

USING A CONTEXTUAL PLAY INTERVENTION TO INCREASE JOINT ATTENTION IN
PRESCHOOL AGED CHILDREN WITH AUTISM SPECTRUM DISORDER

By

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ABSTRACT

Joint attention and play skills are pivotal in the development of language and communication for a young learner. Many children with autism spectrum disorder (ASD) demonstrate deficits in joint attention and play skills. A multiple baseline design across three participants was used to assess the efficacy of modeling toy play on contextual play behaviors as well as the effectiveness of teaching joint attention through a contextual play intervention in preschool aged children with ASD. During baseline all three participants demonstrated minimal joint attention and contextual play behaviors. Within the contextual play intervention, one of three participants demonstrated an increase in joint attention and all three of the participants demonstrated an increase in contextual play behaviors.

Keywords: joint attention, contextual play, autism spectrum disorder, modeling

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INTRODUCTION

Joint attention is an early developing communicative skill in which two people use gestures and gaze to share attention with respect to an object or event (Jones & Carr, 2004). Joint attention is one of the most crucial aspects to a young learner's communication and language skills and is one of the earliest forms of non-verbal communication that a child makes (Taylor & Hoch, 2008). Joint attention is considered a foundational skill associated with the development of language, play, imitation, and social behavior in both typically developing children and children with ASD (Mundy et al., 2007). This skill is important for more reasons than just communication and language for typically developing children, as well as children with ASD. It is also a pivotal skill in the introduction to play skills for preschool aged children. Children with ASD often demonstrate more nonfunctional play skills than typically developing children would. Some of the characteristics of these play differences are repetitive use of objects, lining up toys in a specific manner, deficits in imaginative play, and restricted interests (Thiemann-Bourque, 2019). In typically developing children and children with ASD, the onset of higher-level language skills has been shown to increase the emergence of more symbolic play compared to those with less developed language skills (Thiemann-Bourque., et al, 2019). The higher level of communication and language skills a child has, the more functional play will start to develop and improve.

Researchers have found that there are two forms of joint attention (a) responses to another person's bid for attention and (b) initiations for joint attention (Jones & Carr, 2004). Typically developing children usually begin to engage in joint attention between the ages of 9-18 months.

Children with ASD often lack joint attention skills and is recognized as one of the first indicators of ASD at a young age (Taylor & Hoch, 2008). Behavioral interventions may help remediate this deficit by explicitly teaching each component of a joint attention repertoire. For example, Taylor & Hoch (2008), demonstrated how social contingencies can be used as reinforcement, and supported the idea that the presence of an adults bid, and motivating operators can be arranged to increase joint attention responses. Prior to this study, research on using social contingencies as reinforcement for joint attention responses had not been examined.

In another example, Rozenblat., et al, (2019) used multiple exemplar training, textual prompts, audio script, and script fading procedures to improve joint attention in four young adults with ASD. Following the intervention, all four of the participants exhibited improvement in initiating joint attention within 14 sessions of intervention, and all four participants generalized joint attention skills to stimuli not used in training. This study demonstrates that using multiple exemplar training and script procedures during intervention is an effective way to teach joint attention.

In a study conducted by Hansen., et al, (2018), researchers demonstrated that with little training to caregivers, the individual caring for a child with ASD can be taught to deliver a bid for joint attention, and to prompt their child to look at the targeted stimulus, and then back at them. The researcher taught the caregivers to use prompting, time delay, and elements of naturalistic teaching to teach joint attention. The children's independent responses did approach the level of response to joint attention that would be considered "normal" for neurotypical children.

Finally, Gomes., et al. (2020) demonstrated that children with ASD were able to learn a generalized repertoire of initiating bids for joint attention across a variety of settings and targeted

stimuli. Examples include in the presence of a stimuli that would be occurring naturalistically (visually and auditorily) and generalizing from teaching to non-teaching stimuli and conditions. Bids for joint attention generalized across stimuli within taught categories and to stimuli from an untaught category after the intervention. This study demonstrated that children with ASD can generalize initiating joint attention across a variety of settings and targeted stimuli.

The studies described above are representative of the overall approach in applied behavior analytic (ABA) studies which teach joint attention to children with ASD through prompting, social contingencies, multiple examples, and reinforcement (Gomes et al., 2020; Hansen et al., 2018; Rozenblat et al., 2019; Taylor & Hoch 2008). However, typical children appear to acquire joint attention through interactions with adults that are more developmentally oriented, such as during play or naturally occurring interactions in real world scenarios (Taylor & Hoch, 2008). There is limited research of behavioral strategies to teach joint attention to children with ASD in such a manner.

