. Results of the study demonstrated that parents can be taught to be effective behavior change agents and assume the role of trainer effectively.

DESCRIPTORS: pyramidal training, behavior skills training, self-efficacy

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Chapter 1: Introduction

Parental involvement in their child's behavior programming is a key element to how successfully a newly acquired skill will be generalized and maintained in a variety of settings. Generalization and maintenance require the frequent practice of skills across multiple environments and people (Dogan, King, Fischetti, Lake, Mathews, & Warzak, 2017). Parents have the most opportunities to practice skills and engage in teaching with their child, and training parents how to implement behavior change programs can positively impact the overall durability of the acquired skill (Dogan et al., 2017). A well-researched training model is behavior skills training (BST). BST involves four steps: providing instructions on how to complete a skill, modeling the skill, allowing the individual to rehearse the skill, and providing praise or corrective feedback on each step of the skill rehearsed. These steps are used to help teach an individual to perform certain behaviors under specific conditions (Miltenberger, 2008). BST has proven to be an effective approach when teaching parents a variety of skills and has been shown to teach novel skills in a short period of time (Nigro-Bruzzi & Sturmey, 2010).

Although an effective teaching model, BST often is implemented to teach a single caregiver in the home. In many home environments, there may be multiple caregivers as well as in-home workers who support the child. This could pose a strain on time and resources if the clinician involved is needed to train each individual in the child's immediate environment. Pyramidal training (or "train-the-trainer"), which refers to training one person to implement a behavior program and then teaching them to train others (Kuhn, Lerman, & Vorndran, 2003), may be an effective approach in decreasing training time required by a clinician. In a study conducted by Parsons, Rollyson, and Reid (2013), they used the pyramidal training model in

conjunction with BST to train ten participants who worked in an adult education setting for individuals with severe intellectual disabilities and autism. The participants were trained to use BST to train other staff to implement a four-step teaching procedure and a brief preference assessment. Training was provided in a group format with two instructors, and group sizes were three to four people. Results of the study showed that each participant improved their implementation of BST and were able to effectively and accurately train another staff. By using pyramidal training and BST, they were able to save clinician time and maintain effective teaching.

Implementing pyramidal training and BST with parents could lead to improved parental self-efficacy. As defined by Bandura in 1977, self-efficacy refers to one's perception of his or her ability to accomplish a task or reach a set goal (Erford & Gavin, 2012). Feldman and Werner (2002) evaluated the collateral effect of behavioral parent training (BPT) on families with children with problem behaviors and a developmental disability. BPT consisted of a behavior consultant providing training to families one to two hours per week for three to six months. The authors compared 18 families who received BPT to 18 families with similar behavioral concerns who were not receiving service. They found that parents who received BPT rated themselves significantly higher as effective behavior-change agents (a measure of self-efficacy) than the parents who did not receive training. Although the pyramidal model was not used in this study, it does demonstrate that training parents using BST-like package can lead to greater confidence in program implementation.

Neef (1995) extended this research to group training; she evaluated two parent-training models with 26 parents who had children diagnosed with autism. Fourteen parents were assigned

to the peer parent training, wherein parents were trained and then trained other parents; the remaining 12 parents were assigned to the standard parent training, in which all parents were trained directly by a professional. In both training groups parents were taught how to implement a skill acquisition program that they had identified as a priority (e.g., coin identification, telling time, number recognition). Results showed that both training groups' performance on training tasks increased substantially from baseline levels. It also demonstrated that in each training group gains were maintained well above baseline during follow-up. This study supports that parents can be taught to be effective trainers when implementing instructional strategies.

