

LOOKING FOR QUANTITATIVE AND QUALITATIVE MEASURES OF TEACHING
INTERACTIONS: A PRELIMINARY ANALYSIS

Jade Weir

Thesis Prepared for the Degree of
MASTER OF SCIENCE

UNIVERSITY OF NORTH TEXAS

May 2019

APPROVED:

Shahla Ala'i-Rosales, Committee Chair

Justin Leaf, Committee Member

Joseph Cihon, Committee Member

Jesus Rosales-Ruiz, Committee Member and
Chair of the Department of Behavior
Analysis

Neale Chumbler, Dean of the College of Health
and Public Service

Victor Prybutok, Dean of the Toulouse Graduate
School

Weir, Jade. *Looking for Quantitative and Qualitative Measures of Teaching Interactions: A Preliminary Analysis*. Master of Science (Behavior Analysis), May 2019, 59 pp., 20 tables, 3 figures, 5 appendices, references, 39 titles.

Indicators of quality early intensive behavioral intervention (EIBI) include comprehensive interventions, adequately trained staff, high rates of effective instruction delivery, happy interactions between children and their teachers, and socially valid outcomes. When these are in place, high quality EIBI is more likely to increase progress that children with autism make during treatment. When not in place, progress is not as likely, as rapid, or as meaningful. To date, there is limited research regarding the correlation between these indicators of high-quality EIBI and the degree to which their effects are meaningful to direct consumers. The purpose of this methodological study was to compare direct, quantitative measures of teaching interactions (child initiations, teacher initiations, child affect, teacher affect) with qualitative measures (stakeholder ratings of teacher effectiveness, amount of opportunities for interaction and interest in the child) of teaching interactions to determine what sets the occasion for expert stakeholders to describe a teaching interaction as effective, quality therapy.

Copyright 2019

by

Jade Weir

ACKNOWLEDGEMENTS

First, I would like to thank the members of my committee – Dr. Shahla Ala’i-Rosales, Dr. Jesus Rosales-Ruiz, Dr. Justin Leaf, and Joseph Cihon. Your patience, commitment and advice during this process is greatly appreciated. I have learned many things from you all that I will carry with me in both professional and personal endeavors from here on out. I would like to thank Emerald Allen, Kyle Caldwell, Anna Dotson, Kevin Marchini and Evan Schliefer-Katz for their help with IOA/edits and continued friendship. I am indebted to my supervisors, friends and colleagues at Easter Seals North Texas (Aria Dean, Rachael White, Dalai Hines, Lindsey Lambert, April Linden and Isabel Cunningham) who made it so easy to go to work every day. I am incredibly grateful to have made life-long friends in Elizabeth Sansing and Terra Cliett, who I would not have made it through graduate school without. Thank you to Chloe Reynolds and Erin Mutz for sticking by me through this process. Finally, I would like to express my sincere gratitude to my family for their continued love, support and encouragement to follow my dreams – no matter where they take me.

TABLE OF CONTENTS

| | Page |
|---|------|
| ACKNOWLEDGEMENTS | iii |
| LIST OF TABLES | v |
| LIST OF FIGURES | vi |
| INTRODUCTION | 1 |
| METHOD | 6 |
| Participants and Setting..... | 6 |
| Materials | 6 |
| Inclusion Criteria | 7 |
| Exclusion Criteria | 8 |
| Measures and Data Collection | 8 |
| Interobserver Agreement | 12 |
| RESULTS | 14 |
| DISCUSSION | 20 |
| APPENDIX A. DATASHEET | 43 |
| APPENDIX B. OBSERVATION CODE | 45 |
| APPENDIX C. SOCIAL VALIDITY SURVEY | 50 |
| APPENDIX D. DESCRIPTIONS OF VIDEOS | 52 |
| APPENDIX E. INTEROBSERVER AGREEMENT (IOA) QUIZ..... | 55 |
| REFERENCES | 57 |

LIST OF TABLES

| | Page |
|--|------|
| Table 1. Participant Credentials and Years of Experience | 26 |
| Table 2. Inclusion and Exclusion Criteria..... | 26 |
| Table 3. Responses to Open-Ended Questions (Clip 1)..... | 28 |
| Table 4. Responses to Open-Ended Questions (Clip 1)..... | 28 |
| Table 5. Responses to Open-Ended Questions (Clip 1)..... | 29 |
| Table 6. Responses to Open-Ended Questions (Clip 2)..... | 30 |
| Table 7. Responses to Open-Ended Questions (Clip 2)..... | 31 |
| Table 8. Responses to Open-Ended Questions (Clip 2)..... | 32 |
| Table 9. Responses to Open-Ended Questions (Clip 3)..... | 33 |
| Table 10. Responses to Open-Ended Questions (Clip 3)..... | 34 |
| Table 11. Responses to Open-Ended Questions (Clip 3)..... | 34 |
| Table 12. Responses to Open-Ended Questions (Clip 4)..... | 35 |
| Table 13. Responses to Open-Ended Questions (Clip 4)..... | 36 |
| Table 14. Responses to Open-Ended Questions (Clip 4)..... | 37 |
| Table 15. Responses to Open-Ended Questions (Clip 5)..... | 38 |
| Table 16. Responses to Open-Ended Questions (Clip 5)..... | 38 |
| Table 17. Responses to Open-Ended Questions (Clip 5)..... | 39 |
| Table 18. Responses to Open-Ended Questions (Clip 6)..... | 40 |
| Table 19. Responses to Open-Ended Questions (Clip 6)..... | 41 |
| Table 20. Responses to Open-Ended Questions (Clip 6)..... | 41 |

LIST OF FIGURES

| | Page |
|--|------|
| Figure 1. Comparison of social validity questions and quantitative measures. | 23 |
| Figure 2. Comparison of social validity questions and quantitative measures (Clip 1-3). | 24 |
| Figure 3. Comparison of social validity questions and quantitative measures (Clip 4-6). | 25 |

INTRODUCTION

Autism spectrum disorder (ASD) is a developmental disorder characterized by impairments in social communication and interaction in the presence of restricted or repetitive behaviors or interests (American Psychiatric Association, 2013). Individuals who receive a diagnosis of autism have varying levels of deficits in play, cognitive functioning, social interactions, and adaptive functioning (American Psychiatric Association, 2013). According to estimates from the Centers for Disease Control (CDC), about 1 in 68 children has been diagnosed with ASD, with greater prevalence for males than females.

Early intensive behavioral intervention (EIBI) is based on the principles of applied behavior analysis and has been documented as an evidence-based, comprehensive treatment that produces lifelong meaningful changes for children diagnosed with ASD (Reichow, 2012). EIBI is most effective when implemented 25-40 hr per week and includes intensive 1:1 or group intervention consisting of treatments aimed to increase language development, self-help skills, academics, and leisure and play skills (Howard, 2005). Empirical results of the effects of EIBI were first published by Lovaas (1987), indicating that 47% of children with autism who received EIBI achieved optimal outcomes relative to those who did not. Additionally, those children who received EIBI scored within a normal range on standardized intelligence tests and were placed in a general education classroom without assistance. There have been many extension and replication studies since the publication of the Lovaas (1987) study (McEachin, Smith, & Lovaas, 1993; Cohen, Amerine-Dickens, & Smith, 2006; Harris, Handleman, 1991; Smith, Groen, & Wynn, 2000) and several reviews (Eldevik et al, 2009; Rogers, 2008; Eldevik et al, 2010) that have reached similar conclusions regarding the effectiveness of EIBI. This research

has shown us that there are several ways to maximize the effectiveness of EIBI for children with autism.

Firstly, intervention should be comprehensive in nature – targeting a wide range of skills and deficits such as language development (e.g., Sundberg, 2008; Koegel, O’Dell, and Koegel, 1987), the development of social behaviors (e.g., Leaf, et al, 2012a), leisure and play skills (e.g., Koegel et al., 2005; Oppenheim-Leaf et al., 2012) and academics (e.g., Browder, Spooner, Ahlgrim-Delzell, Harris & Wakemanxya, 2008). Secondly, teachers should deliver instructions effectively. According to Greer (1999), effective instruction includes the presentation of frequent and relevant consequences based on the child’s responding. These interlocking operants of instructions are referred to as learn units (Greer, 1999). The learn unit is a measure of the reciprocal relationship between the behavior of a teacher and the behavior of a student, which is an important direct measure because it captures the behaviors of both the student and the teacher as they relate to one another. The greater and faster the number of learning opportunities that the student is presented with, the more progress that the child is likely to make (Carnine & Fink, 1978; Ingham & Greer, 1992). Learn units are observable in an assortment of settings, such as pre-school classrooms, group lectures and one-to-one instruction. This allows for the learn unit to either be planned or created incidentally with a variety of learners (Greer 1999). In a comparison study conducted by Howard (2005), children received either intensive behavior analytic treatment or an eclectic approach. The eclectic approach consisted of treatments that are often found in public school settings, and includes a combination of TEACHH-based procedures, sensory integration therapy and discrete trial teaching. Intensive treatment consisted of 25-30 hrs per week of 1:1 intervention (via discrete trials, incidental teaching and several other behavior analytic approaches to treatment). Results from this study showed that the children in the

intensive group who made the most gains had 50-100 learning opportunities per hour. Thirdly, treatment should be implemented with a high level of fidelity to ensure that teachers can successfully implement behavior analytic procedures after training (Ledford & Wolery, 2013). Allen and Warzak (2000) noted that successful interventions are dependent on basic effectiveness of the procedures as well as their precise delivery by the caregiver to ensure consistent implementation and therefore, maximum progress. Although there are a few measures of treatment fidelity available to practitioners (Weinkauf, Zeug, Anderson, Ala'i-Rosales, 2011), there is also substantial evidence that children learn more efficiently and with better retention when interventionists are appropriately trained (e.g., Ala'i-Rosales, Thorsidottir, & Etzel, 2003; Downs, Downs, & Rau, 2008; Weinkauf, Zeug, Anderson, & Ala'i-Rosales, 2011).

According to Wolf (1978), developing systems to measure social importance of interventions is key to ensure that the pursuit of the science of behavior is socially relevant. To do this, researchers must consider the social significance of their goals, the social appropriateness of procedures, and the social importance of the effects of scientific research. Recent research has highlighted the importance of a happy environment in which the student can make un-coerced initiations that lead to natural social consequences over time (see, for example, Ala'i-Rosales, Toussaint & McGee, 2017). Therefore, it is important to consider what constitutes a happy environment. In a study conducted by Koegel (1996), parents were trained using two different training paradigms to “assess whether different parent training interventions might differentially influence parents global style of interactions with their children” (p. 349). The results of this study indicated that before training occurred, parent-child interactions were characterized as neutral – the parent and child did not appear interested in one another and did not seem either decidedly happy or unhappy. After the intervention took place, the parent-child

interactions were characterized as positive – the child and parent are smiling, they seem interested in one another and appear relaxed. While the teacher is an important participant in reciprocal interactions with students, there are limited published data that focus on teacher behavior in the context of EIBI (Symes 2006). A study conducted by Hurt and colleagues (2013) attempted to identify personality factors that were key to hiring teachers for such a demanding job in the field of behavior analysis. The results of their analysis showed that extraversion (i.e., referring to friendliness, gregariousness, excitement seeking, cheerfulness, and assertiveness), agreeableness (i.e., referring to compassion, morality, trust, sympathy, cooperation, and modesty) and conscientiousness (i.e., referring to an individual’s degree of persistence, motivation, orderliness, and self-discipline) were all rated as positive personality factors for teachers working with individuals with developmental disabilities. While these researchers speak of these as personality traits, at the same time, the observable behaviors suggested that the affect and overall happiness of children and their teachers influences the quality of intervention. A final parameter to effective EIBI is the degree to which the effects of intervention are socially valid. To determine this, researchers must consider the social significance of their goals, the social appropriateness of procedures, and the social importance of the effects of scientific research. One way this can be done is by asking a group of indirect consumers’ questions about their satisfaction with the relevance and importance of the goals of the behavior change program (Baer, Wolf, Risley 1987; Schwartz & Baer 1991). According to Schwartz and Baer (1991), “...sound social validity assessments consist of asking “the right questions, to the right people, at the right time” (p. 195), and so great care should be taken when deciding which members of the community (either immediate or extended) to ask about the validity and acceptability of a program. Schwartz and Baer (1991) also suggest that “asking expert judges to compare

photographed or videotaped” (p. 195) behavior samples is a method that has emerged recently (i.e., since the initial discussion of social validity by Baer, Wolf, Risley in 1987) that allows for the rating of a wider range of observable behavior while still asking the same questions you would ask if assessing subjective measures of behavior. According to Hawkins (1991), “the validity of such consumer judgements has yet to be established” (p. 212) and therefore the results should be interpreted with caution. However, the goal still stands that behavioral interventions will have socially important treatment effects and will include socially acceptable treatments (Carr, 1999) to maximize the gains that children can make during EIBI.