In one notable exception, Basso and colleagues (2021) taught joint attention to school-aged children with ASD through the use of something they called a functional play procedure. The purpose of the study conducted by Basso et al., (2021), was to use functional (hereafter described as contextual) play as the means to teach joint attention in the hopes that contextual play would add another element of motivation to the children. They used direct reinforcement of the toy in the occurrence of joint attention. Basso et al., (2021) included measurements for both joint attention and contextual play, as well as assessed for generalization of training across person, setting, and stimuli. The emergence of the Basso et al. study may be an advancement in the way that behavior analysts teach joint attention in that it occurs during simultaneous

instruction in contextual play, which is thought to be how typically developing children acquire a joint attention repertoire.

The present study seeks to expand on the findings of Basso et al. (2021) by evaluating the effects of a contextual play procedure on contextual play and joint attention skills of preschool aged children with ASD. Extending the procedure described by Basso and colleagues to younger children is an important contribution to joint attention research as the outcomes can inform methods for teaching joint attention to children with ASD at an earlier age, closer to the time when their typical peers acquire the skill. Further, teaching joint attention to preschool aged children with ASD, may have a collateral effect on social interaction, language development, and play skills (White et al., 2011). The present study asked the following research questions:

Research Questions:

1. What are the effects of modeling toy play on the contextual play behaviors of preschool aged children with ASD?
2. What are the effects of modeling toy play on initiating joint attention among preschool aged children with ASD?

METHOD

Participants

The participants included three children from the ages 4-to-5 years old with a medical diagnosis of ASD. Participants were eligible for the study if they met the following inclusion criteria: (1) demonstrated social orientation skills (per data collected by their Board-Certified Behavior Analyst (BCBA)); (2) were reported to have deficits in joint attention; (3) were reported to have deficits in contextual play skills; (4) had received ABA services for at least three months; (5) and were medically diagnosed for 30 hours of treatment a week. Social orientation is demonstrated when a child can orient towards a specific stimulus in the environment, such as a stimulus that is moving with eye gaze or body orientation. Inclusion criteria were put in place to accurately represent if there was progress through the intervention phase.

Brian was a 5-year-old Sudanese boy with a medical diagnosis of ASD. At the start of baseline, Brian demonstrated a limited expressive language repertoire and engaged in many stereotypical play behaviors such as lining up objects in a very particular manner. Brian did not demonstrate joint attention skills unless prompted.

Eli was a 4- year-old African American boy with a medical diagnosis of ASD. At the start of baseline, Eli engaged in little joint attention behaviors, but did engage in joint attention when given a prompt. Eli demonstrated very little contextual play skills and often engaged in inappropriate play with toys such as mouthing of items. He used a picture exchange communication system (PECS) as his primary means of functional communication. He often engaged in echolalia rather than functional speech.

Ally was a 5-year-old Caucasian girl with a medical diagnosis of ASD. At the start of baseline, Ally demonstrated little functional communication outside of her PECS and had low expressive language skills. She engaged in minimal joint attention unless prompted. Ally did not have strong contextual play skills and often engaged in stereotypical play behaviors such as repetitive use of items or lining up of objects.

Setting

All sessions were conducted in an ABA therapy room designed to replicate early childhood classrooms. There were eight children with ASD between the ages of 2- to 5-years-old and a therapist assigned to work with each child. Children received one-to-one therapy every weekday for a total of 32.5 hours of therapy a week.

Materials

There were three different boxes of toy sets that each had 10 toys inside. All the toys chosen were of the same complexity level to engage with, and developmentally appropriate. The boxes were rotated every session to increase the likelihood that the toys the child was accessing were engaging and fun. Toys within each box included light up toys, toys that spun, stuffed animals, transportation vehicle toys, dinosaurs that made noises, and educational toys with different letters and colors on them. There were chairs used for the child to sit in if they chose, data sheets, and an iPad to video record the sessions to collect reliability data.

Measurement of Dependent Variables

Contextual play was defined as any instance in which (a) the child imitated the toy play modeled by the experimenter (e.g., rocking the baby doll in arms) within 10 s of the model, or (b) playing with the toy in the manner that it was intended (e.g., pretending to feed the baby) within 10 s. Joint attention was defined as a response in which the child demonstrated eye

contact with the experimenter, gazed at the toy, and looked back at the experimenter or if the child gazed at the toy, at the adult, and then back at the toy. This interaction was recorded as successful if the eye contact was within 10 s of showing the child the toy. Each dependent measure was scored as occurring or not occurring on a trial-by-trial basis.