Adubato, Adams, and Budd (1981) examined the feasibility of training one parent to implement programs and to train the other parent in the same program implementation. A mother was trained on how to teach her son how to get dressed. Once the skill was acquired, she then trained her husband on the same program with no feedback from the clinician. Once dressing was taught, they then took data to see if the parents were able to generalize the skill, they had learned to target an eating and leisure goals with their son. The results of the study indicated that the mother was able to learn the skills during training and effectively train her husband to implement the same skills. Following parental implementation of the program, the child's behavior also improved. Some generalization was demonstrated when looking at eating and toy use. At a two-year follow-up parents were reported to still implement the strategies and felt that they were better able to teach new skills.

The practicality of using one family member to train other family members in an attempt to save cost and time was investigated in a study conducted by Kuhn, Lerman, and Vorndran (2003). They trained three primary caregivers to implement individualized strategies to treat

problem behavior. Once the primary caregiver was taught how to accurately implement the strategies, they then trained two other family members to implement the same strategies. The results of the study indicated that the three primary caregivers were trained to effectively train other family members to implement behavior management strategies. This study supports pyramidal training as an effective way for family members to assume the role of a primary trainer.

One benefit of pyramidal BST training for parents that has not been addressed in the literature is the impact on maintenance of programming and behavior change. If parents are not trained adequately to implement their child's programs, or if the parents are unable to train new in-home staff, gains made in treatment may not be maintained, leading to re-referral for clinical services. The purpose of the present study is to replicate prior pyramidal training by parents, as well as to test for generalization to novel skills, and to train a caregiver to teach and implement a generalized program. The study involved training one mother to implement an independent activity schedule with her child, then having the mother teach the program to her child's three respite workers. The family in this study has received clinical services for over four years; however, each time the child was discharged he was soon re-referred for services. The study aims to examine the impact of being trained as a trainer and teaching others to successfully implement behavioral programming on the mother's reported confidence in program implementation, her success in transferring the training to novel skills with her child, and the need for continued or repeated clinical consultation.

Chapter 2: General Method Method

Participants

The primary participant ("trainer") was a 46-year-old single mother with a high-school education. The independent activity schedule (IAS) was implemented with her 15-year-old son ("client"), who has a diagnosis of autism and obsessive-compulsive disorder (OCD). He was vocal and able to follow a variety of complex instructions. He could read and write at a fifth-grade level. Additional participants ("trainees") were three respite workers supporting the child in the home.

Setting and Materials

All training sessions took place inside the client's home. Baseline and intervention sessions were conducted in the living room, which contained a coffee table, three stools, one couch, and one side table with a variety of activities that the client engaged with. The materials for the IAS included a variety of books; single-digit addition, printing, and time-telling worksheets; a pencil; an eraser; a Zoob Builder set; a 24-piece interlocking puzzle; and the client's iPad. Magazines were placed on the dining room table for the participants to look through while the client completed his IAS. Tasks were selected based on skills that were already in the client's repertoire. A blank sheet of paper was used to write down the activities the client was required to complete during the IAS. Data sheets to track (a) implementation of the IAS by the trainer, trainees, and (b) client responses to each step of the IAS were also present.

Experimental Design

A multiple baseline across participants was used to evaluate the treatment effects of BST and pyramidal training.

Dependent variables and data collection. During the initial phase of the study the researcher trained the trainer how to implement IAS, and the dependent variable was the percentage of steps completed correctly. Data were collected using a preset data sheet and pen. In the second phase of the study the trainer taught the trainees how to run IAS. The dependent variables were the number of BST steps followed by the trainer and the percentage of IAS steps completed correctly by the trainees. The percentage of IAS steps completed correctly by the client was also measured. A correct response by the client was defined as the client completing the task without asking for help or requiring redirection to the task. An incorrect response was defined as the client requiring verbal or gestural redirection, or completing the incorrect response for the instruction given.

All data were collected using paper and pencil (see Appendix A for sample data sheets) and graphed as percentage of correct steps implemented. Correct implementation of the IAS by the trainer and trainees was considered mastered following three consecutive implementations of IAS with 100% integrity. To evaluate self-efficacy following the intervention, the trainer completed a survey (see Appendix B).