In summary, indicators of quality EIBI include comprehensive interventions, adequately trained staff, high rates of effective instruction delivery, happy interactions between children and their teachers, and socially valid outcomes. With these parameters in place, high quality EIBI can positively impact the gains that children with autism make during treatment. When these parameters are not in place, these gains are not as likely, as rapid, or as meaningful. To date, there is limited research regarding the correlation between these indicators of high-quality EIBI and the degree to which their effects are meaningful to direct consumers. The purpose of this methodological study was to compare direct, quantitative measures of teaching interactions (child initiations, teacher initiations, child affect, teacher affect) with qualitative measures (stakeholder ratings of teacher effectiveness, amount of opportunities for interaction and interest in the child) of teaching interactions to determine what sets the occasion for expert stakeholders to describe a teaching interaction as effective, quality therapy.

METHOD

Participants and Setting

Ten staff members at a university-affiliated, non-profit organization that provides behavior analytic services for children diagnosed with autism completed the social validity survey. These staff members had varying levels of education and experience providing interventions based on the principles of applied behavior analysis (ABA) to children with autism. Information regarding the participants, their credentials, and years of experience can be found in Table 1. Eight of the staff members held bachelor's degrees in applied behavior analysis and one to five years of experience working with children with ASD ($M=3$). Four of these staff members had obtained their Registered Behavior Technician (RBT) certification within the last year. The remaining two staff members were master's level Board Certified Behavior Analysts (BCBAs) and provided supervision and training to staff (including the eight staff members with bachelor's degrees) at the non-profit organization. The master's level BCBAs had provided behavioral intervention for children diagnosed with autism for five to 10 years ($M=7$). All the individuals who completed the social validity questionnaire received didactic training in applied behavior analytic techniques from the organization, as well as direct supervision while working with children diagnosed with autism.

Materials

The researcher scored videos of footage of interactions between children diagnosed with autism and their interventionists. Video clips were selected from the Autism Navigator website (Autism Navigator, 2017). Autism Navigator is a collection of online tools such as videos, courses, and how-to guides that attempts to bridge the gap between effective evidence-based

practices, parents and service providers' understanding of autism, and the science of effective therapy (Autism Navigator, 2017). Specifically, the ASD video glossary was developed as a free resource of more than 100 video clips. The glossary is divided into two sections: diagnostic features and treatment. The diagnostic section contains videos that highlight the diagnostic features of ASD in contrast with behaviors that are observed with typically-developing children, whereas the treatment section includes video clips showing some commonly used interventions for children with autism, such as behavioral interventions and developmental interventions, structured teaching and supports, clinical therapies, and toddler treatment models (Autism Navigator, 2017).

The researcher contacted Autism Navigator and received permission to view and share the videos from the glossary prior to the beginning of the study. There were 30 videos available on the video glossary. Six videos from a variety of approaches to behavioral intervention were included in the study based on inclusion and exclusion criteria. There were several videos that met the inclusion criteria, but were not included in the study. The reason for this is that the six videos chosen showed the greatest range in both qualitative and quantitative measures. A list of videos and the inclusion criteria that they met can be found in Table 2.

Inclusion Criteria

To meet criteria for inclusion in the study, the treatment model represented in the video had to have empirical support that supported the use of the technique presented (e.g., Discrete Trial Teaching, Lovaas Model, Picture Exchange Communication System (PECS), Pivotal Response Training (PRT), Positive Behavior Support (PBS), Verbal Behavior). A second criterion for inclusion was clear audio and visual presentations (i.e., clear, non-grainy images,

loud and clear audio) which allowed for measures to be scored accurately from a video clip. To meet the criterion for clear audio and visual presentations, the child and interventionist had to be in the camera frame during each interval, which allowed for clear views of the primary measures. The third criterion for inclusion was that the video clip was at least three minutes long. The first three minutes of each of the six video clips were included in this study to provide a reasonable amount of time to a) capture enough of the measures required for analysis and b) ask the members of the social validity group to watch and score.

Exclusion Criteria

A video was excluded from this study if it did not have empirical support, if it was not at least three minutes in length, or if it had poor audio and visual presentation (i.e., unclear, grainy images, quiet and muffled audio, student and interventionist cannot be seen in camera frame during every interval). Videos that contained interactions between parents or siblings were also excluded from this study.

Measures and Data Collection

The measures were child initiations to teacher, teacher initiations to child, child affect, teacher affect, teaching interactions, and a social validity survey. Data was entered using a data sheet in Microsoft Excel (2016) (see Appendix A). The full observation code contains additional examples of the primary measures (see Appendix B).

Child initiations were defined as any time the child made a bid for attention from the teacher which included, but was not limited to, requests (e.g., asking for help, asking for a toy/activity, asking the teacher a question), comments (e.g., talking about things that were

happening during play, their favorite toys, or about their work), eye contact (e.g., looking at the teacher), and gestures (e.g., pointing at people or toys). This excluded anytime the child oriented his/her body towards the teacher but did not initiate a bid for attention. *Child initiations* were scored using 10-second partial interval recording. For example, there might be a scenario in which a teacher and child are playing with a deflated balloon. The child may look at the teacher and giggle while the teacher blows air into the balloon. This would be scored as a *child initiation* because the child made eye contact with the teacher to gain his attention.

A *teacher initiation* was scored when the teacher made a bid for attention from the child which included, but was not limited to, requests (e.g., asking the child to complete a task, asking the child a question), comments (e.g., talking about things that were happening during play, talking about pictures in a book, talking about the child's work), eye contact (e.g., looking at the child), and gestures (e.g., pointing at people or toys). This excluded anytime the teacher oriented his/her body towards the child but did not initiate a bid for attention. *Teacher initiations* were scored using 10-second partial interval recording. An example of a *teacher initiation* could involve the teacher and child playing with a balloon. After pumping the balloon up with air, the teacher releases the balloon and the two watch the balloon jet across the room. Once the balloon lands on the floor, the teacher raises his eyebrows, looks at the child and says, "That was fun! Shall we do it again?" This would be scored as a *teacher initiation* because the teacher made eye contact with the child and asked him/her a question to get his/her attention without the child making an initiation first. Child and teacher initiations can also be scored during a discrete trial teaching episode. For example, a child and teacher are reading a book together and the teacher says to the child, "Point to the apples," and then the child points to the apples and the teacher

smiles while saying “Wow, nice job listening!” This would be scored as a *teacher initiation* because the teacher initiated an interaction with the child by giving an instruction.

Child positive affect and *teacher positive affect* were defined as any visible or audible indicators of happiness and enjoyment (e.g., laughing, smiling, and physical affection). *Child positive affect* and *Teacher positive affect* were scored using 10-second partial interval recording. For example, the child giggling while the teacher blew up the deflated balloon would be scored as *child positive affect*. When the teacher raised his eyebrows, and said, “That was fun! Shall we do it again?” that would be scored as *teacher positive affect*. The child smiling while making a comment about the book he/she is reading with the teacher would be scored as *child positive affect*, and the teacher smiling and delivering praise to the child for responding correctly would be scored as *teacher positive affect*.

A *teaching interaction* was defined as a reciprocal interaction involving several discrete responses from the child and teacher. A teaching interaction began when the teacher provided an opportunity for the child to respond (e.g., the teacher asked the child a question, or gave the child an instruction). The child is then given a short period of time to respond. The accuracy of the response was determined based on the consequence provided by the teacher such as, but not limited to, praise, a tangible item, corrective feedback, and/or a prompt. For example, if the teacher said, “That’s right,” the child’s response was scored as correct; however, if the teacher said, “No, that’s not it,” the child’s response was scored as incorrect. A teaching interaction ended when the child no longer consumed or engaged with the reinforcer, or when the teacher presented an opportunity for a new teaching interaction. For example, a teaching interaction occurs when the child and teacher are sitting across from each other at a table that contains toy animals. The teacher says to the child, “Show me that you are ready to work,” and the child puts

her hands in her lap. This is scored as the beginning of the teaching interaction. The teacher then says, “Nice listening!”, and the child smiles at the teacher, concluding the teaching interaction. This is an example of a teaching interaction within a discrete trial format, but these teaching interactions can also occur in a naturalistic teaching format. As in the examples listed above, a teaching interaction would begin when the teacher holds a deflated balloon and looks to the child with raised eyebrows while saying “Shall we do it again?” The child says “Yes! Blow up the balloon!” and the teacher delivers a consequence (i.e., blowing up the balloon and releasing it) while the child chases the balloon around the room and smiles (i.e., consumption of the reinforcer).

The social validity survey (see Appendix C) included a total of 14 questions, three of which were open-ended and 11 were answered using a 3-point Likert scale. The open-ended questions were constructed to gather information about how the staff members would describe the style of teaching modeled in the video, whether staff members would hire the teachers from the video clips and their rationales for these answers, while also describing specific skills they would train to increase effectiveness (see Tables 3-20). The questions with a Likert scale focused around themes of happiness, quality of intervention, teaching opportunities, and the balance of initiations between the child and therapist, much like the primary measures that were scored during the study. Participants’ response options varied per question, with possible answers being very/agree/excellent, somewhat/neutral/moderate, or no/disagree/not enough.

The ten staff members participating in the social validity survey watched the first 3 min of the six video clips in a group format. The researcher introduced each video clip by reading a brief description of the video as described on the Autism Navigator Video Glossary website (see Appendix D). After each video, the staff members were given as much time as necessary to

individually complete a survey. The next video clip was shown after the entire group finished the survey.

Interobserver Agreement

The researcher and a research assistant independently scored the video clips to assess reliability. Prior to initial scoring, the research assistant was trained on the data collection system for each of the measured variables. The training began with a review and discussion of the observation code, following which the research assistant was required to reach mastery on a quiz (see Appendix E) with a variety of true/false and fill-in-the-blank questions to assess their understanding of the observation code. If the assistant scored 80% or above on the quiz, the researcher and the research assistant scored one video clip together. If mastery criterion for the quiz was not met, the researcher and the research assistant would review and discuss the code again, and the research assistant would re-take the quiz. This would continue until the mastery criterion was met. Once the assistant scored 80% or above on the quiz the researcher and the research assistant scored one video clip together, stopping at the end of every 10-second interval to discuss and compare their scoring. If the mastery criterion was met, the research assistant then scored one video clip on their own until achieving 80% IOA or higher across all measures. If mastery criterion was not met, the researcher provided feedback as to why a measure should or should not have been scored based on the observation code. For example, if there was an interval during which the researcher scored a child initiation but the research assistant did not, the two watched the interval again together, and the researcher pointed out to the research assistant the occurrence of the behavior that they were scoring. The research assistant then continued to watch the video by herself. After meeting the mastery criteria for independent scoring, the research

assistant scored 33% of the video clips for all five primary dependent measures. IOA was calculated by dividing the number of agreements (i.e., intervals where the researcher and research assistant agreed on the occurrence or nonoccurrence of a measure) by the total number of agreements plus disagreement (i.e., intervals where the researcher and research assistant did not agree on the occurrence or nonoccurrence of a measure) and multiplying by 100. Mean percentage of agreements for child initiations was 97% (range, 94 to 100%). Mean percentage of agreements for teacher initiations was 97% (range, 94 to 100%). Mean percentage of agreements for child affect was 97% (range, 94 to 100%). Mean percentage of agreements for teacher affect was 97% (range 94 to 100%). Mean percentage of agreements for teaching interactions was 93% (range, 92 to 94%).

