

INCREASING PLAY VARIABILITY IN CHILDREN WITH AUTISM SPECTRUM
DISORDER

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Applied Behavior Analysis – Master of Arts

2024

ABSTRACT

Children with autism spectrum disorder (ASD) often engage in restrictive or repetitive behaviors, including engaging in repetitive forms of play. Play skills are imperative to children's cognitive, physical, and emotional well-being, and help foster connections with peers. Interventions targeting variability of play are therefore critical for children with ASD to increase problem solving, creativity, and encourage relationships between peers. The current study seeks to examine the effects of a Lag 1 schedule on play variability (i.e., block variability). Results and implications are discussed.

Keywords: behavior variability, Lag schedule, autism spectrum disorder

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INTRODUCTION

Restrictive and repetitive behaviors (RRBs) are one of the diagnostic criteria of ASD (American Psychiatric Association, 2013). RRBs can affect several domains, such as play (Galizio et al.; Napolitano et al., 2010). Research has demonstrated increased variability in behavior can reduce RRBs (Beglinger and Smith, 2001) which can reduce a lack of reinforcement provided for repetitive responding (Brodhead et al., 2016). While not every individual diagnosed with ASD engages in RRBs variability in behaviors, especially play, has been shown to increase positive relationships between peers, thus leading to increases access to social reinforcement (Hart Barnett, 2018).

One of the earliest examples of applied research on variability is Goetz and Baer's 1973 study with typically developing children. The study aimed to increase varied block forms, defined as a form that had not been seen in that specific session, by implementing differential reinforcement while monitoring new forms (Goetz & Baer, 1973). Block form variability increased during the differential reinforcement condition (Goetz & Baer, 1973). Additionally, increases in behavioral variability of play skills were observed via new forms as the sessions progressed indicating that differential reinforcement is an effective strategy for teaching varied play skills (Goetz & Baer, 1973).

Napolitano and colleagues (2010) expanded on the research conducted by Goetz and Baer (1973). Participants were elementary-aged children with ASD rather than typically developing preschool-aged children. Instead of using differential reinforcement, Napolitano et al. used what is referred to as a Lag x schedule of reinforcement, whereas reinforcement is provided if the response differed from a specified number, or x , of previous responses along a specific dimension (Cooper et al., 2020). Two different variables were measured at baseline, variant color

and variant form with authors implementing the intervention on the variable the participant scored lower on during baseline (Napolitano et al., 2010). Results suggest that reinforcement can increase play variation; however, some individuals may require teaching of the schedule's requirement for reinforcement in order to increase variation.

An additional example of researchers using a Lag schedule of reinforcement to Increase variable play behavior is Galizio and colleagues (2020). Galizio et al. (2020) examined the effects of a Lag schedule of reinforcement on variable play behaviors along with novel play behaviors with playsets and figurines. Play variability, as well as novel play actions, increased as a result of the Lag 1 schedule (Galizio et al., 2020). Galizio and colleagues (2020) demonstrates Lag schedules of reinforcement can increase variability of a multitude of play actions, and promote increases in novel play behaviors.

The current study seeks to extend on the research conducted by Napolitano and colleagues (2010) by examining the effects of a Lag 1 schedule of reinforcement on block variability preschool-aged children with ASD. Further, the current study aims to evaluate the effects of the Lag 1 schedule of reinforcement on novel play behaviors.

METHOD

Participants

Participants included one girl and three boys from a university based early intensive behavior intervention (EIBI) classroom. Participants had a medical diagnosis of ASD, were between the ages of three and five years old, and attended the EIBI clinic for 30 hours each week. Prerequisite skills the participants engaged in included fine motor skills, learner readiness responses (e.g., sitting in a chair, quiet hands), and basic play skills (i.e., building with blocks). Participants also engaged in limited problem behavior (e.g., low levels of property destruction, elopement, and aggression) and had a history of consenting to the use of physical prompts. Prerequisite skills and levels of problem behavior were identified through observation by the primary researcher.