IOA and procedural integrity. A research assistant collected interobserver agreement (IOA) in 100% of all the sessions for each of the participants. Each step of the IAS was scored as an exact agreement or a disagreement between the two observers. Procedural integrity was calculated as correctly implementing each of the components of the IAS. The agreements for

both IOA and procedural integrity was totaled and then divided by the sum of agreements and disagreements and multiplied by 100. During each session with each participant, IOA and procedural integrity was 100%.

Chapter 3: Procedure

Independent Activity Schedule (IAS)

A variety of activities as listed above were placed on the side table in the living room. The trainer (or trainee) held up two activities for the client to choose from. Participants were informed by the researcher or trainer to vary the activities held during each choice to ensure the same activity was not chosen twice. If the client rejected an item during the first presentation, it was then paired with another item during the next selection. All activities presented in this study were probed with the client prior to training beginning with the trainer and trainees, to ensure they continued to be mastered targets. The client was able to complete all tasks with no prompting. The chosen activities were written on a piece of paper for the client to follow. This was repeated until the client had selected three activities. The client completed each activity and placed a checkmark beside the activity once completed. Once all the activities had been completed, he walked into the dining room or kitchen where the caregiver was and vocally stated "I'm done" or a variant and he was given his iPad. The dining room and kitchen were adjacent to the living room, allowing participants to observe the client complete the IAS and collect data.

Baseline

The trainer and trainees were given a written task analysis of the IAS and verbally instructed to run the program with the client. No other information was provided to the participants. The researcher and research assistant collected data on what steps of the IAS were completed correctly or incorrectly. Baseline data were collected once per week for each participant until training commenced.

Training the trainer. The researcher used BST to train the trainer how to implement the IAS with the client. The first step of BST is to provide participants with *instructions* on how the program is run. A written copy of the task analysis was provided to the trainer, and the researcher verbally reviewed each step and answered any questions the trainer had.

The second step of BST is for the researcher to *model* for the trainer how to implement the steps listed in the IAS. The researcher first modeled how to run the IAS when the client completed all the activities without walking away or asking for help. The researcher and trainer sat in the living room and the researcher said "time to complete your schedule". The researcher chose two activities from the side table, held them up and said "pick one". The trainer, assuming the role of the client, chose an activity, the researcher then placed the activity on the table and wrote the activity on the sheet of paper. This was completed again for another two activities, each time offering different activities for the trainer to pick from. Next, the researcher wrote "tell mommy when I'm done" on the sheet of paper and then wrote "iPad". The researcher verbally reviewed the schedule with the trainer and then said "do your activities" and walked to the dining room and began to read a magazine. The trainer then walked over to the researcher and said "I'm done". The researcher said "great work, here is your iPad" and handed the iPad to the trainer. The researcher than modelled what to do should the client ask for help during the IAS. The trainer walked up to the researcher sitting in the dining room and said "I need help", the researcher said "you can do it; remember, first activities, then iPad" and pointed to the living room where the activities were. Lastly, the researcher modeled what to do if the client walked away from the activities. The trainer walked away from the living room into the hallway, the

researcher got up and stood in front of the trainer and said “remember, first activities, then iPad; go back” and pointed to the living room.

The third step in BST is *rehearsal.* Following the modeling phase, the trainer role-played the steps with the researcher, and the researcher assumed the role of the client. The trainer first role-played what to do when the client followed all the steps of the IAS, then when the client asked for help, and when the client walked away. Step four in BST is *feedback*. The researcher provided the trainer with verbal feedback on the steps she implemented correctly and the steps requiring further practice. All feedback was provided after each step and not once the entire role play was completed. The trainer was required to score 100% across three rehearsal sessions for the trainer to reach mastery criteria.