RESULTS

Figure 1 displays the results of the quantitative measures and qualitative measures averaged across all video clips. The top panel of Figure 1 displays measures scored from direct observations of video clips (i.e., child initiations, teacher initiations, child affect, teacher affect and teaching interactions). The middle panel of Figure 1 displays the ratings of teaching effectiveness scored from the social validity survey (i.e., engagement, balance of interests, teaching opportunities and teaching effectiveness). The bottom panel of Figure 1 displays the ratings of quality of teaching scored from the social validity survey (i.e., child happiness, teacher happiness, and child and teacher interest in one another). The panels correspond with one another to create a visual representation of the comparison between the ratings from the social validity and the results from the direct observations. Along the Y-axis on the top panel is percentage of 10-second intervals, and across the X-axis on the top panel is happy affect. The C represents child and the T represents teacher. For example, the dark bar labeled C represents the percentage of 10-second intervals where the child displayed happy affect during Clip 1. The dark bar with labeled T represents the percentage of 10-second intervals where the teacher displayed happy affect during Clip 1. These direct measures correspond with the middle and bottom panel; where the Y-axes represent the rating scored on the social validity survey regarding engagement, child happiness and teacher happiness, respectively. During Clip 1, the child displayed a positive affect during 88% of the intervals, and the teacher displayed a positive affect during 94% of the intervals. Regarding the same Clip, the results from the social validity show that the respondents believed the child and teacher to be very engaged with one another, as well as very happy to be around each other. As a contrasting example, Clip 4 is represented on the top panel by the bars with vertical grey stripes. The child displayed positive affect during 5% of the intervals, and the

teacher displayed positive affect during 38% of the intervals. The middle panel shows that the respondents on the social validity survey did not believe that the child and teacher were engaged with one another, and did not believe that the child and teacher were happy to be around each other.

Figures 2 and 3 display the results of the quantitative measures and the qualitative measures across all clips. The top panels of Figure 2 display the social validity results and primary measures for Clip 1, the middle panels display the results for Clip 2, and the bottom panels display the results for Clip 3. The results are displayed similarly for Clips 4, 5, and 6 in Figure 3.

Each of the ten questions from the social validity survey are represented along the X-axis. Question 1 asks if the teacher is happy and Question 2 asks if the child is happy. Question 3 asks if the child and teacher are interested in one another and Question 4 asks if the child and teacher are interested in the activity. Question 5 asks if the child and teacher are mutually engaged together with an activity. These questions correlate with the primary measure of child and teacher affect. Question 6 asks if the respondent feels that there is a balance of initiations between the child and teacher, and Question 7 asks if there is a balance of responses between the child and teacher. These questions correlate with the primary measure of child and teacher initiations. Questions 8,9, and 10 ask if the teacher created an appropriate amount of teaching opportunities, if the teacher has an effective teaching session, and if the teacher is arranging the environment and delivering access to reinforcing items/activities, respectively. These questions correlate with the primary quantitative measure of teaching interactions.

The top panel of Figure 2 shows a comparison between the results of the social validity questionnaire and the percentage of 10-second intervals where direct measures were recorded for

Clip 1. Overall, respondents agreed on all social validity questions. There was a slight disagreement on Questions 2 through 6, as well as Question 9. The most disagreements were on Questions 4 and 6. On Question 4, seven respondents agreed that the child and teacher were interested in the activity, but three respondents only somewhat agreed. On Question 6, seven respondents agreed that there was a balance of initiations between the child and teacher, but three respondents only somewhat agreed. With respect to the quantitative measures, 20% of the intervals contained child initiations, 90% of the intervals contained teacher initiations, 90% of the intervals contained child affect, 95% of the intervals contained teacher affect, and 80% of the intervals contained teaching interactions. Overall, the quantitative measures did align with the qualitative measures obtained by the respondents on the social validity questionnaire.

The middle panel of Figure 2 shows a comparison between the results of the social validity questionnaire and the percentage of 10-second intervals where direct measures were recorded for clip 2. Overall, the respondents did not agree on social validity Questions 4 through 7, as well as Questions 9 and 10. The most disagreements were on Questions 6 and 7. On question six, one respondent agreed that there is a balance of child and teacher initiations, but seven respondents only somewhat agreed and two respondents did not agree. On Question 7, six respondents agreed that there was a balance of responses between the child and teacher, but three respondents only somewhat agreed and one respondent did not agree that there was a balance of responses between the child and teacher. With respect to the quantitative measures, 0% of the intervals contained child initiations, 100% of the intervals contained teacher initiations, 90% of the intervals contained child affect, 80% of the intervals contained teacher affect, and 90% of the intervals contained teaching interactions. Overall, the quantitative measures did align with the qualitative measures obtained by the respondents on the social validity questionnaire.

The bottom panel of Figure 2 shows a comparison between the results of the social validity questionnaire and the percentage of 10-second intervals where direct measures were recorded for clip 3. Overall, there were disagreements on Questions 2 through 10, with the most disagreements on Questions 4 and 6. On Question 4, two respondents agreed that the child and teacher are interested in one another, but eight respondents only somewhat agree. On Question 6, seven respondents agreed that there was a balance of initiations between the child and teacher, but two respondents only somewhat agree and one respondent did not agree that there was a balance. With respect to the quantitative measures, 60% of the intervals contained child initiations, 55% of the intervals contained teacher initiations, 70% of the intervals contained child affect, 60% of the intervals contained teacher affect, and 80% of the intervals contained teaching interactions. Overall, the quantitative measures did align with the qualitative measures obtained by the respondents on the social validity questionnaire.

The top panel of Figure 3 shows a comparison between the results of the social validity questionnaire and the percentage of 10-second intervals where direct measures were recorded for clip 4. Overall, there were disagreements across all 10 questions on the social validity questionnaire, particularly on Questions 3 and 7. On Question 3, one respondent agreed that the child and teacher were interested in one another but five respondents only somewhat agreed and two respondents did not agree. On Question 7, two respondents agreed that there was a balance of responses, but three respondents only somewhat agreed and five respondents did not agree that there was a balance of responses. With respect to the quantitative measures, 95% of intervals contained teacher initiations, 0% of intervals contained child affect, 40% of intervals contained teacher affect, and 40% of intervals contained teaching interactions. Therefore, the quantitative

measures did align with the qualitative measures obtained by the respondents on the social validity questionnaire.

The middle panel of Figure 3 shows a comparison between the results of the social validity questionnaire and the percentage of 10-second intervals where direct measures were recorded for clip 5. Overall, there were disagreements across all 10 questions, with most notable differences in Questions 1 and 5. On Question 1, two respondents agreed that the teacher was happy, whereas five respondents only somewhat agree and three respondents did not agree that the teacher was happy. On Question 5, one participant agreed that the child and teacher were mutually engaged with one another, but five respondents only somewhat agreed and four respondents disagreed that the child and teacher were mutually engaged with one another. With respect to the quantitative measures, 42% of the intervals contained child initiations, 100% of the intervals contained teacher initiations, 57% of the intervals contained child affect, 100% of the intervals contained teacher affect, and 65% of the intervals contained teaching interactions. Overall, the quantitative measures align with the qualitative measures obtained by the respondents on the social validity questionnaire, except for question one because even though the respondents did not agree that the teacher was happy, 100% of the intervals contained teacher affect.

The bottom panel of Figure 3 shows a comparison between the results of the social validity questionnaire and the percentage of 10-second intervals where direct measures were recorded for clip 6. Overall, there were disagreements across Questions 2, 3, and 8. The most disagreement was on Question 8, where four respondents agreed that the teacher created an appropriate amount of teaching opportunities, five respondents only somewhat agreed that there was an appropriate amount of teaching opportunities, and one respondent disagreed that there

was an appropriate amount of teaching opportunities. The results of the quantitative measures show that 5% of intervals contained child initiations, 100% of intervals contained teacher initiations, 22% of intervals contained child affect, 20% of intervals contained teacher affect and 100% of intervals contained teaching opportunities. In the case of clip 6, the quantitative measures align with the qualitative measures for all questions except question eight.

DISCUSSION

The current study compared quantitative measures of teaching interactions with qualitative measures of teaching interactions to determine what sets the occasion for expert stakeholders to describe a teaching interaction as effective, quality therapy. This was done by having professionals rate the videos through a social validity survey, scoring those same videos using a battery of objective measures, and conducting a comparison between the two.

Overall, when there was a low percentage of intervals with child initiations, respondents were more likely to agree that the child and teacher were interested in one another. The exception to this was on clip two, where there were 0% of intervals containing child initiations, but all respondents agreed that they were interested in one another. A possible explanation for this could be that even while the child looked engaged and happy, the teacher led most of the interaction which might have limited the child's opportunity to make initiations. This is corroborated with the social validity survey, because seven respondents only somewhat agreed that there was a balance of responding during the interaction. When the video clips had moderate to low levels of teacher initiations, respondents were more likely to score "somewhat agree" when asked "is the teacher happy?" even though the respondents still agreed that there was an effective number of teaching opportunities and that the teacher had an effective teaching session. A possible explanation for this could be that there was still a balance of initiations between the child and teacher, and that the teacher was still arranging the environment and delivering access to reinforcing items/activities. When the video clips had moderate to low levels of child affect (i.e., Clip 4), respondents were more likely to only somewhat agree that the child was happy, interested in the activity, and mutually engaged with the teacher. The results are also similar for teacher affect (i.e., Clip 6), which suggests that even if teachers are presenting ample

opportunities for a child to learn, if they do not appear to be enjoying the interaction, then professionals will not agree that their teaching sessions are effective. When the video clips had moderate to low levels of teaching interactions, respondents were more likely to disagree that the teaching session was effective. These results suggest that creating appropriate amounts of opportunities for the child to learn is an important component of quality intervention.

While the comparison between the qualitative and quantitative measures are apparent, there are still several limitations to the current study that are worth noting. First, the social validity participants were all members of the same research lab where the study was conducted, as well as all working at the university-affiliated organization where the research lab group discussed the mission of their work weekly. The homogeneity of the respondents could have affected the outcomes of the social validity questionnaire. It is possible that a more diverse sample of respondents would have yielded different results, which would be a valuable comparison to address in future research. However, this is also the strength of the current study, as it allows for an agency to develop their mission and improve the quality of their therapy based on markers that are valuable to them. Another limitation of the current study stems from the selection of the clips for inclusion. Several other clips in addition to those included met our initial inclusion criteria, but only six clips were selected based on variables outside of the inclusion criteria such as lab group discussions of opinions of quality intervention based on clinical experience. Therefore, there is a strong potential for a selection bias for the videos. However, the videos included in the present analysis were selected to provide a wide variety of interactions for the comparison. Future studies may wish to include all videos that meet inclusion criteria, as well as including a larger variety of video clips from other video databases. Future investigations may also wish to develop a battery of qualitative measures from the parent

perspective, in order to determine whether the same measures that are important to clinicians, researchers or other expert stakeholders are similar or different to a parent opinion of effective therapy.

Certain parameters should be in place for children to make the most gains possible during Early Intensive Behavioral Intervention. EIBI should include comprehensive interventions, high rates of effective instruction delivery, happy interactions between children and their teachers, and socially valid outcomes. While further research is needed to determine exactly which measures are paramount, and how those measures interact with one another to create a gold standard of evidence-based, high-quality behavioral intervention, the validation of qualitative measures of social validity (as seen in the social validity survey) with quantifiable behaviors allows for a preliminary analysis of effective, quality therapy in relation to the opinion of expert stakeholders.