Participant 1 was Michael, a 4 year old boy who was diagnosed with ASD. Michael had been receiving ABA services at the clinic for 6 months. Participant 2 was Soren, a 3 year old boy who was diagnosed with ASD. Soren had been receiving ABA services at the clinic for 13 months. Participant 3 was Dimitri, a 3 year old boy who was diagnosed with ASD. Dimitri had been receiving ABA services at the clinic for 3 months. Participant 4 was Anna, a 3 year old girl who was diagnosed with ASD. Anna had been receiving ABA services at the clinic for 15 months. All participants identified as white and were non-Hispanic.

Settings and Materials

Study sessions were conducted in a quiet area of the EIBI classroom with minimal distractions. Participants sat at a table (48.2 cm H by 76.2 cm L by 53.3 cm D) with a chair across from the primary researcher. Under the table, the primary researcher had an opaque bin filled with 12 red, eight peg blocks (2.54 cm H by 6.35 cm L by 3.17 cm D). Three 25.4 cm by

25.4 cm brick building baseplates were used throughout the study to distinguish between conditions. A gray baseplate was used in baseline and a blue baseplate was used in the Lag 1 condition. A random number generator was used prior to each session (Haahr, n.d.). A handheld camera with a tripod was used to record experimental sessions for later scoring. Preferred edibles as indicated by the preference assessment (described in more detail below) were made available during the conditions as putative reinforcers.

Dependent Measures

The primary dependent variable was number of varied block forms per session. A varied block form was defined as any block form that differed from the previous form based on block position and/or direction of the form. A block form was defined as any formation in which the blocks are touching (e.g., on top of each other or next to each other). In total, there were 130 different forms that could be constructed by the participants including a cross, steps, and an L-shape (See Appendix A). Given that each session consisted of 10 trials (opportunities) to construct a block form, a count measure was calculated by simply adding the sum of varied forms for each session.

A secondary dependent variable was novel forms, defined as a block form that had not yet been observed in any previous research sessions for that specific participant. Novel forms were tracked through a cumulative count throughout the study.

Design and Procedure

A withdrawal design was used to evaluate the effects of a Lag schedule of reinforcement on different forms (Ledford & Gast, 2018).

Multiple Stimulus Without Replacement

Prior to baseline, a multiple stimulus without replacement preference assessment (MSWO) was conducted in order to evaluate participants' preference for edible stimuli. The primary researcher followed the procedures described in DeLeon and Iwata (1996) to administer the MSWO. Ten edible items were identified by the participant's Board Certified Behavior Analyst (BCBA) to use in the MSWO. Stimuli were then randomly placed in a straight line on a table approximately 5 cm between each. The primary researcher sat on one side of the table across from the participant. The primary research then stated, "Pick one." Once the participant made a selection, they were allowed to consume the edible and the chosen stimulus was not replaced. If no edible was selected by the participant within 30 s of the start of the trial or the item was not consumed, the MSWO session was completed and all remaining items were reported as "not selected." Before beginning the next trial, the primary researcher rotated the remaining stimuli by taking the item on the left end and moving it to the right, then shifting each of the other stimuli to the left. This process continued until all stimuli had been selected. These procedures were repeated five times, during which the primary researcher recorded the number of times an edible item was selected (i.e., one for the first item, ten for the last item). Edible preference was determined by adding the number of times the stimulus was selected, then dividing by the number of time the stimulus was presented, and multiplying by one hundred (Higbee, 2009)

Before each session, a brief MSWO was conducted to identify which edible item would be used during that session (Carr et al., 2000). Procedures were conducted in the same way as Brodhead et al. (2016). The items used in the brief MSWO were informed by stimuli identified in the first MSWO assessment. However the brief MSWO ended after the participant selected

three items. These three items were then used during the sessions to account for changes in participant preference.