Inter-observer agreement (IOA) was conducted by two raters for 35% of the sessions (baseline, treatment, generalization probes). IOA was measured by the number of agreements divided by the sum of observations (e.g., agreements and disagreements) multiplied by 100 to yield a percentage (Basso et al., 2021). IOA was averaged at 93% across participants for joint attention engagements. An agreement for contextual play was defined as both raters indicating the same behavior for that given trial (either correct or incorrect response). It would be considered a disagreement if the observers recorded different data for correct and incorrect responses. IOA was averaged at 94% across participants for contextual play engagements.

The mean agreement for Brian's baseline was 100% (range, 100% to 100%) for contextual play behaviors and his mean agreement for joint attention was 100% (range, 100%-100%). The average agreement for Brian's intervention data was 94% (range, 70%-100%) for contextual play and 94% (range, 70%-100%) for joint attention with 33% of his sessions having IOA data. The mean agreement for Eli's baseline was 93% (range, 90% to 100%) for contextual play behaviors and his mean agreement for joint attention was 93% (range, 80%-100%). The average agreement for Eli's intervention data was 92% (range, 90%-100%) for contextual play and 92% (range, 90%-100%) for joint attention with 40% of his sessions having IOA data. The mean agreement for Ally's baseline data was 93% (range, 80% to 100%) for contextual play behaviors and her mean agreement for joint attention was 90% (range, 80%-100%). The average agreement for Ally's intervention data was 87% (range, 90%-100%) for contextual play

behaviors and 97% (range, 90%-100%) for joint attention with 33% of her sessions having IOA data.

Experimental Design and Procedures

A multiple baseline design across participants was used to examine the impact of the contextual play intervention on dependent variables. A multiple baseline design was chosen because the current study aimed to measure the effect of the intervention across multiple individuals. This design also allowed the experimenters to analyze each participant's data individually before transitioning from baseline to intervention. The criteria to move each participant from baseline to intervention was evaluated by the experimenter through visual analysis. The experimenter determined when to move the first participant from baseline to intervention once a steady baseline trend was obtained. The criteria to move the next participants into intervention was determined by the prior participant demonstrating one session of improvement after starting intervention. Contextual play behaviors were specifically used to make decisions on transitioning the participants from baseline to intervention.

The procedure consisted of baseline sessions, generalization probes, a contextual toy play intervention, and more play probes. The intervention remained consistent with the contextual play intervention for Brian and Ally. The intervention remained consistent for Eli with the following modifications. The experimenter observed Eli to focus on one specific item in each toy box and carefully attend to peers if they participated in the intervention in the therapy space before Eli. Therefore, prior to the fifth intervention session, the experimenter ensured Eli was the first to have an intervention session on any given day and provided less preferred items during early trials, withholding items thought to be more preferred for the later trials of a session.

Baseline

Baseline sessions began with an experimenter and the research participant in a play area inside of the treatment room. The experimenter had a box of 10 toys in which they reached into the box and presented the first item to the participant for 5 s at eye level. If joint attention was demonstrated during this time, it was recorded. The child was then given the toy for 10 s regardless of if joint attention occurred or not. The child could interact with the toy however they wanted during this time. Data were collected on joint attention and contextual play during the 10 s. After the child had 10 s with the toy, the experimenter took away the toy and moved on to the next trial. This process continued for 10 trials.

Contextual Toy Play Intervention

The purpose of the play intervention was to simulate typical dyad interaction play (Basso et al., 2021). The contextual toy play intervention was identical to that of baseline, except with the following modifications. The experimenter first held out one of the toys toward the participant at eye level for 5 s, allowing an opportunity for joint attention. After 5 s, the experimenter then modeled contextual play three different times. The child was then given the toy and had an opportunity to play with the toy in a contextual manner. Verbal prompts were delivered every 4 s. The prompts were statements such as: “You can play with it like this”, “Make the shark swim”, “You can make the cow jump” etc. Different phrases such as “My turn” and “Your turn” were used to encourage interactive play between the experimenter and the participant. This continued for 10 s with each toy. If joint attention occurred during the 10 s period, the child was reinforced with social praise, an edible reinforcer, and an additional 10 s to interact with the toy. Edible reinforcement was delivered if joint attention occurred at any point during the trial and was selected by a preference assessment to ensure the child was selecting

their preferred edible reinforcement. If the child did not engage in joint attention during the 10 s, the toy was removed, and the experimenter moved on to the next trial. If the child engaged in contextual play during the 10 s interactive play session, the child was reinforced with social praise.