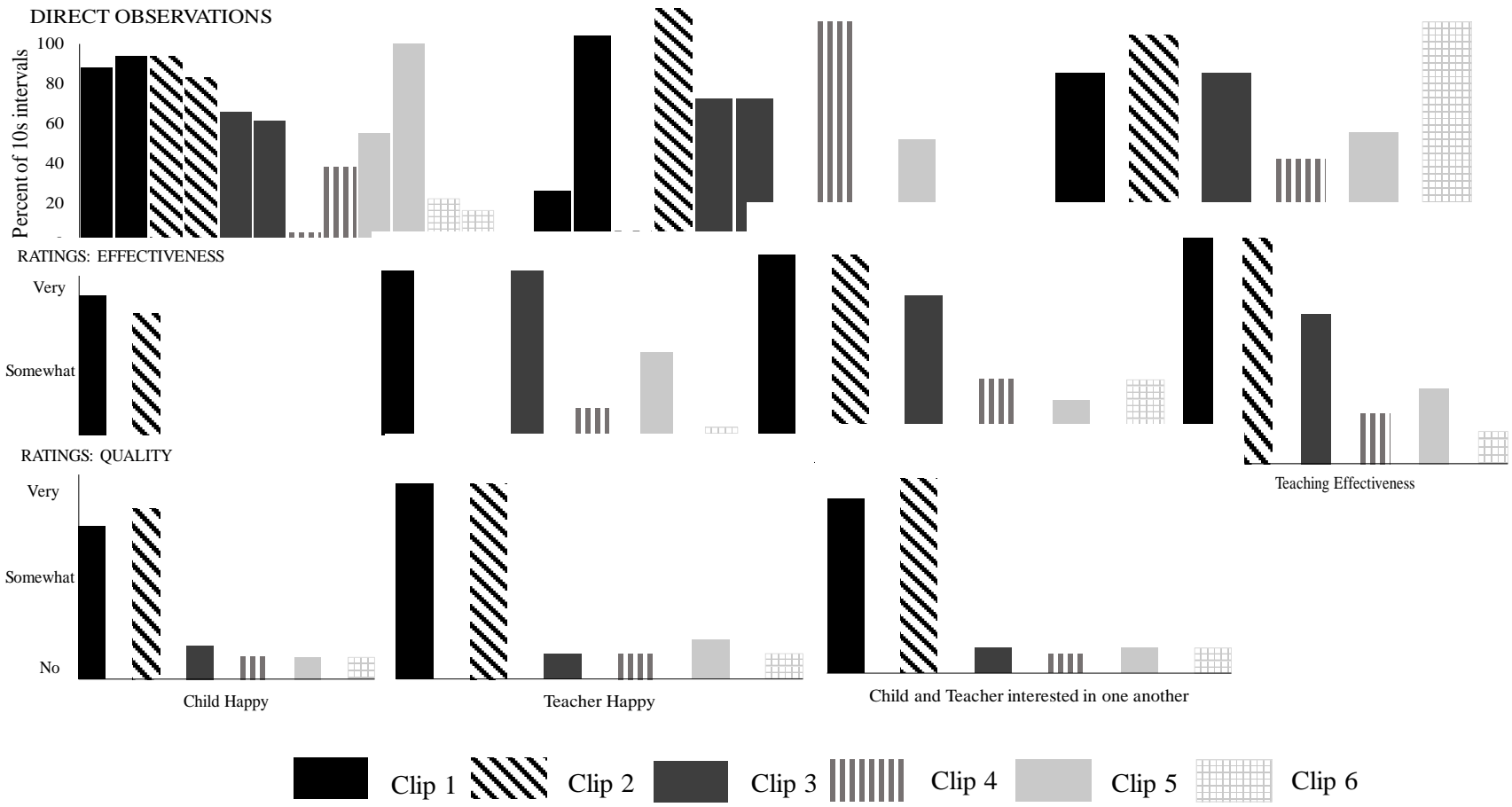


Figure 1. Comparison of social validity questions and quantitative measures.

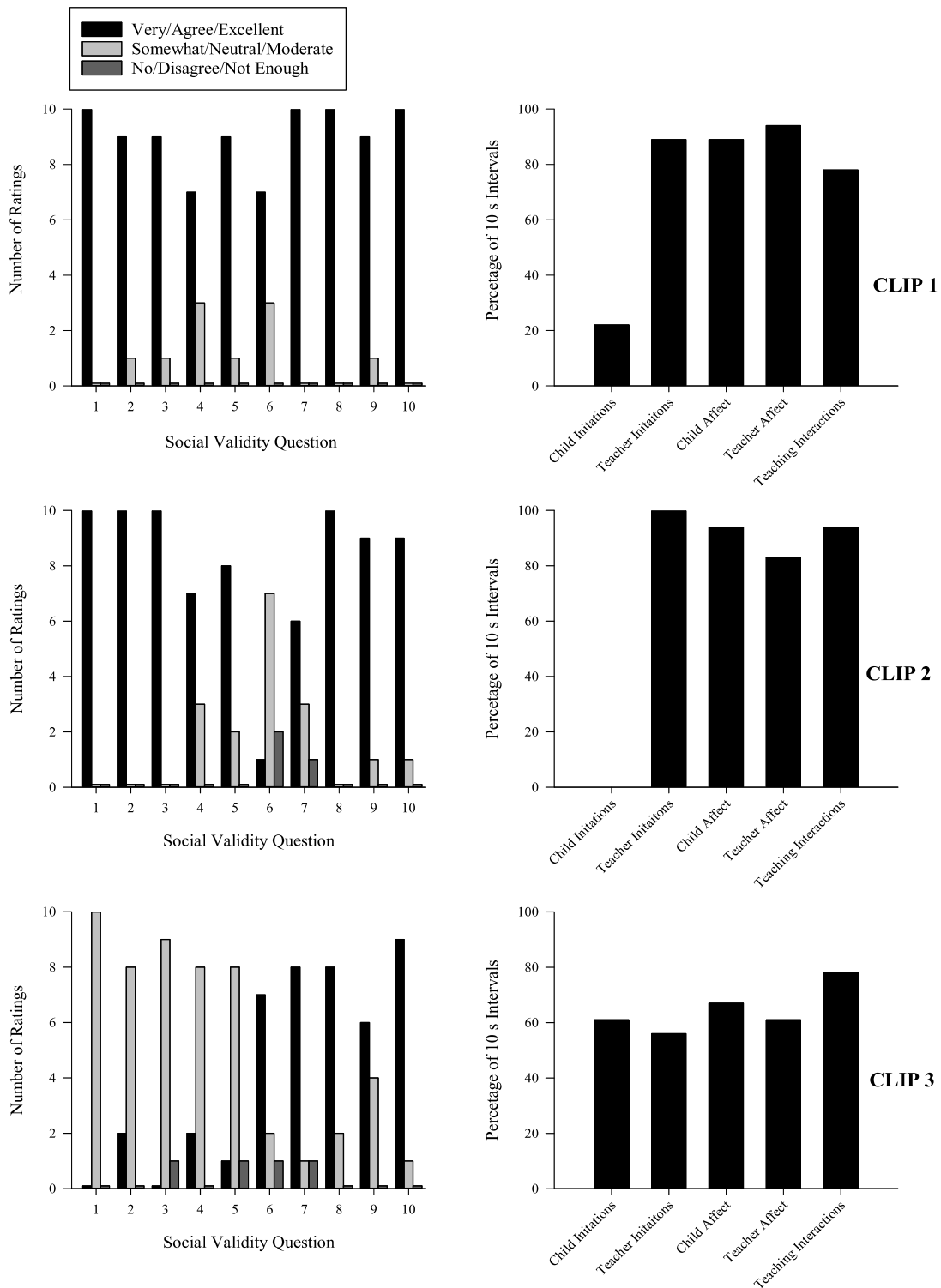


Figure 2. Comparison of social validity questions and quantitative measures (Clip 1-3).

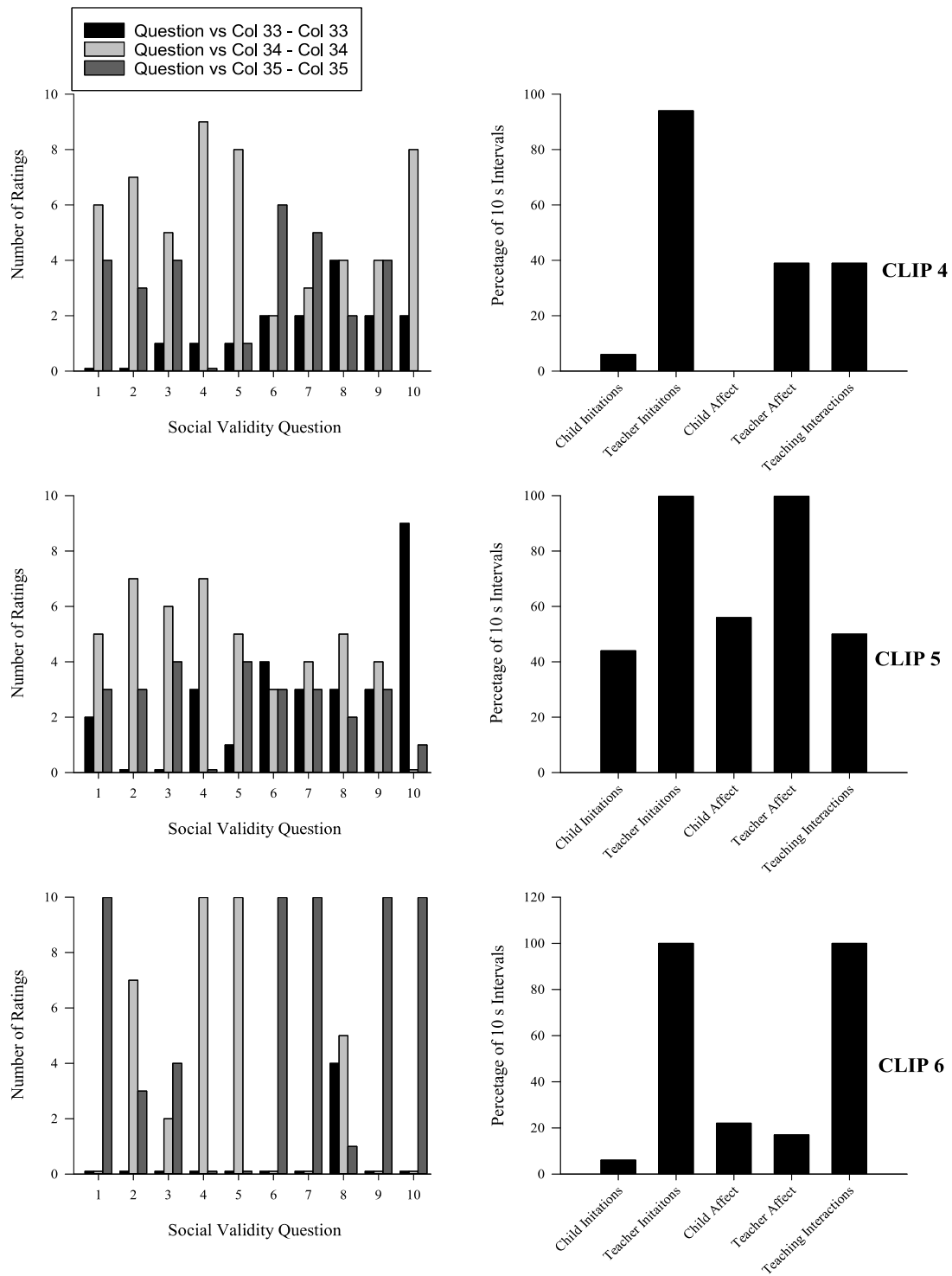


Figure 3. Comparison of social validity questions and quantitative measures (Clip 4-6).