Once mastery criteria were met, the trainer ran the IAS will the client. The trainer was required to receive a score of 100% when implementing the IAS with the client before training the trainees on how to implement the program. Following the initial training session with the trainer, all other training sessions began with a rehearsal probe. The researcher asked the trainer to demonstrate how to run the IAS. If the trainer scored 100% the training session ended. If she did not score 100%, the training session resumed.

Training trainees. In this condition, the trainer taught each trainee individually to implement the IAS, following the same BST model and procedure used to train the trainer. The trainer provided the first trainee with the written task analysis used in the baseline and vocally reviewed each step and explained what was involved, as well as answered any questions the trainee had. Next, the trainer modeled how to run the IAS using total task presentation, and the trainee assumed the role of the client. Following the modeling step, the trainee then rehearsed

the steps of the IAS by role playing with the trainer. The trainer provided the trainee with verbal feedback on the steps they implemented correctly and the steps requiring further rehearsal. The modeling, rehearsal, and feedback steps were implemented until the trainee completed all the steps of the IAS correctly. Once the trainee met the mastery criteria of 100% across three rehearsal sessions, they then ran the IAS with the client. The trainer then trained the second trainee following the above steps. Once the second trainee met mastery criteria, the trainer taught the third trainee how to implement the IAS. The researcher did not provide the trainer with feedback during training unless criteria had been met for a booster training session (see below). Probe data were also taken at the beginning of each training session with each trainee following the initial training. If the trainees scored 100% the training session ended; if they scored less than 100% the training session resumed.

Booster training. Had the trainer scored less than 80% on a treatment adherence check, or had she requested booster training, a single booster session would have been provided using the same procedure as in the initial training (Marcus, Swanson, & Vollmer 2001). However, no booster training sessions were required throughout this study.

Self-efficacy survey. To test for social validity, a questionnaire was given to the trainer to complete following the intervention. Four questions were included that required the trainer to self-report her readiness to train others following the training (see Appendix B).

Chapter 4: Results

The accuracy of the trainer implementing the IAS can be found in Figure 1. During baseline, the trainer implemented IAS with 68% accuracy. Following the intervention, the trainer then implemented IAS with 100% accuracy across three sessions. During the fifth session the trainer ran IAS with the client with 100% accuracy, and the client completed all steps of the IAS correctly. Only the initial training was required as the trainer probed out of the remaining two training sessions.

The trainees' accuracy implementing IAS following training by the trainer can be found in Figure 2. For the first trainee, three baseline data sessions were conducted all with 43% accuracy. Following intervention, the trainee completed the first training session with 80% accuracy, the second training session with 100% accuracy and then probed out of the remaining two training sessions. When implementing IAS with the client, they did so by following all steps with 100% accuracy and the client completed all the steps in IAS correctly. Eight baseline sessions were conducted with the second trainee, each with a score of 50%. Following intervention, the trainee conducted IAS with 100% accuracy and then probed out of the remaining two training sessions. When running IAS with the client the trainee did so with 100% accuracy and the client completed all the steps of IAS correctly. Eleven baseline data sessions were conducted with the third trainee, all with 56% accuracy. Following intervention, the trainee conducted IAS with 100% accuracy and probed out of the remaining two training sessions. When running IAS with the client the trainee did so with 100% accuracy and the client completed all steps of the IAS correctly.

Self-Efficacy Survey

The trainer completed the parental questionnaire and responded ‘yes’ to each question. The trainer reported that she found the training process to be easy to follow, found the rehearsal phase the most important, and felt better prepared to train staff in future with different programs, without having to rely solely on the clinician to provide training to staff.