Generalization

Play probes were identical to those of baseline, except they occurred with an adult unfamiliar to the child. There was no prompting that took place in the play probes. For each trial data were collected on joint attention and contextual play. Generalization probes were conducted during baseline and following completion of the intervention. The trial-based probes were conducted with a different adult to evaluate generalization of contextual play and joint attention skills with a BT who did not administer in the intervention sessions.

Procedural Fidelity

Procedural fidelity was measured to evaluate the extent to which the intervention was implemented as designed. Procedural fidelity was recorded for 30% of all sessions (baseline, treatment, play probes, generalization probes). Researcher behavior was evaluated based on a checklist (Appendix). The checklist measured if the correct procedure was implemented before, during, and after the session. Procedural integrity was calculated by dividing the number of correctly implemented steps by the total number of steps and multiplying by 100 (Basso et al., 2021). Procedural fidelity was rated with a mean of 100% (range, 100% to 100%) across all participants throughout the study.

RESULTS

Contextual Play

As shown in Figure 2, Brian engaged in contextual play for a mean of 65% (range, 60% to 70%) during baseline and a mean of 86.6% (range, 70% to 100%) during intervention. During baseline he demonstrated the ability to imitate what was being modeled by the experimenter or play with the toy in a different matter that was still considered contextual. Throughout the intervention he gradually increased level of contextual play, successfully engaging in contextual play for 100% of the time in the last two sessions of intervention. Brian generalized contextual play to another adult during the generalization probes during baseline and completion of treatment, with a higher level of generalization observed following intervention.

Eli's mean contextual play behavior was 22% (range, 10% to 30%) during baseline and 55% (range, 30% to 80%) during intervention. Eli demonstrated little contextual play skills beginning in baseline. He was engaging in many non- contextual play skills such as pushing the buttons on the toys repetitively or engaging in non-play behaviors such as mouthing when the toy was presented to him. During intervention, verbal prompts were added to the play as well as reinforcement for engaging in joint attention and contextual play. He began imitating how the experimenter was modeling contextual play for him, though progress was minimal across the first four intervention sessions. Eli was able to generalize contextual play skills to another person for the generalization probe following completion of intervention.

As shown in Figure 2, Ally demonstrated relatively high levels of contextual play during baseline, with a mean of 67.5% (range, 40% to 80%). These levels did increase during intervention, with a mean of 96.6% (range, 90% to 100%) during that phase. Throughout the

intervention phase, Ally made progress in her contextual play behaviors, but did not demonstrate her ability to generalize to a new adult.

Joint Attention

Brian demonstrated very few occurrences of joint attention during baseline sessions (Figure 3). He made immediate progress at the onset of intervention where vocal prompts were added every 4 s during play, an edible reinforcer was delivered, and extra time with the toy in addition to social praise for joint attention were given. As shown in Figure 3, Brian demonstrated a mean of 7.5% (range, 0% to 10%) during baseline and a mean of 41.1% (range, 20% to 50%) during intervention. In intervention, he increased from 10% independence in baseline to 40% in his first session in intervention. He continued to make significant progress throughout the nine sessions in intervention and consistently demonstrated joint attention at 50% independence for the last four sessions of the intervention phase. Brian was able to generalize this skill across another adult for the generalization probes during baseline and completion of intervention.

As shown in Figure 3, Eli demonstrated a mean of 38.3% (range, 30% to 50%) during baseline and a mean of 52.2% (range, 40% to 60%) during intervention. For the last six sessions of the intervention, he was independently engaging in joint attention on 50% - 60% of trials. He was able to successfully generalize this skill to a different adult in completion of the intervention and during the baseline generalization probe.

Ally demonstrated joint attention for a mean of 11.1% (range, 0% to 20%) during baseline and a mean of 23.3% (range, 10% to 40%) during intervention (Figure 3). Although this does not seem like a high level of independence, she showed slight progress throughout the intervention in her ability to demonstrate joint attention during play. Ally's generalization probe

following completion of treatment dropped from 40% independence from her last intervention session to 10% independence with a new adult.