Table 1

Participant Credentials and Years of Experience

| Participant | Credentials | Years of Experience |
|-------------|-------------|---------------------|
| 1 | BCBA | 10 |
| 2 | BCBA | 5 |
| 3 | B.A | 5 |
| 4 | B.A | 5 |
| 5 | B.S., RBT | 2 |
| 6 | B.S., RBT | 3 |
| 7 | B.S | 3 |
| 8 | B.A., RBT | 4 |
| 9 | B.A., RBT | 3 |
| 10 | B.S | 1 |

Table 2

Inclusion and Exclusion Criteria

| Video | Approach | Empirical Support | Audio/Visual | Time | No parents/siblings |
|-------|----------|-------------------|--------------|------|---------------------|
| | | | | | |
| 1 | Model A | X | X | | X |
| 2 | | X | X | | X |
| 3 | | X | X | | X |
| 4 | | X | X | | X |
| 5 | | X | X | X | X |
| 6 | | X | X | X | X |
| 7 | | X | X | X | X |
| 8 | | X | X | X | X |
| | | | | | |
| 1 | Model B | X | X | X | X |

| Video | Approach | Empirical Support | Audio/Visual | Time | No parents/siblings |
|--------------|-----------------|--------------------------|---------------------|-------------|----------------------------|
| 2 | | X | X | | X |
| 3 | | X | X | X | X |
| 4 | | X | X | | X |
| 5 | | X | X | | X |
| 6 | | X | X | | |
| | | | | | |
| 1 | Model C | X | X | | X |
| 2 | | X | X | | X |
| | | | | | |
| 1 | Model D | X | X | X | X |
| 2 | | X | X | X | X |
| 3 | | X | X | | X |
| 4 | | X | X | X | X |
| | | | | | |
| 1 | Model E | X | X | | |
| 2 | | X | X | | |
| 3 | | X | X | | |
| 4 | | X | X | | |
| | | | | | |
| 1 | Model F | X | X | | |
| 2 | | X | X | | |
| 3 | | X | X | X | X |
| 4 | | X | X | X | |
| 5 | | X | X | X | |
| 6 | | X | X | X | |

Table 3

Responses to Open-Ended Questions (Clip 1)

| |
|---|
| How would you describe this type of teaching? |
| Fast paced discrete trial with an array of different social reinforcers and play that the child enjoys. |
| Very nice and planned out discrete trial intervention. Teacher had control over the presentation and removal of reinforcers and teacher embedded himself within the reinforcing activities. |
| Discrete trial |
| A mix between DTT and naturalistic |
| I would describe this type of teaching as Discrete Trial Instruction |
| Discrete trial with embedded social interactions and consequences |
| I would describe this type of teaching as being DTT where the child is sitting at the table doing multiple trails at a time. |
| Discrete trial teaching. The teacher is controlling the reinforcer and arranging the environment to increase likelihood of success. |
| They were in an arranged environment specific for this behavior. The teacher provided a model for the behavior while integrating what seems to be previously learned behaviors. |
| Teacher-led, fast paced, material is appropriate, social reinforcers |

Table 4

Responses to Open-Ended Questions (Clip 1)

| |
|---|
| Would you hire this teacher? Why or why not? |
| Yes, the child is happy, making progress in a short amount of time and the teacher is attentive and keeps the session moving quickly. |
| Yes, he is creative with his reinforcer delivery. He is quick with his trials and for the majority of the time, he knows to end things when they are still good. |
| Yes, he's very good at keeping the child interested and happy while still working on targets. His pace/balance of reinforcement to instruction was awesome. |
| I would hire this teacher. The child seems to enjoy the interactions while learning. He also seems to be creative which helps to expand activities and interests. He is also very engaged and seems invested in the child's progress. |
| I would hire this instructor- they have very good instructional control and rapport with the client. I really like how the instructor made tasks/work just as fun and exciting as the reinforcer. Also, the instructor does a great job of differentially reinforcing and reserving |

| |
|--|
| access to the highest quality reinforcer for the highest quality response. The instructor also looks like he genuinely wants to be there with the child and really enjoys engaging with the child. |
| Yes, he is responsive to the child and knows how to build up work trials. |
| Yes, he has the child engaged in an activity, but has enough instructional control that the child completes the task when he is instructed to. Also, even though the child is asking for one activity he does still enjoy the other things the teacher is doing. |
| Yes. The teacher is enthusiastic and responsive to the child. He is balancing demands with access to preferred activities but is still maintaining high rates of responding. |
| Yes, this teacher had trials where he imitated the behavior and then faded his prompting. He was attentive to the child and delivered reinforcers for correct responding. |
| Yes, he seems very interested in the child's progress with trials and creative in finding consequences enjoyable to the child |

Table 5

Responses to Open-Ended Questions (Clip 1)

| |
|--|
| Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher? |
| I don't really like the way he grabs stimuli from the child's hand, so I may want to train him on a more natural less aggressive way of doing that. He is effective because he uses consequences that the child loves and progresses appropriately to increase criteria to reinforcement. |
| Yes, I would train or talk about setting or establishing more clear cues of when the reinforcer is coming to hopefully clean up the trials a little more! |
| No, balances work with reinforcers and has great instructional control with the child. |
| I'm not sure if I would provide more training on a specific thing based on this video: maybe have him clean up the trial a little. I think he is an effective teacher because not only does he have the necessary skills to teach (basic understanding of ABA), he also has a beautiful relationship with the child. |
| Maybe, just being a little bit more responsive to times when the child is "checking out" while working. But this instructor is great at establishing attending, teaching, and interspersing maintenance and acquisition trials. |
| I would work on the teacher building up the child's "get ready" behaviors at the table to prevent the teacher having to block the child from playing with stimuli. This doesn't have to be rigid but just so that it is more fluid. |

| |
|--|
| Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher? |
| What makes him an effective teacher is that he has the child engaged and has instructional control. He is also responsive to the child, even if he does not always provide the child's request. |
| Some. I would work on decreasing physical prompts (putting the child's hands in lap, stopping child's feet/legs). Overall this teacher is effective because he is responsive to the child moving quickly and using appropriate/valuable reinforcers. |
| Perhaps work on how to teach the child to where they are imitating so they are not dependent on the teacher. Also, work on the endurance, the child would ask for the reinforcers before criteria was met. |
| The teacher needs to work on teaching the child the skinner box. Not only how to get the reinforcer (responding correctly) but also when reinforcement comes. The child asking repeatedly to play the balloon game indicated to me that they do not know when the next reinforcer is coming. It may be good to slow down from time to time because the child is getting so excited that they aren't listening to instructions and making errors. |

Table 6

Responses to Open-Ended Questions (Clip 2)

| |
|---|
| How would you describe this type of teaching? |
| Great, fast paced trials in a more naturalistic setting. Both are happy and the child is enthusiastic about the activity. |
| This looked like discrete trial instruction on the floor. The teacher had control of a more contrived reinforcer (the figures in the plane). |
| More discrete trial than naturalistic because he's not reading the story. |
| Good! He is taking an activity that is contrived and keeping the child interested while learning. |
| Naturalistic instruction. |
| The teacher is incidentally setting up teaching opportunities while engaged in an activity with the child. |
| Naturalistic, he is able to use a book that the child may enjoy looking at and ask the child questions from all the different pages. He also showed that he retried any incorrect responses the child made. |
| I still see this type of teaching as more discrete trials than naturalistic. He's using a book to teach the actions, counting, etc., but he is presenting a discrete cue to respond and the reinforcer is not directly related to the activity. |
| The therapist presents the activity and asks different questions regarding what is being learned, he prompts when necessary. |

| |
|--|
| How would you describe this type of teaching? |
| Although the teacher is using unrelated reinforcers, he introduces first social then social reinforcers related to the book. This goes from contrived to fully naturalistic which is a nice progression. The teacher doesn't dwell too much on errors but briefly corrects them and goes back after a few new correct responses. |

Table 7

Responses to Open-Ended Questions (Clip 2)

| |
|---|
| Would you hire this teacher? Why or why not? |
| Yes, he is responsive to the child, uses proper teaching and prompting strategies depending on the child's skills. |
| Yes, I enjoy his interactions with the kids. He knows how to make activities fun and that is a difficult task to teach. |
| Yes, he keeps the child engaged and responsive. |
| I would hire this teacher. He has the child interested in the activity, has a ton of social reinforcers and seems interested in the well-being/progress of the child. He also is able to work on a variety of skills. |
| I would hire this teacher. They are doing a great job of trying to make the activity fun and exciting for the child as well as incorporating things the child is learning into social interactions with the child. Also again, this teacher looks like they are really enjoy being with the child and really enjoys interacting with the child. |
| Yes, he sets up a high number of learning opportunities and maintains a high rate of access to child preferred activities. |
| Yes, he is successfully teaching the child as well as going back to things he needed extra prompting on to be sure he is able to independently answer the question. |
| Yes. He maintains engagement and is enthusiastic. He varies trials and is responsive to the child. This teacher is also constantly referencing the child and is using reinforcing consequences. |
| Yes, he is engaged with the child and provides prompts and adequate reinforcers as necessary. |
| Yes. His focus on social consequences and activities is great and he ignores a lot of "junk" behavior and focuses on the good things the kid does. |

Table 8

Responses to Open-Ended Questions (Clip 2)

| |
|---|
| <p>Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher?</p> |
| <p>No, he appears, competent in beginning where the child is at, teaching more novel skills, and going back to assess teaching effectiveness in a small amount of time. He is also very attentive and has good control over materials.</p> |
| <p>Yes, I would like to see his reinforcement match the activity better. For example, reading a book, or looking at a book, should be fun but not so loud and rough and tumble. However, I would assume that at some point he knows to fade that out if that is what works for the child currently.</p> |
| <p>No, he does a great job reading and adjusting to the child when he's not making correct responses and also setting up the trials in a way that the child is succeeding even if it's on a different skill being targeted.</p> |
| <p>Based on this clip I would not. I think he is an effective teacher because he has the child engaged and interested. He is also able to correct the child when they have errored without the child seeming discouraged.</p> |
| <p>I would work on trying to embed the cues more into the activity and also work on following the child's lead/being responsive to what the child is attending to and embed/target skills there.</p> |
| <p>I would give him feedback on allowing more instances where the child can initiate. I feel like the child was happy but the teacher was the one managing the session.</p> |
| <p>His energy makes him an effective teacher as well as his instructional control. He obviously has rapport with the child and changes the reinforcer frequently.</p> |
| <p>Some. I would work on targeting goals more naturalistic such as reading the book, then pausing for responses and continuing the book following correct responses. I think, overall his responsiveness and arrangement of contingencies makes him effective.</p> |
| <p>He did a good job in adapting when the child was not emitting the proper response. There were prompts but not too intrusive.</p> |
| <p>Only in shaping to further criterion conditions. It would be ideal to have the teacher and child side by side with the kid making more comments by himself and the teacher praising and expanding child comments.</p> |

Table 9

Responses to Open-Ended Questions (Clip 3)

| |
|--|
| How would you describe this type of teaching? |
| Kind of weird. The child's goal seems to be vocal imitations/requests. It was described as naturalistic, but it doesn't appear natural because the child has no free access to toys and the teacher is very preoccupied with the data collection. |
| Looks a little choppy, but only because this program required a data sheet and that was hindering the teacher's attention. I feel like if that data sheet was removed, this would have been an example of teaching interaction. |
| Very fast paced discrete trial instruction |
| This was okay. The child seemed to be learning, but it didn't seem that he had/was developing a relationship with the teacher. The teacher seemed like she was doing well at what she had been trained to do. |
| Naturalistic |
| The teacher in the start seemed to be doing naturalistic teaching approach, but when the child touched his eyes when she asked him to touch Ernie's eyes, she didn't roll with it; "Oh good those are your eyes! Now where's Ernie's eyes?" I think she was fixed on using that exact toy in a certain way for teaching. |
| The teacher and child have an activity that is being used both as the learning tool and the reinforcer. The teacher allows the child to pick the character and then ask questions regarding the character on the toy. She requires him to verbally ask for what he wants. |
| Naturalistic, The targets (communication) are directly related to the activity and consequences include continuation of the activity with social attention. |
| The teacher presents the toy and waits for child's VB. She asks him for information regarding the activity, but there is a few teaching trials. |
| This is an interesting mix of naturalistic and DTI. The trials are child initiated but the questions are somewhat unrelated to the activity. The child is interested in the toy and the teacher is interested in the data sheet. |