Chapter 5: Discussion

This study replicated and extended prior research on pyramidal training for parents (e.g., Adubato et al., 1981; Kuhn et al., 2003). We successfully trained a mother to implement an IAS, and then to teach three respite workers how to implement the program with the client. The results of this study contribute to the literature in several ways. This study adds to the literature on how the pyramidal training format using BST can be an effective training model with parents, as the client's mother demonstrated the ability to train three respite workers following the skills she was taught by the researcher. Pyramidal training saved clinician time and did not delay implementation of treatment plans. Had the clinician been the sole trainer, only one session every two weeks would have been the feasible training schedule, delaying the implementation of the IAS by months. With the client's mother taking the role as trainer, this program was effectively taught to the mother, and three respite workers in four weeks. The client in the study had multiple workers within the home; the training taught his mother how to assume the role of trainer and improved self-efficacy as reported in the survey completed by the client's mother. With the client's mother taking the role as trainer, she reported being prepared to now train workers to implement future programs. The treatment plan was a simple and cost-effective procedure to implement, as it did not require additional resources outside of what the family already used. The terminal goal of IAS is to include self-care tasks as well as chores. As the client is able to complete daily life skills with minimal assistance, it will require less support from caregivers, improving his quality of life, as some of his most private tasks, such as bathing and dressing will no longer require a caregiver. This can only benefit him when the time comes for him to transition to a residential setting with multiple staff and residents. By teaching the

client's mother how to increase her child's independence, it will only benefit the family as a whole, as less scheduling of workers and less meetings will be required, allowing the mother to gain back time within their day to tend to regular family events, such as attending the extra-curricular events of her other children and social outings with friends. By decreasing staff support, it will also benefit the family financially, and they are able to regain their privacy.

There are some limitations that should be addressed. BST itself is a treatment package with multiple components; it is unclear if all, some, or one of the steps in the training model were responsible for the change in behavior. Anecdotally, the mother reported that rehearsing the steps of the plan is what she found to be the most helpful. This is in contrast to the results of a component analysis of BST by Drifke, Tiger, and Wierzba (2017), which found that the full BST package was required for parents to meet mastery level of performance. Ward-Horner & Sturmey (2012) found feedback to be the most effective for improving teacher performance of conducting a functional analysis. The survey in the current study was only completed by the trainer and not the trainees, so it is possible that their responses would have more closely matched prior research.

Generalization to other programs was not probed due to family scheduling. Future research should include generalization to other activities within the IAS, as well as other skill acquisition programs and safety plans.

The mother in the study has many years of experience implementing behavioral programs and has worked directly with the researcher in this study for three years, and as such developed a rapport and good working relationship. It is unknown if the results of this study would have been effective, had the mother not had any previous experience with such programs.

Lastly, the self-efficacy questionnaire included yes and no responses. It is unknown if a Likert scale or open-ended questions would have evoked different responses.

This study supports prior findings that the use of BST in pyramidal training for parents is an effective training model (Adubato et al., 1981; Kuhn et al., 2003), as one trainer was able to train multiple trainees. It also supports the notion that parents can be taught to be effective program trainers and implementers, improving reported self-confidence, and becoming effective behavior change agents for their children.