DISCUSSION

The purpose of the present study was to assess the effects of modeling toy play, combined with reinforcement and vocal prompts, on contextual play behaviors and initiating joint attention behaviors of preschool aged children with ASD. The current study demonstrates that modeling play can increase contextual play skills in preschool aged children with ASD and that, in some situations, joint attention can also be increased through modeling contextual play. The first participant, Brian, demonstrated progress in both joint attention and contextual play through intervention. Eli and Ally demonstrated a slight increase in joint attention skills and demonstrated progress of contextual play skills throughout intervention. Brian and Eli demonstrated generalization of skills to another adult following completion of the intervention. Ally demonstrated a decrease in percentage of independence from the last session in intervention to the generalization probe but had demonstrated deficits in generalization consistently throughout ABA treatment (per data collected by her BCBA).

Eli was the youngest participant in the study (4 years old) and demonstrated the least amount of play skills prior to the current study. He also demonstrated the least amount of expressive and receptive language skills at the beginning of baseline. Ally was 5 years old and demonstrated very little expressive language at the beginning of baseline, and often engaged in stereotypical play behaviors such as repetitive use of items or lining up of objects. Brian was 5 years old and demonstrated the most progress through intervention in joint attention. Brian also displayed the most amount of language and communication skills of all the participants prior to the study. Based on the results of the current study, developmental age could be a factor in the progress participants will make in joint attention through an intervention like the current one.

In the study conducted by Basso et al., (2021), all three of the participants demonstrated an increase in contextual play and joint attention skills. In the current study, all three participants had made progress from baseline to intervention in contextual play skills and one of the three participants made clear progress in joint attention. The successful contextual play results of the three participants support the efficacy of the contextual play intervention to improve play skills in preschool aged children with ASD. All three of the participants in the Basso study demonstrated generalization in both joint attention and contextual play during the generalization probes, whereas two out of three participants demonstrated generalization to a different adult in the current study. Basso et al., (2021) supported the efficacy of a contextual play intervention for increasing joint attention in school aged children with ASD, whereas the current study sought to find the same results in preschool aged children with ASD.

In the current study, reinforcement was given in the form of social attention and access to the toy when joint attention occurred. After the experimenter presented the toy to the child at eye level, the experimenter would model toy play for the child three times. Joint attention seemed to have come naturally when the experimenter was modeling how to play with the toy. The child would typically look at the toy, back at the adult, and then back at the toy to see how the experimenter was interacting with it. Edible reinforcement was delivered contingent on joint attention, and the experimenter provided access to the toy as well. If the child then interacted with the toy in a contextual manner, more social attention and interaction with the experimenter was given, making this a very naturalistic and interactive way to teach both skills. One thing to consider is why joint attention increased through the intervention for Brian, but not Ally and Eli. The answer may depend on the age of the participant as well as the language skills they have prior to the study. Future researchers could look to replicate this study with preschool aged

children. The current study did not demonstrate results as successful as Basso et al., (2021) with school aged children regarding joint attention. Brian demonstrated the most advanced language repertoire of all the participants in the current study. Brian also displayed the least amount of joint attention in baseline and made the most progress throughout the intervention. An intriguing topic for future researchers would be to assess if a more advanced language repertoire is a pre-requisite skill for children with ASD to increase joint attention through a play intervention.

Previous joint attention interventions support the efficacy of using play to teach joint attention, but before the Basso et al., (2021) study, research had not assessed the efficacy of modeling toy play as the context to develop joint attention. Play creates a natural opportunity for the child to access reinforcement by engaging with another person whether that is a peer, a parent, etc. The current study expanded on that research, by modeling toy play to teach joint attention in preschool aged children.

Previous studies have supported the hypothesis that joint attention can be taught to children with ASD through prompting, social contingencies, multiple examples, and reinforcement (Gomes et al., 2020; Hansen et al., 2018; Rozenblat et al., 2019; Taylor & Hoch 2008). However, typical children appear to acquire joint attention through interactions with adults that are more developmentally oriented, such as during play or naturally occurring interactions in real world scenarios (Taylor & Hoch, 2008). Basso et al., (2021) successfully taught three children with ASD joint attention through a contextual play intervention, demonstrating that joint attention can be taught through play to children with ASD. In the current study, only one of the three participants demonstrated progress in joint attention. The participants in the Basso et al., (2021) study were older than the current study's participants (between 7 and 8 years old). Brian was the only participant in the current study to display an increase in joint

attention. Brian also demonstrated more developed receptive and expressive language than Ally and Eli. As Thiemann-Bourque et al., (2019) stated, with typically developing children and children with ASD, the onset of higher-level language skills has been shown to increase the emergence of more symbolic play compared to those with less developed language skills. Developmental age may have played a large part in the results of the current study.