Table 10

Responses to Open-Ended Questions (Clip 3)

| |
|---|
| Would you hire this teacher? Why or why not? |
| Yes, but she would need some training. It's good that she knows that the child's goals are and is generally happy and excited during the activity. |
| Yes. She was very responsive to her child including when she was taking data she was still trying to make an effort to keep the child engaged and she was listening to the child letting him know that even though she is busy, his responses and initiations matter. |
| Yes, she seems to be interested in what the child is learning and keeps him interested in the activity while still teaching. |
| I would with additional training. She seems to have the understanding of the basics, but needs further training on socially embedded reinforcers. She needs to be more exciting, |
| I would hire this teacher. She is doing a good job of presenting cues in a way that the child would encounter them in different contexts and using an activity that is enjoyable for the child to teach. |
| Yes, I think I could just work on her being more responsive to the child but not if I needed her to start immediately with no training. |
| I would. She is able to teach the child, she maybe a little too focused on the datasheet, but that could come from her training and what she is being asked to do. |
| Yes, with some additional training. The teacher has foundational skills and is somewhat responsive to the child. She is able to provide reinforcing consequences and is documenting responses/progress. |
| She would need to work on being engaged with the child rather than just analyzing what's occurring. |
| Yes, but I would train different things. |

Table 11

Responses to Open-Ended Questions (Clip 3)

| |
|--|
| Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher? |
| Yes, more training on responding to the child quickly and being overall more attentive and less preoccupied with data collection |
| Yes, taking approximations. With big birds eyes, she should have said yes and these are eyes and then arranged her instruction to give the correct response. |

| |
|--|
| Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher? |
| Yes, she didn't seem to be making a lot of eye contact with the child or providing a lot of social attention. She also went straight to her datasheet a lot and would still verbally respond to him but without eye contact and sometimes with a delayed reaction because she was still taking data. |
| I would provide training on socially embedded reinforcers and differential reinforcement. |
| I would work on the instructor worrying less about the datasheet and being more present/engaging with the child. I would also work on being more animated/excited when interacting with the child. |
| Be responsive to the child. Capitalize on child initiations. Work on affect, Less interaction with the datasheet. |
| I would provide training on engagement with the client as well as more efficient ways to collect data that do not take away from the child as much |
| Yes. She needs to be more flexible and responsive. She asked the child to touch Big Bird's eyes and he touched his own. She didn't accept that as an approximation or acknowledge. She went to a physical prompt. There were other missed opportunities for shaping, as well. |
| She was focused on data collecting and a specific behavior. There were maybe 2 or 3 opportunities where the teacher guided him to identify a body part, which there should have been more instances of assessing what he knows. |
| I would teach her to take data more discretely without interrupting social interactions if it were necessary to take data at that time. Also, capitalizing on approximations such as "touch Ernie's toes" and he touches his own toes to reinforce and expand to Ernie's toes. |

Table 12

Responses to Open-Ended Questions (Clip 4)

| |
|--|
| How would you describe this type of teaching? |
| Not "naturalistic" or "fun" as described at the beginning. Not mutually reinforcing or very play-like. Mostly withholding access and no acceptance of approximations to targets. |
| It was choppy and awkward. The teaching style looks like it could be effective, the environment just needs to be changed a little bit. It was good to restrict access to promote language, but you have to be careful to avoid punishing approximations. |
| I think she tries to make it naturalistic but then it turns into a weird FCT/choice making thing that breaks it up. |
| Very contrived and a bit odd. It didn't look like they were playing as the description described. It made me feel a bit uneasy. |
| Naturalistic |

| |
|--|
| How would you describe this type of teaching? |
| Very structured even when it says that it is meant to be naturalistic, seems rigid |
| The teacher has access to items the child may want in a bag and does not allow access unless it is under her (the teacher) control. There is a lot of withholding the items until she asks for them |
| Naturalistic teaching targeting communication/requests for items |
| The teacher prompts the child to ask for what she wants and then gives it to her. It's mostly questions towards the child |
| This is taking "in sight but out of reach" to the extreme. This teacher led teaching within a play context. Teacher is giving no praise or access for approximations. She did give the child choices which was good. |

Table 13

Responses to Open-Ended Questions (Clip 4)

| |
|--|
| Would you hire this teacher? Why or why not? |
| From this video, no. She can be trained though. I would not hire her because her interaction with the child, while very responsive, seems aversive, coercive and unhappy. Either seem to be enjoying the activity. |
| Yes. She did a decent job at narrating the activity and she seems to understand the goal of the activity. She just needs some better instructions. |
| No, she needs more training first and her affect is non-existent. |
| At this point, I would not want her to work with my child. She seemed more interested in completing the trials than the progress, interests, or initiations of the child |
| I would hire this teacher. She is doing a good job of being responsive to the child's initiations and preferences and using those items to teach. |
| No, she seems very interested in controlling the session and does not respond to the child. |
| I would. I think she is doing what she has been told to do but may need experience with other ways of teaching in order to be more effective. |
| No. She doesn't seem to enjoy interacting with the child and is not responsive nor actively participating throughout the clip. |
| She seems to not be interested in the child and lacks instructional control. The child would simply grab what it was that she wanted |
| Yes, she clearly has much knowledge of this particular teaching style and could be trained if given the time and supervision. |

Table 14

Responses to Open-Ended Questions (Clip 4)

| |
|--|
| <p>Would you provide more training to this teacher? If so, in what areas? If not, what skills to you think make them an effective teacher?</p> |
| <p>Yes – how to be more fun, deliver reinforcers naturally and arrange the environment so that she as controlling them in a way that doesn't look like she's pulling away and punishing the child's pointing.</p> |
| <p>Yes. I would teach her to look at how her set up affects her teaching session. If she placed the bag of materials next to her but still out of reach of the child she could then embed herself more in the activity and remove the struggle for materials</p> |
| <p>Yes – affect, naturalistic teaching, not talking like a robot, reinforcing without making the child wait and give several responses for every single item they initiate to, making play more fun rather than going through a bag of items and the same chain the entire time</p> |
| <p>I would provide more training to the teacher on playing, socially embedded reinforcers, and being responsive to the child</p> |
| <p>I would work on the teacher worrying less about the stimuli bag and also modeling play responses/expansions more. I would also work on varying the comments, so it does not sound so scripted and work on affect being more favorable and less neutral/flat.</p> |
| <p>Be responsive, do not punish the child's appropriate behavior, shape up eye contact naturally instead of continuing to block access to items, balance child led vs. teacher led, affect.</p> |
| <p>I would work on affect of the teacher, her face is very neutral. Also allow some access to items that she does not necessarily ask for as well as a more balanced session (more back and forth with the child)</p> |
| <p>Yes, I would focus on her being more engaged, modeling play actions, being responsive to child's initiations, and not being so rigid with items. I would also train on how to increase learning opportunities and expand communication. I would also work on how to better intersperse acquisition targets with maintenance targets</p> |
| <p>The teacher could work on providing more learning opportunities outside of those already planned. Use the child's behavior to prompt for more responses.</p> |
| <p>Accepting approximations, toy presentation, affect, what child-led means</p> |

Table 15

Responses to Open-Ended Questions (Clip 5)

| |
|---|
| How would you describe this type of teaching? |
| Ineffective- the child is not attending unless teacher is withholding desired items. Teacher withholds items, waits for the child to respond and then delivers access |
| Honestly, creepy. The teacher sits there the majority of the time narrating in a “teacher voice”. If I were that child I would be annoyed. |
| Naturalistic |
| Rough. It was only teaching a few targeted skills. It did not expand to anything social. Rigid. |
| Naturalistic – PRT |
| The teaching is trying to be naturalistic but is not responsive and capitalizing on the child’s interests. This is making the child upset and leading to her disengaging |
| The teacher is providing access to items when she is requesting them and expanding on her language as well, in a naturalistic way |
| Naturalistic teaching for communication/requests |
| The teacher would present options for the child then give the toy after the child asked for it |
| Although there are a lot of initiations, responses and choices there is something off with the “flow”. It is unclear what the teacher expects from the child when requesting. The child will say the same thing three times and only gain access to the toy on the third time |

Table 16

Responses to Open-Ended Questions (Clip 5)

| |
|--|
| Would you hire this teacher? Why or why not? |
| No. She seems stressed, has very little control over the environment and pulls away from the child a lot. Doesn’t provide models quickly enough. She seems unresponsive to the child – yelling loudly and acting overly animated when it appears the child is not interested in that kind of activity on her |
| Yes. Again, it appears that she does well at following program instructions, she just needs some more training |
| Yes, she seems pretty responsive to the child and keeps her interested in the activity |
| At the current state no. She did not interact with the child beyond demands. The child did not seem interested in her, didn’t look like she was having fun. This was all work, no play. |

| |
|--|
| Would you hire this teacher? Why or why not? |
| I would hire this instructor. She is providing instructions and good expansions and models with appropriate timing. And she is also being responsive to what the child is doing and initiation in order to teach. |
| No, she is not responsive and not good at reading the child's affect. This was not a good teaching interaction, she should have adjusted her behavior. |
| She seems to want the child to improve, so I would hire her. She does not need to improve in many areas though before I would allow her to work individually with a client |
| No. She isn't moving around the space with the child and isn't engaging with her. The teacher is just holding items to deliver if the child requests and is asking for the items back periodically. I didn't observe much teaching/opportunities to learn skills that weren't already in the child's repertoire. |
| She was able to guide the child in some instances to ask for toys or help. There was good engagement with the child and the activity itself. |
| Yes. She has a lot of skills that just need to be refined and put in more of a natural/social context. |

Table 17

Responses to Open-Ended Questions (Clip 5)

| |
|--|
| Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher? |
| Yes. She needs more training on how to arrange and control the environment, how to respond to child initiations and when to provide models. |
| Yes. I would focus on how to embed herself in the activities the child is interested in and how to better model and expand language with "this,that", pausing more to give the child a chance to respond and initiate more. |
| Yes, maybe making it a little less robotic (her prompts/models) |
| Yes! To balance between work and play, play narration, socially embedded reinforcers, and just social interactions with the child in general. |
| The instructor is doing an overall good job of reinforcing approximations. I would work on making shaping more fluid and natural |
| Be responsive, how to naturally teach, adjust behavior based on the child's response, reinforce appropriate communication, no need to give so many instructions/demands, how to run NET, deliver reinforcement and social praise |
| I would provide more training in changing/adding items to the play for more opportunities as well as other ways to have the child request than pulling items away when she is not asking for them like the teacher wants/expects |

| |
|---|
| Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher? |
| Yes I would work on the teacher engaging with the child and embedding more opportunities to request items. I would also work on narrating more naturally and not using sentence fragments when modeling requests. I would also target more eye contact/social referencing |
| She was good in being engaged with the child but when presenting toys there were moments when the child lost interest because she didn't have access to them; work on providing prompts for the child. |
| Accepting and expanding approximations. Not repeating the instruction several times without prompting. How to engage the child in a less robotic way. |

Table 18

Responses to Open-Ended Questions (Clip 6)

| |
|---|
| How would you describe this type of teaching? |
| Horrible. Teacher continually places demands, provides no reinforcement and the child seems very socially interested but the teacher does not capitalize on that. Prompting is not effective and no teaching is happening. |
| Straight out of a nightmare |
| Horrible |
| What?! Super un-natural. Not effective. Oddly prompted. Aversive. |
| Discrete trial instruction – with some other really bad stuff going on |
| What not to do ever! |
| Very invasive and a lot of physical prompting before the child even has a chance to respond |
| Discrete trial to target matching with poor teaching and over prompting |
| The teacher presents a match to sample activity and prompts the child for the correct response |
| The session starts out pretty good until the child errors and then more aggressive methods are used. It is clear to me that the boy knows how to look so the “not looking” appears to be a motivation deficit and the teacher is not recognizing this and treating it as a skill deficit. |