Baseline

Prior to each session a random number generator was used to select a block form from a predetermined list (Appendix A) in order to serve as a point of reference for the first participant response. After then conducting a brief MSWO, the primary researcher sat across from the participant and the orientation of materials are described from the participant's point of view for all procedures. The prebuilt form selected by the random number generator was placed on the right baseplate and two separated blocks were placed on the left baseplate. Then, the primary researcher stated, "Build something." The participant then had the opportunity to build a block form on the baseplate provided. Reinforcement was provided during the baseline condition for all builds. Once the participant built a block form, the primary researcher removed the block form on the right side of the gray baseplate and disassembled it out of sight from the participant. The participant-built form then replaced the form that had been removed. Two more individual blocks were placed on the gray baseplate (see Figures 1 through 4). If the participant did not build a block form, the blocks were represented and the primary researcher restated, "Build something." This process continued until ten trials had been completed.

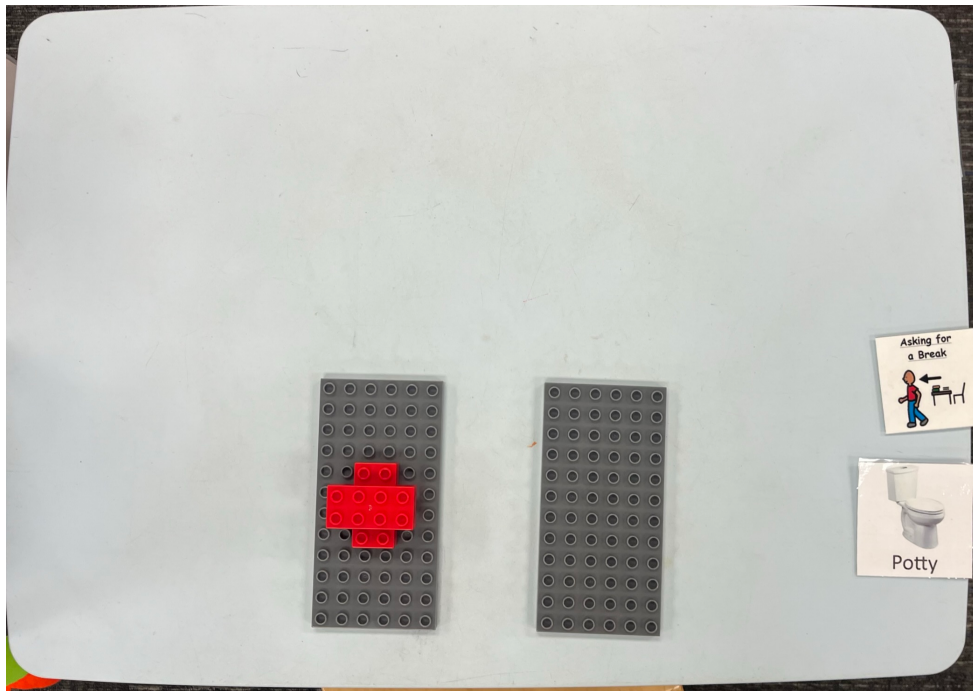


Figure 1 Prebuilt form on left baseplate

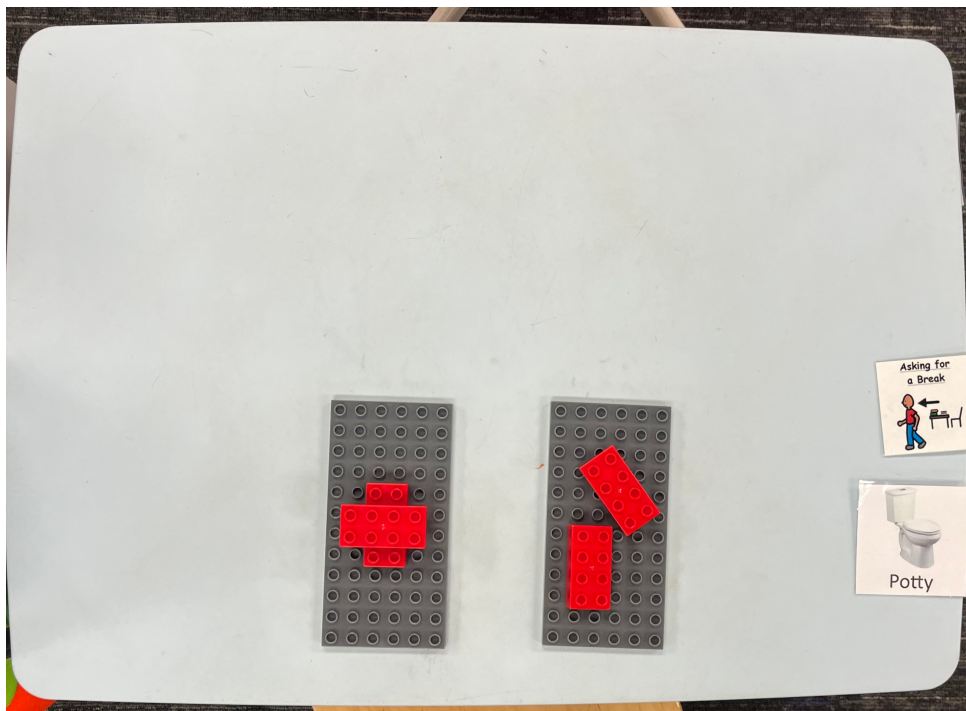


Figure 2 Two individual blocks on the right baseplate

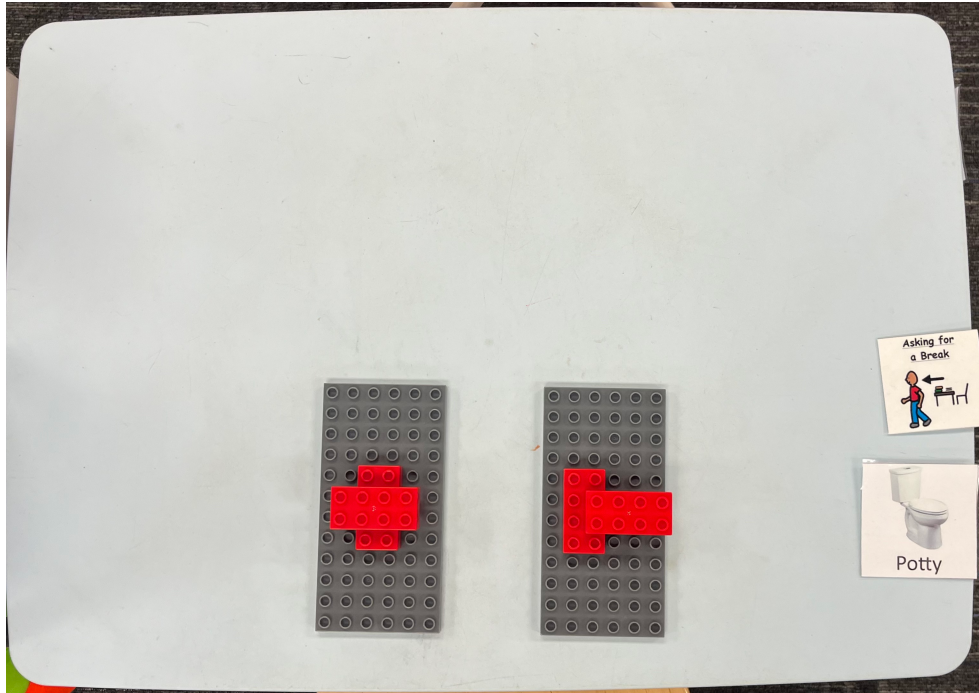


Figure 3 Participant built form on the right baseplate

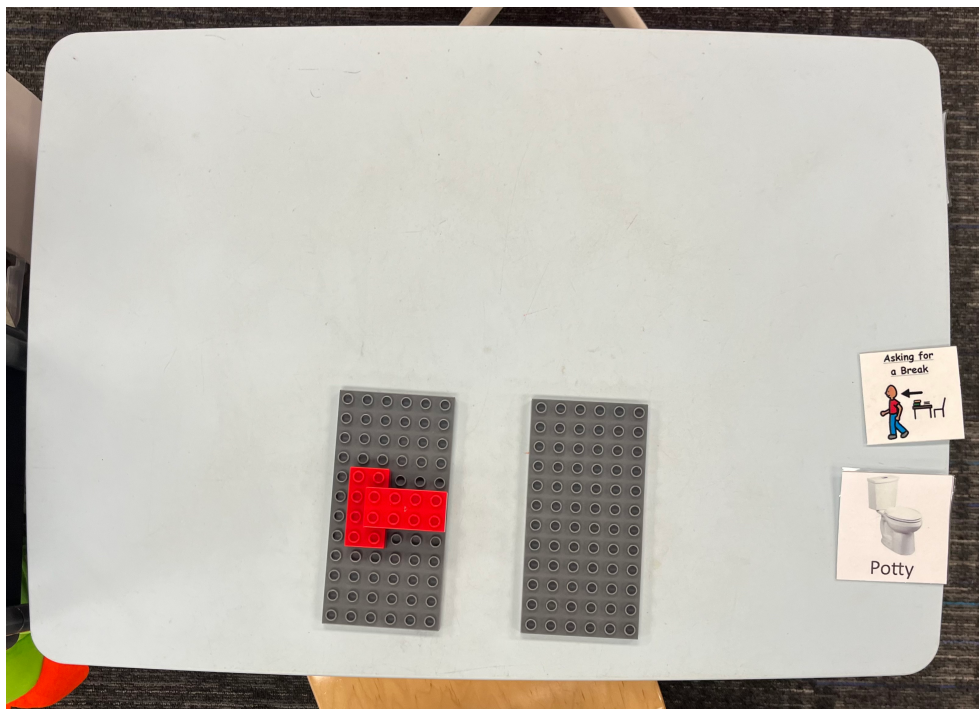


Figure 4 Participant built form placed on the left baseplate

Baseline No Reinforcement (Participant 1 Only)

This condition was the same as baseline; however, the brief MSWO was not conducted prior to the participant sitting at the table. The participant did not access a putative reinforcer for any builds created during the session.

Baseline No Reinforcement with Modified Direction (Participant 1 Only)

This condition was the same as the previous baseline no reinforcement condition, however, the direction given to the participant changed. Rather than saying “Build something,” the direction was modified to “Build the same.”

Lag 1 Condition

Following baseline, the participants were exposed to the Lag 1 condition. Procedures were conducted in the same manner as in baseline; however, a blue baseplate was used, and reinforcement was provided on a Lag 1 schedule of reinforcement. When the block form on the right side of the blue baseplate differed from the block form on the left side of the blue baseplate the primary researcher stated, “Good, that’s different!” and provided an edible item identified in the preference assessment conducted prior to the start of the session. If the response did not vary from the previous response or no response occurred, the edible item was not provided and the primary researcher stated, “Ok.”. Regardless of whether or not the block form was scored as varied, the prebuilt form was removed and replaced by the participant-built form. The participant was then provided with another opportunity to build a form. This process continued until ten trials had been completed.