Joint attention was not a brand-new skill to any of the participants in the current study. All three of the participants demonstrated some degree of joint attention skills during baseline. This study aimed to increase joint attention through the play intervention. In the future, researchers could potentially use joint attention as a pre-requisite skill that is in the child's repertoire prior to using a play intervention to try and increase joint attention.

Limitations

There are multiple limitations to the current study. First, the procedures for Eli were minimally altered during the intervention phase. The experimenter had observed Eli focusing on one specific item in each toy box and carefully attending to peers that participated in the intervention before him. Prior to the fifth intervention session, the experimenters ensured that Eli was the first to have an intervention session on any given day and withheld more preferred items for later trials of the session. Changing the procedures during intervention for Eli, adds a potential confounding variable. Because there are many components, experimenters cannot identify what made the intervention successful for this participant.

Another limitation to the current study is that two of the three participants demonstrated minimal gains in joint attention despite receiving the intervention. This contrasts with Basso et al., (2021) which demonstrated successful results across all three of the participants. The conflicting results could be because of the age of the participants. The one participant who did

show success in joint attention results in the current study was 5 years old and demonstrated a more advanced language repertoire than the other two participants.

A third limitation to the current study is the multi-component intervention. There were many variables included during intervention such as modeling toy play, social reinforcement of joint attention and contextual play, and an edible reinforcement when joint attention occurred. Because there were multiple variables it is unclear which components are essential for the results obtained.

Generalization was only assessed once during baseline and once following the completion of intervention. It could be beneficial for future researchers to run multiple generalization probes throughout the study to thoroughly assess if skills were generalizing to a different person and a different setting. The current study only conducted generalization probes with a different adult. Assessing generalization with a different adult as well as in a different setting to ensure that responses of joint attention and contextual play are generalizing beyond the treatment room and person will be beneficial for future studies.

Another limitation to the current study is that the toys that were used for the study were chosen by the experimenter. Any variability in performance could be due to a specific box of toys being more reinforcing than another box. For example, if Box 2 had more toys that Eli was interested in, his joint attention percentage of independence could have been higher than it was for Box 3 where he was not as interested in the toys in that box. The preference of which toy box was used could have affected the overall outcomes of the study.

Future Research

Because of there were so many components during intervention, a suggestion for future researchers would be to use a component analysis study. This experimental design would help

researchers identify the essential variables of the intervention to determine which element was affecting behavior change (Cooper et al., 2020).

Future researchers could identify a more systematic way to ensure that all the toys are of a similar preference level for the child. This way the data does not reflect bias when it comes to preference of the toys for each participant. Future researchers could use preference assessments such as a multiple stimulus without replacement (MSWO), before conducting the study to evaluate which toys will be most reinforcing to the specific participant.

Lastly, researchers should consider maximizing the need for generalization. This will require a thoughtful and systematic way to prioritize the skills that will be required of the learner in the future. To do this, future research should look to assess generalization in settings and across people that will be the most beneficial to the learner and consider where they will benefit most from using those skills (Cooper et al., 2020). In the current study the participants were ages 4 and 5 years old, therefore, teaching in a setting that they may be in and with peers they will be around in the future will be valuable. Potentially looking to teach these skills with siblings or parents that they will engage with frequently would be beneficial as well. Teaching in a setting such as the child's home or in another classroom with peers could also be something for future researchers to keep in mind when teaching to generalization in a different setting.

CONCLUSION

The development of joint attention skills can be delayed for children with ASD compared to typically developing children. Joint attention and play are pivotal skills that can lead to the emergence of other skills such as language and communication, play, and social skills. This study demonstrates that, in some cases, joint attention and play can be taught concurrently, saving precious time in the student's education experience. Teaching joint attention through the context of play can aid children with ASD in grasping the richness of social experiences with others. Basso et al., (2021) demonstrated the efficacy of teaching joint attention skills through a contextual play intervention in school aged children (7-8 years old), leading to the present study of teaching joint attention through a contextual play intervention in preschool aged children (4-5 years old). The more we know as behavior analysts on how we can increase joint attention and play skills through a naturalistic form of play, the more effective we will be in guiding children with ASD to connect with those around them and to a more independent life.