Table 19

Responses to Open-Ended Questions (Clip 6)

| Would you hire this teacher? Why or why not? |
|---|
| No. She does not start where the child is at with attending or learn to learn skills. She physically pushes his head down to “look” and she does not seem fun at all. The child is not progressing or making correct responses independently. The child also appears to be blocked into a corner. |
| If I did, I would ask her to play with a child, no teaching. I would then observe how she interacts outside of teaching. I really cannot make that decision based on this clip alone. I don’t know what her contingencies were |
| No. Forcing the kid to attend rather than shaping and reinforcing. |
| Not at this point. She has no reinforcer. The child’s behavior is hardly changing throughout the clip and she is not responsive to the child. It’s her way or the highway |
| No, I would not hire this teacher. She seems very abrasive and is very rough with the child when using physical prompts to prompt the child to “attend” |
| No. She is not teaching and that is not what is meant by physical prompt |
| No. The head moving and amount of trials with reinforcement (“good boy”) does not seem to be effective |
| No, never. She is over prompting and not providing reinforcing consequences. She is running through a script and not being responsive to the child. She doesn’t teach anything and just represents the trial when he errors without changing the presentation. |
| No, she uses physical prompts to force the child to look at the activity. The child is not at all interested in what they are doing. She also prompts every response and there seems to be no functional reinforcer. |
| Yes, if she completed proper training and showed competence in all aspects of training and stopped using aversive methods. |

Table 20

Responses to Open-Ended Questions (Clip 6)

| Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher? |
|--|
| Being fun, delivery of reinforcement, effective prompting strategies, socially embedding consequences of gaining attention to instructions and stimuli in a loving way |

| |
|--|
| <p>Would you provide more training to this teacher? If so, in what areas? If not, what skills do you think make them an effective teacher?</p> |
| <p>Keep trials short, keep the session short. Use environmental prompts, not physical to get attention. So many things! Also, keeping a healthy rate of reinforcer delivery and number of trials.</p> |
| <p>Yes, prompt hierarchies, instructional control building, rapport building, shaping, reinforcing, everything!</p> |
| <p>Yes! All areas! Start her training over! Stop with the weird physical prompts</p> |
| <p>I would provide a lot of additional training on everything! Establishing attending, appropriate prompting strategies to use, fading the prompts, being nice, kind and loving to the child (who is so cute and so sweet), varying social praise, being responsive to the child</p> |
| <p>Deliver reinforcement, stop pushing the child's head or hands down, learn to shape, know when to stop, learn how to prompt, stop saying "look" it is doing to become a poisoned cue, be responsive, just stop</p> |
| <p>Other ways to prompt a child. Maybe teaching the skills of looking before requiring him to complete more difficult tasks. Providing access to items or reinforcer that he actually enjoys.</p> |
| <p>Absolutely! I would work on not over-prompting, how to shape attending, how to identify reinforcing consequences, how to teach following errors and what is a reasonable amount of time to spend on one program before varying/changing up trials. And under no circumstances should you forcefully move a child's head to "look"</p> |
| <p>She needs to work on skills to arrange the environment to where the child would naturally be engaging with the activity</p> |
| <p>To analyze skills vs motivation deficits, how to correct errors or at least how to clear table and re-present trial and use appropriate errorless method to achieve response then ask for independent, other methods besides punishment, how to find reinforcers, how to engage socially.</p> |

APPENDIX A
DATASHEET

| Seconds | Child Initiations | Teacher Initiations | Child Affect | Teacher Affect | Teaching Interactions |
|---------|-------------------|---------------------|--------------|----------------|-----------------------|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |
| 26 | | | | | |
| 27 | | | | | |
| 28 | | | | | |
| 29 | | | | | |
| 30 | | | | | |
| 31 | | | | | |
| 32 | | | | | |
| 33 | | | | | |
| 34 | | | | | |
| 35 | | | | | |
| 36 | | | | | |
| 37 | | | | | |
| 38 | | | | | |
| 39 | | | | | |
| 40 | | | | | |
| 41 | | | | | |
| 42 | | | | | |
| 43 | | | | | |
| 44 | | | | | |
| 45 | | | | | |
| 46 | | | | | |
| 47 | | | | | |
| 48 | | | | | |
| 49 | | | | | |
| 50 | | | | | |
| 51 | | | | | |
| 52 | | | | | |
| 53 | | | | | |
| 54 | | | | | |
| 55 | | | | | |
| 56 | | | | | |
| 57 | | | | | |
| 58 | | | | | |
| 59 | | | | | |
| 60 | | | | | |

APPENDIX B
OBSERVATION CODE

Child Initiation – 10-second, Partial Interval Recording

During the 10-second interval, mark whether the child was engaging in verbal behavior towards the teacher during any part of that interval.

A child initiation is defined as any time the child makes an unprompted bid for social attention from the teacher either by requesting, commenting, making eye contact or gesturing. Excludes any time the child is orienting his or her body towards the teacher but not initiating a social bid for attention or any other form of non-verbal responding.

Examples

- The teacher is sitting on the carpet in the library and the child is playing at the table. The child then approaches the teacher and says, “Dinosaurs!”, and the two begin to play with the dinosaurs together.
- The teacher and the child are sitting across from each other at the table. The teacher gives the child an instruction to “wave and stand up,” and the child makes eye contact with the teacher before asking to play a rocket ship game.

Non-examples

- The teacher is sitting on the carpet in the library and the child is playing at the table. The teacher plays with the dinosaurs in an attempt to entice the child over to the carpet. The child stays playing alone at the table for 5-10 seconds, and the teacher says, “Come over here and check out these dinosaurs.” The child then approaches the teacher and they start playing with the dinosaurs together.
- The teacher and the child are sitting across from each other at the table. The teacher gives the child an instruction to “wave and stand up,” and the child responds by waving and standing up, but does not make eye contact with the teacher. Once the teaching interaction is over, the child continues to sit in the chair across from the teacher without talking or looking at the teacher.

Teacher Initiation – 10-second, Partial Interval Recording

During the 10-second interval, mark whether the teacher was engaging in verbal behavior towards the child during any part of that interval.

A teacher initiation is defined as any time the teacher makes an unprompted bid for social attention from the child either by requesting, commenting, making eye contact, or gesturing. Excludes any time the teacher is orienting his or her body towards the child but not initiating a social bid for attention, or any other form of non-verbal responding.

Examples

- The teacher is sitting on the carpet in the library and the child is playing at the table. The child then approaches the teacher and says, “Dinosaurs!”, and the two begin to play with the dinosaurs together. During the interaction, the teacher makes eye contact with the child and says, “This is so much fun! Let’s make our dinosaurs chase

- each other” and begins to move his dinosaur towards the child, who engages in the game of chase.
- The teacher and the child are sitting across from each other at the table. The teacher gives the child an instruction to “wave and stand up,” and the child makes eye contact with the teacher before asking to play a rocket ship game. The teacher plays the rocket ship game with the child, and as the child sits back down in the chair, the teacher points towards the ceiling and says, “Wow, we just flew so high in our rocket ship!”.

Non-examples

- The teacher is sitting on the carpet in the library and the child is playing at the table. The teacher plays with the dinosaurs in an attempt to entice the child over to the carpet. The child stays playing alone at the table for 5-10 seconds, and then looks over at the teacher, who says, “Yeah check this out, I have the dinosaurs!”.
- The teacher and the child are sitting across from each other at the table. The teacher gives the child an instruction to “wave and stand up,” and the child responds by waving and standing up. The teacher turns away from the child to take data on a clipboard.

Child Affect – 10-second, Partial Interval Recording

During the 10-second interval, mark whether the child was displaying positive affect during any part of that interval.

Positive affect is defined as visible or audible indicators of happiness and enjoyment (e.g., smiling, laughing, physical affection).

Examples

- The child and teacher are playing on the playground. The child asks to sit on the swings and the teacher picks her up and puts her on the swing. As the teacher is pushing the child, the child is laughing and saying, “Push me higher”.
- The child and teacher are sitting across from one another at the table coloring a picture. The child asks for the paint and the teacher says, “Sure, we can use the paint” and the child smiles before dipping his paintbrush in the paint.

Non-examples

- The teacher is reading a book to the child on the couch, but the child is crying.
- The teacher and the child are playing with the building blocks together. The teacher knocks down the tower that they built and the child says, “No!” with an unfavorable affect and moves to the other side of the room to play with the cars instead.

Teacher Affect – 10-second, Partial Interval Recording

During the 10-second interval, mark whether the teacher was displaying positive affect during any part of that interval.

Positive affect is defined as visible or audible indicators of happiness and enjoyment (e.g., smiling, laughing, physical affection).

Examples

- Teacher and child are playing with a deflated balloon. The child is looking at Teacher giggling with anticipation while Teacher blows air into the balloon. Teacher is raising his eyebrows and looking at the child as he fills the balloon. When the balloon is full, Teacher says, “Ready, set…” and the child says, “Go!”. Teacher releases the balloon saying “Wow!” and both watch the balloon jet across the room, grinning with excitement.
- Teacher and child are playing doctor. Teacher pretends to sneeze and cough. The child pretends to check Teacher’s heartbeat while saying, “Oh no” and looking at Teacher. When the child says, “Oh no,” the teacher smiles and laughs. Teacher also looks at the child while narrating what the child is doing and pretending to be sick. When the child is done playing with the doctor set, Teacher hugs the child and says, “Thank you for taking care of me” while smiling.

Non-examples

- Teacher and child are playing with a deflated balloon. The child reaches for the balloon. Teacher looks at the child and begins to blow air into the balloon, and the child continues to jump and reach for the balloon. Teacher keeps moving the balloon out of reach and has a frown on his face. When the balloon is full, Teacher says, “Say balloon,” and the child continues to reach for the balloon without responding to Teacher. Teacher repeats, “Say balloon,” and the child begins to cry, reaching for the balloon. Teacher continues to repeat, “Say balloon” towards the child with a neutral affect.
- Teacher is playing doctor. Teacher pretends a doll is sneezing and coughing. Teacher holds up the different tools in the doctor kit and labels them as she uses them on the doll, with a neutral affect. When the child initiates for the teacher to engage in new play actions with the items, the teacher says, “No” and continues to play, while the child moves on to a different activity.

Teaching Interactions

Mark the beginning of a teaching interaction (1) and the end of a teaching interaction (0). A teaching interaction begins when the teacher presents an opportunity for the learner to respond. The learner then makes a correct response or an approximation to the target response. The teacher then delivers a responsive consequence. The teaching interaction ends when the child is no longer consuming the reinforcer or when the teacher presents an opportunity for a new teaching interaction.

Examples

- The child and teacher are playing with bubbles together. The child is oriented towards the teacher, who is blowing the bubbles and saying, “Wow, there are so many bubbles!” while the child laughs and pops the bubbles. Once all the bubbles have been popped, the teacher puts the wand into the bubbles, puts the wand to her mouth, and smiles at the child. The child says, “More bubbles!” and the teacher immediately begins to blow more bubbles. The child and teacher laugh and pop the bubbles together for 10 more seconds before the child turns his attention to another activity.
- The child and teacher are sitting across from each other alongside a table. There are toy animals on the table. The teacher tells the child, “Show me that you are ready to work” and the child puts her hands in her lap. The teacher tells the child, “Nice listening!” and the child smiles at the teacher. The teacher then asks the child, “Can you make the cat jump over the car?” and the child picks up the cat and moves it over the car. The teacher excitedly says, “Yeah, that’s making the cat jump over the car, nice job!”. The teacher then gives the child her favorite toy and they play with it together until it is time for a new trial.

Non-examples

- The child and teacher are sitting at the table and playing with Play-dDoh. The teacher hands a tub of Play-Doh to the child without the child requesting the item or making any eye contact.
- The child and teacher are in the classroom. The child approaches the shelf with the bubbles and the teacher hands the bubbles to the child, who goes to the other side of the classroom without the teacher and blows the bubbles by himself.
- The child and teacher are sitting at the table playing with a puzzle. The child makes eye contact with the teacher and says an approximation to the word “puzzle,” but the teacher does not deliver access to the item.