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Appendix A: Figures

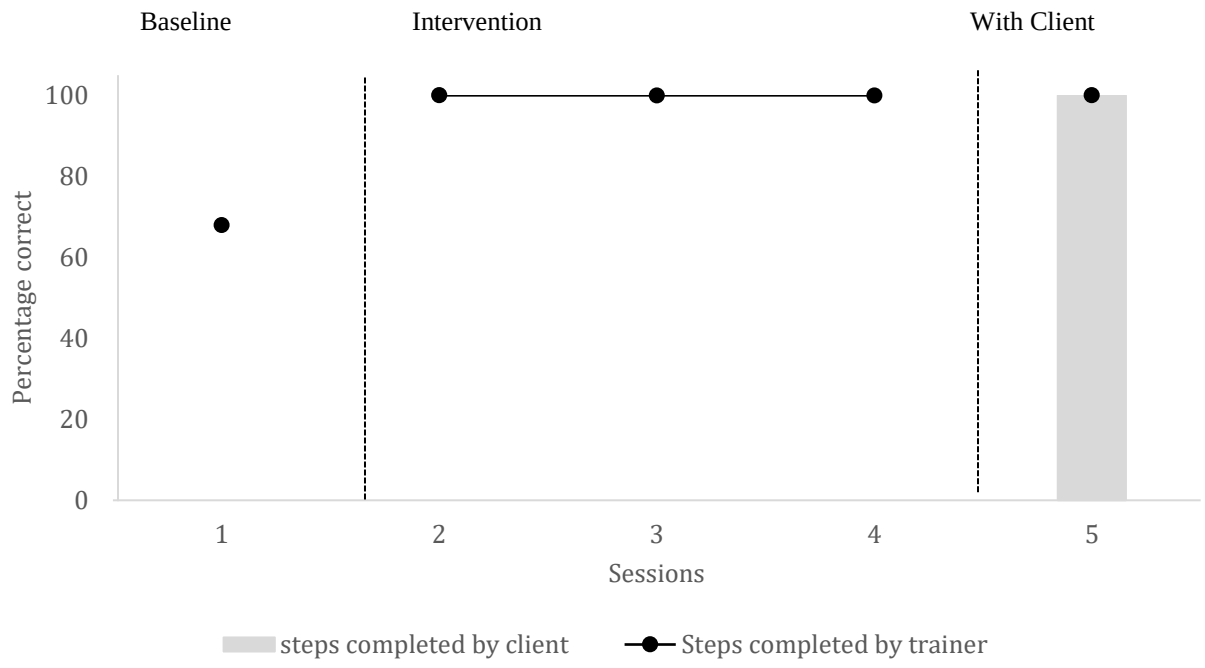

Figure 1. Percentage of correct implementation of IAS by trainer.