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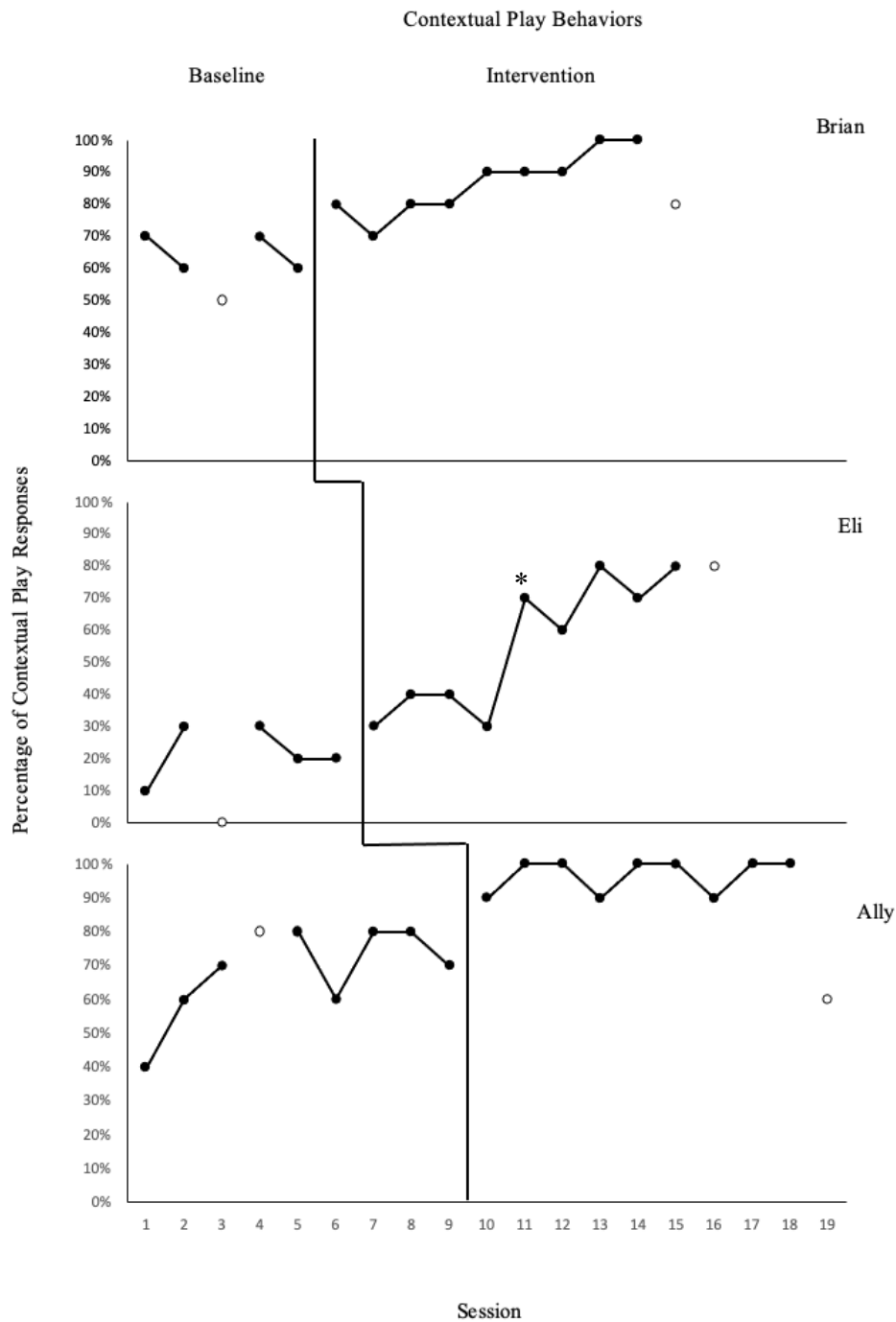
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APPENDIX **PROCEDURAL AND FIDELITY CHECKLIST**