APPENDIX C
SOCIAL VALIDITY SURVEY

1. Is the teacher happy?

| | | |
|----|----------|------|
| No | Somewhat | Very |
|----|----------|------|

2. Is the child happy?

| | | |
|----|----------|------|
| No | Somewhat | Very |
|----|----------|------|

3. The child and teacher are interested in one another

| | | |
|----|----------|------|
| No | Somewhat | Very |
|----|----------|------|

4. The child and teacher are interested in the activity

| | | |
|----|----------|------|
| No | Somewhat | Very |
|----|----------|------|

5. The child and the teacher are mutually engaged together with an activity

| | | |
|----|----------|------|
| No | Somewhat | Very |
|----|----------|------|

6. There is a balance of initiations between the child and teacher

| | | |
|----------|---------|-------|
| Disagree | Neutral | Agree |
|----------|---------|-------|

7. There is a balance of responses from the child and teacher

| | | |
|----------|---------|-------|
| Disagree | Neutral | Agree |
|----------|---------|-------|

8. The teacher created an appropriate amount of teaching opportunities

| | | |
|------------|----------|-----------|
| Not enough | Moderate | Excellent |
|------------|----------|-----------|

9. The teacher has an effective teaching session

| | | |
|----------|---------|-------|
| Disagree | Neutral | Agree |
|----------|---------|-------|

10. The teacher is arranging the environment and delivering access to reinforcing items/activities

| | | |
|----------|---------|-------|
| Disagree | Neutral | Agree |
|----------|---------|-------|

11. How would you describe this type of teaching?

12. Would you hire this teacher? Why or Why not?

13. Would you provide more training to this teacher?
 - a. If so, in what areas?
 - b. If not, what skills do you think make them an effective teacher?

APPENDIX D
DESCRIPTIONS OF VIDEOS

Video 1 – “Model A” includes discrete trial teaching and often teaches a new skill while also systematically interspersing acquired skills. In this clip, a 5-year-old child with ASD is learning how to make an animal “run” through massed trials (continually repeating the same SD). Other directions the child has already learned are then intermixed in expansion trials. The number of acquired directions given before returning to the new direction “run” is gradually increased. Typically, a new action (such as “run”) would be considered mastered in this program when a child can respond correctly 80-100% of the time across two sessions with at least four other acquired instructions intermixed before returning to the new instruction.

Video 2 – “Model A” emphasizes the importance of facilitating generalization of skills to the natural environment. In this clip, a 3-year-old child with ASD who has already learned to answer a variety of different questions is learning to answer those questions while looking at pictures in books. The child has already demonstrated an ability to answer specific types of questions (identifying actions, colors, objects, etc.). His ability to answer those questions when novel stimuli are used, as well as his ability to quickly learn new information, is now being practiced.

Video 3 – This video clip shows a 3-and-a-half-year-old boy with ASD. “Model B” is an effective way to teach skills during play and other daily routine activities.

Video 4 – This video clip shows a preschool teacher using “Model C” with a 2-year-old girl with ASD. Notice how the teacher follows the child’s lead in choosing an activity and determining how to play with a baby doll and pretend food. The child knows many of the food names (maintenance tasks), but she is still learning some food names (acquisition tasks). The teacher is also encouraging the child to share, and throughout the segment the teacher is able to fade prompts in this area. The teacher models several play behaviors that the child imitates

spontaneously or with direction from the teacher. The child is able to complete one-step play actions (maintenance tasks), and is now learning two-step actions and turn-taking (acquisition tasks). Notice the natural back-and-forth play between the teacher and child. The teacher maintains control of the materials and reinforces the child's behavior by providing access to the toys. However, these learning trials are presented in a naturalistic, fun manner.

Video 5 – In this video clip, a therapist and 2-year-old girl are playing on the floor with a selection of toys based on the child's interests and developmental level. The therapist offers choices to the child throughout the segment. The child is learning to tolerate turns and share toys, as well as use three-word phrases such as "I want baby" (acquisition tasks). The child is able to readily use single words for requesting and commenting, such as "purse," "brush," "kiss," and occasional two-word phrases such as "put on" (maintenance tasks). Notice in the video that the therapist models different words for requesting when the child uses "open" and "let's trade," as the child tends to overuse these words. The child and therapist are playing together through naturalistic interactions and in the child's home while the therapist is still controlling the materials and providing cues to increase the child's language and play skills.

Video 6 - This 6-year-old child with ASD is working with his teacher on matching shapes. Cards with outlines to the target shape are used to increase accuracy. The student is given the SD (command), "match," and is given a three-dimensional shape to match. Components of DTT are utilized including the SD, prompting (which in this case is primarily gestural), and enthusiastic reinforcement for correct trials. Errorless learning is noted, as the therapist uses prompting to ensure correct responses.

APPENDIX E
INTEROBSERVER AGREEMENT (IOA) QUIZ

1. What are the three components of the teaching interaction definition?
2. Give an example of a teacher displaying positive affect.
3. Why is the following a non-example of a child having positive affect?
The teacher is doing a puzzle and the child is crying.
4. Is the following example an example of a teaching interaction or a non-example? Why?
The child and the teacher are sitting at the table playing with Play-Doh. The teacher hands a tub of Play-Doh to the child without the child requesting the item or making any eye contact.
5. Fill in the blank: A child initiation is defined as any time the child makes an _____ bid for social attention from the teacher either by requesting, commenting, making eye contact or gesturing.
6. Give an example of a teacher initiation.
7. What is the definition of a child initiation?
8. How do you determine the beginning of a new teaching interaction?
9. What is the interval recording method for this study?
10. True/False: When a teacher orients his or her body towards the child but does not initiate a social bid for attention with verbal or non-verbal behavior, this is a teacher initiation.

REFERENCES

- Ala'i-Rosales, D., Thorisdottir, S., & Etzel, B.C. (2003). Behavioral teacher training programs. In K.S., Budd & T. Stokes (Eds.), *A small matter of proof: The legacy of Donald M. Baer* (pp.151-165). Reno, NV: Context Press.
- Ala'i-Rosales, S., Toussaint, K.A., & McGee, G.G. (2017). Incidental teaching: Happy progress. In J. Leaf (Ed.), *Handbook of social skills and autism spectrum disorder*. Springer.
- Allen, K. D., & Warzak, W. J. (2000). The problem of parental nonadherence in clinical behavior analysis: Effective treatment is not enough. *Journal of Applied Behavior Analysis*, 33, 373-391.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Anderson, Claire T. (2010). *Comparing indices of happiness during teaching interactions*. (Unpublished master's thesis). University of North Texas, Denton, Texas.
- Autism Navigator (2017). Retrieved from: <http://www.autismnavigator.com>
- Baer, D.M., Wolf, M.M., & Risley, T.R. (1968). Some current dimensions of behavior analysis, *Journal of Applied Behavior Analysis*, 1(1), 91-97.
- Browder, D.M., Spooner, F., Ahlgrim-DeLzell, L., Harris, A.A., & Wakemanxya, S. (2008). A meta-analysis on teaching mathematics to students with significant cognitive disabilities. *Exceptional Children*, 74(4), 407-432.
- Carr, J., Austin, J.L., Britton, L.N., Kellum, K.K., & Bailey, J.S. (1999). An assessment of social validity trends in applied behavior analysis, *Behavioral Interventions*, 14(4), 223-231.
- Carnine, D. W., & Fink, W T. (1978). Increasing rates of presentation and the use of signals in elementary classroom teachers. *Journal of Applied Behavior Analysis*, 11, 35-46.
- Centers for Disease Control and Prevention. (2017).
- Cohen, D., & Babey, S.H. (2012). Candy at the cash register – A risk factor for obesity and chronic disease. *The New England Journal of Medicine*, 367, 1381-1383.
- 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, 235-246.
- Eldevik, S., Hastings, R.P., Hughes, J.C., Jahr, E., Eikeseth, S., & Cross, S. (2009). Meta-analysis of Early Intensive Behavioral Intervention for children with autism. *Journal of Clinical Child and Adolescent Psychology*, 38, 439-450.

- Greer, R. D. (2002). *Designing teaching strategies: An applied behavior analysis systems approach*. New York: Academic Press.
- Greer, R.D., & McDonough, S.H. (1999). Is the learn unit a fundamental measure of pedagogy? *The Behavior Analyst*, 22, 5-16.
- Harris, S.L., & Handleman, J.S. (2000). Age and IQ at intake as predictors of placement for young children with autism: A four-to-six year follow-up. *Journal of Autism and Developmental Disorders*, 30, 137-142.
- Hawkins, R.P. (1991). Is social validity what we're interested in? *Journal of Applied Behavior Analysis*, 24, 205-213.
- Howard, J.S., Sparkman, C.R., Cohen, H.G., Green, G., & Stanislaw, H. (2005). A comparison of intensive behavior analytic and eclectic treatments for young children with autism. *Research in Developmental Disabilities*, 26(4), 359-383.
- Hurt, A.A., Grist, C.L., Malesky, L.A., & McCord, D.M. (2013). Personality traits associated with occupational 'burnout' in ABA therapists. *Journal of Applied Research in Intellectual Disabilities*, 26, 299-308.
- Ingersoll, B. & Schreibman, L (2006). Teaching reciprocal imitation skills to children with autism using a naturalistic behavioral approach: effects on language, pretend play, and joint attention. *Journal of Autism and Developmental Disorders*, 36(4), 487-505.
- Ingham, P., & Greer, R.D. (1992). Changes in student and teacher responses in observed and generalized settings as a function of supervisor observations. *Journal of Applied Behavior Analysis*, 25, 153-164.
- Koegel, R.L., O'Dell, M.C., & Koegel, L.K. (1987). A natural language teaching paradigm for nonverbal autistic children. *Journal of Autism and Developmental Disorders*, 17(2), 187-200.
- Koegel, R.L., Bimbela, A., & Schreibman, L. (1996). Collateral effects of parent training on family interactions. *Journal of Autism and Developmental Disorders*, 26, 347- 359.
- Koegel, R.L., & Egel, A.L. (1979). Motivating autistic children. *Journal of Abnormal Psychology*, 4, 418-426.
- Koegel, R. L., Werner, G. A., Vismara, L. A., & Koegel, L. K. (2005). The effectiveness of contextually supported play date interactions between children with autism and typically developing peers. *Research and Practice for Persons with Severe Disabilities*, 30, 93-102.
- Leaf, J.B., Leaf, R., McEachin, J., Taubman, M., Ala'i-Rosales, S., Ross, R.K., Smith, T., & Weiss, M.J. (2016c). Applied behavior analysis is a science and, therefore, progressive. *Journal of Autism and Developmental Disorder*, 46(2), 720-731.

- Leaf, J. B., Oppenheim-Leaf, M. L., Call, N. A., Sheldon, J. B., Sherman, J. A., Taubman, M. (2012a). Comparing the teaching interaction procedure to social stories for people with autism. *Journal of Applied Behavior Analysis*, 45, 281-298.
- Ledford, J.R., & Wolery, M. (2013). An analysis of measurement and reporting practices. *Journal of Early Intervention*, 35(2), 173-193.
- Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, 55, 3-9.
- Matson, J.L., & Kozlowski, A.M. (2011). The increasing prevalence of autism spectrum disorders. *Research in Autism Spectrum Disorders*, 5, 418-425.
- McEachin, J. J., Smith, T., & Lovaas, O. I. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. *American Journal on Mental Retardation*, 97, 359-372.
- Oppenheim-Leaf, M. L., Leaf, J. B., & Call, N. A. (2012). Teaching board games to two children with an autism spectrum disorder. *Journal of Developmental and Physical Disabilities*, 24, 347-358.
- Reichow, B. (2012). Overview of meta-analyses on early intensive behavioral intervention for young children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 42, 512-520.
- Schwartz, I.S., & Baer, D.M. (1991). Social validity assessments: Is current practice state of the art? *Journal of Applied Behavior Analysis*, 24(2), 189-204.
- Smith, T., Groen, A.D., & Wynn, J.W. (2000). Randomized trials of intensive early intervention for children with pervasive developmental disorders. *American Journal of Mental Retardation*, 105, 269-285.
- Symes, M.D., Remington, B., Brown, T., & Hastings, R.P. (2006). Early intensive behavioral intervention for children with autism: Therapists' perspective on achieving procedural fidelity. *Research in Developmental Disabilities*, 27, 30-42
- Weinkauff, S.M., Zeug, N.M., Anderson, C.T., & Ala'i-Rosales, S. (2011). Evaluating the effectiveness of a comprehensive staff training package for behavioral interventions for children with autism, *Research in Autism Spectrum Disorders*, 5, 864-871.
- Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, 11, 203-214.