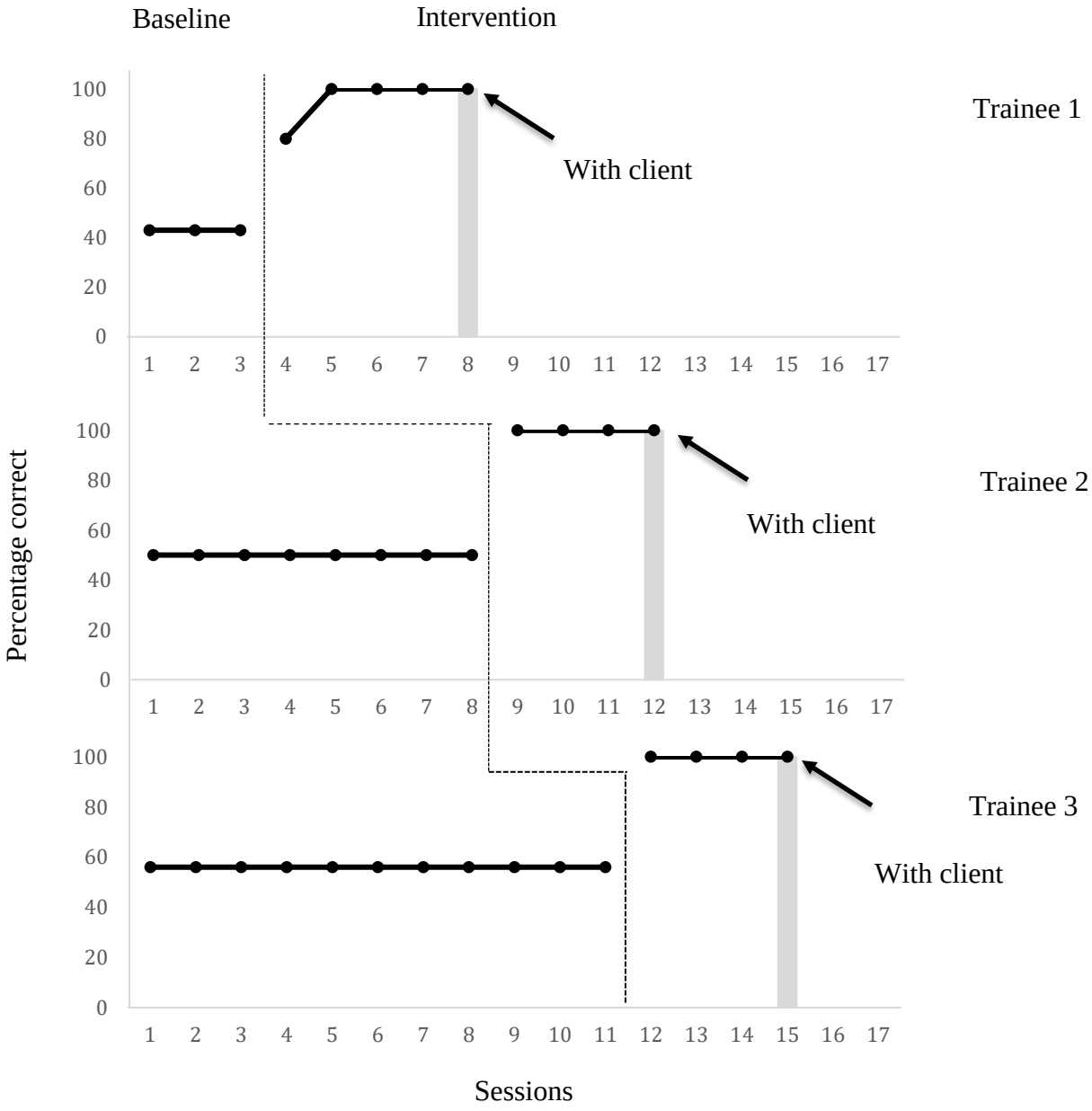

*Figure2.*Percentage of correct implementation of IAS, first trainee (top graph), second trainee (middle graph), third trainee (bottom graph).

Appendix B: Data Sheets

BST Data Sheet:

Instructions: This data sheet will be used to record what steps the primary trainer used when training the trainees.

Circle the following when applicable:
+= completed the step accurately
-= completed the step incorrectly
O= step missed

Trainee Name:

BST Steps	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:
1. Instructions	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o
2. Model	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o
3. Rehearsal	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o
4. Feedback	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o	+ - o

IAS Data Sheet
Instructions: This data sheet will be used to track the steps implemented by staff.

Circle the following when applicable:
+= completed the step accurately
-= did not complete the step accurately
o= did not complete the step

Steps:	Date: Staff: Phase:	Date: Staff: Phase:	Date: Staff: Phase:	Date: Staff: Phase:	Date: Staff: Phase:
1. Grab sheet of paper and pen					
2. Tell client it is time to complete the schedule					
3. Hold up two items and have the client choose an activity					
4. Place activity on the table					
5. Write the activity of the sheet					
6. Hold up a different set of two items and have the client choose an activity					
7. Place the activity on the table					
8. Write the activity on the sheet					
9. Hold up a different set of two items and have the client choose an activity					
10. Place the item on the table					
11. Write the activity on the sheet					
12. Write down “tell (mom/staff) when you are done”					
13. Write down “then iPad”					
14. Review the schedule with the client					
15. Say to the client “do your schedule”					
16. Walk away out of client’s sight					
17. If client asks for help, remind him “first schedule then iPad”					
18. Point to the area where the activities are located					
19. If client walks away from activities, walk up to client and say “remember first activities then iPad”					
20. Point to the area where the activities are located					

Appendix C: Parental Self-Efficacy Questionnaire

Instructions: Please circle yes or no to each question below.

1) The training provided by the clinician was thorough and easy to understand

   Yes or No

2) Following the training I believe I have the necessary skills to train others

   Yes or No

3) I believe using the same training model to train others to implement a different program would be effective

   Yes or No

4) I feel more prepared to teach skills to my son and his team

   Yes or No