Date:	Student:	Interventionist:	Observer:	Session:
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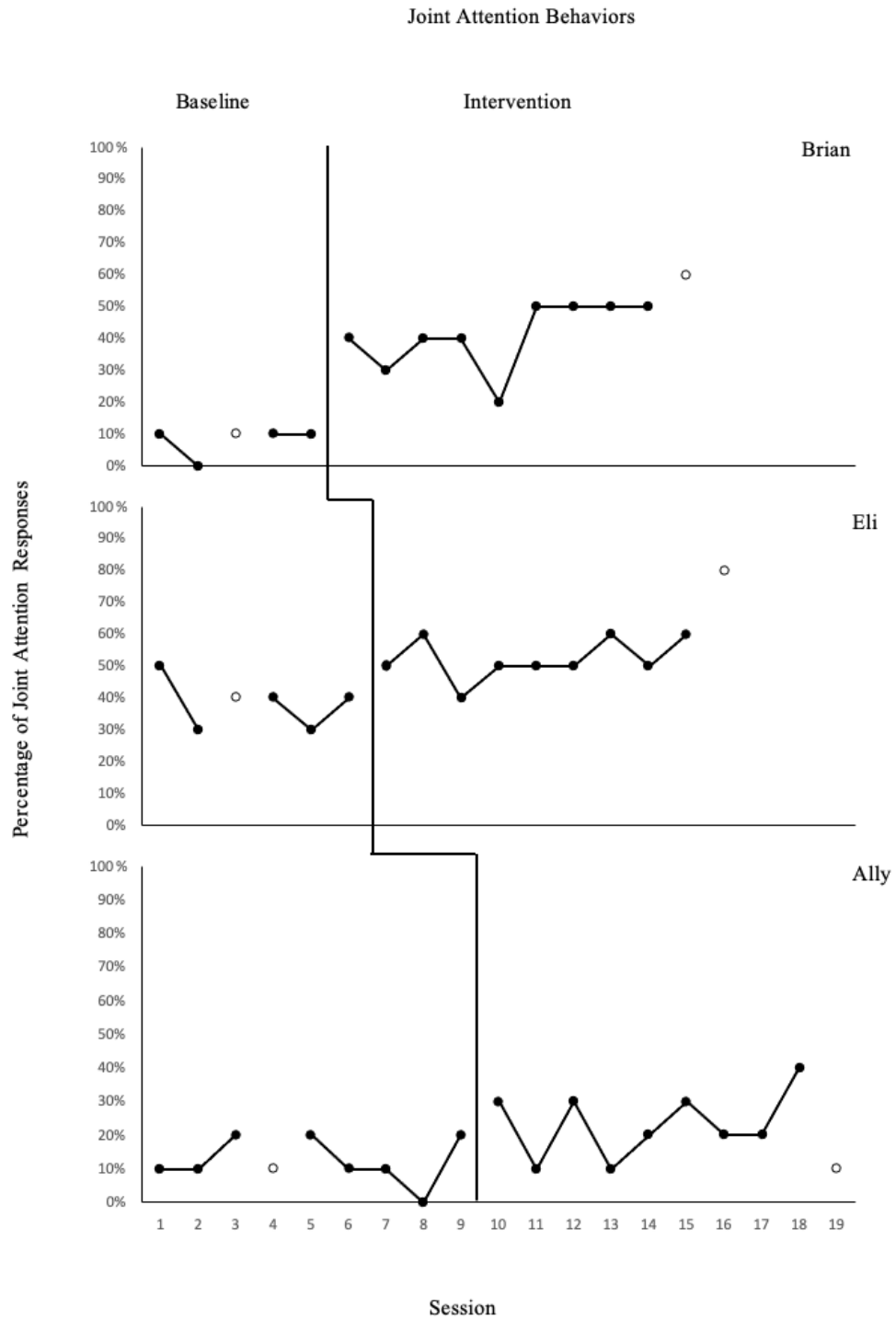
	Yes	No	N/A
Prior to session:			
1. Materials are accessible to researcher and/or participant (i.e., camera for recording, toy sets, data sheets, pen, stopwatch)			
During Session:			
2. Experimenter presents toy at eye level for 5 seconds			
3. Experimenter modeled contextual play 3 times			
4. Child is given opportunity to engage with the toys for 10 seconds			
5. During intervention, verbal prompts occur by experimenter every 4 seconds, such as "Make the dinosaur stomp!"			
6. Experimenter did not use verbal prompts during baseline and probe sessions			
7. Experimenter did not use social or edible reinforcement during baseline and probe sessions			
8. If joint attention occurs, proper reinforcement was given (extra time with the toy, social praise, edible) / If joint attention did not occur, experimenter moves on to next trial			
9. To conclude a trial, the experimenter says, "My turn", takes the toy, and begins next trial			
After session:			
10. Data was taken and coded correctly			

FIGURE 1
CONTEXTUAL PLAY



Note. Figure 2 depicts contextual play behaviors across participants. The open circles represent the generalization probes that took place in baseline and following completion of treatment.

FIGURE 2
JOINT ATTENTION



Note. Figure 3 depicts joint attention behaviors across participants. The open circles represent the generalization probes that took place in baseline and following completion of treatment.