Teaching Trials

All participants exposed to the Lag 1 condition did not increase variability as a result of the Lag 1 schedule; therefore, teaching trial sessions were conducted. Soren and Dimitri were

exposed to three teaching sessions and Anna was exposed to four teaching sessions. During teaching trial session, the participants were full physically guided to build a varied form during each trial. Immediately following each trial, vocal praise and an edible putative reinforcer were provided

Procedural Fidelity

An independent observer used checklists, developed by the primary researcher, to collect procedural fidelity data (Appendix B). Mean procedural fidelity was calculated by adding all procedural fidelity percentages together and dividing by the number of sessions to yield a percentage (Ledford & Gast, 2018). Mean procedural fidelity for Michael was 100%. Mean procedural fidelity for Soren was 99.25% (range 85.7% to 100%). Mean procedural fidelity for Dimitri was 100%. Mean procedural fidelity for Anna was 98.57% (range 85.7% to 100%). Procedural fidelity was collected for 33% of sessions across all conditions.

Interobserver Agreement

Interobserver agreement data was collected for 33% of randomly selected baseline, teaching, and treatment sessions for each participant in each condition. The primary researcher and an independent observer viewed the recorded experimental sessions. An agreement was defined as both observers scoring a trial as varied or not varied. A disagreement was defined as the observers scoring a trial as varied or not varied differently. Percent agreement was calculated by dividing the number of agreements by the number of disagreements plus agreements and then multiplying by 100 to yield a percentage (Ledford & Gast, 2018). Mean agreement for Michael was 93.75% (range 70% to 100%). Mean agreement for Soren was 97.37% (range 70% to 100%). Mean agreement for Dimitri was 98.82% (range 80% to 100%). Mean agreement for Anna was 98% (range 90% to 100%).

RESULTS

Participant 1

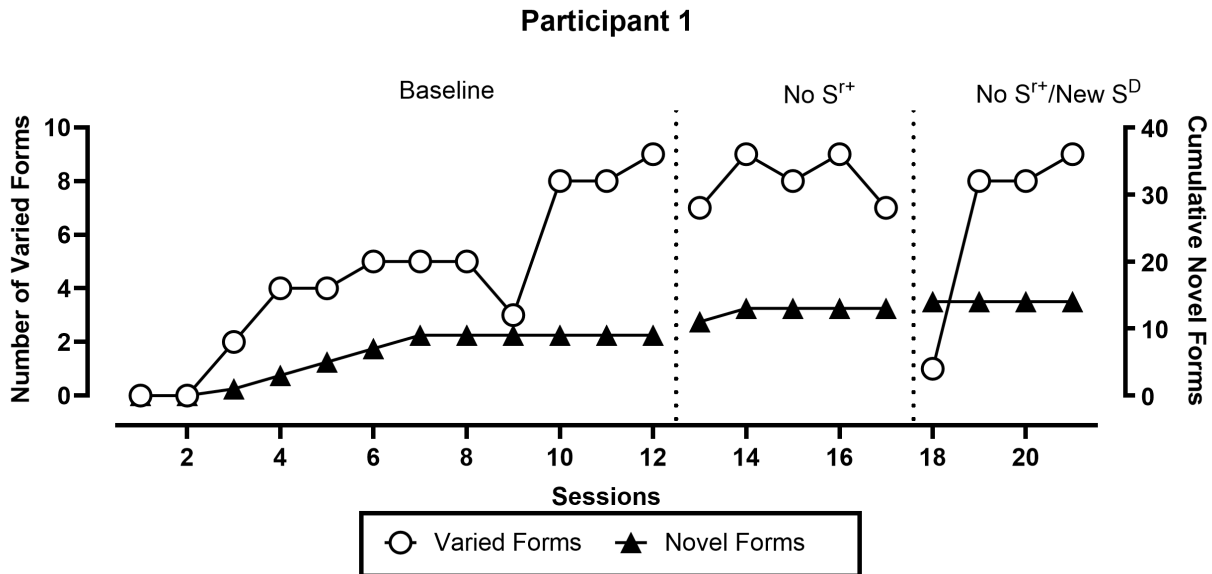


Figure 5 Michael's number of varied forms per session and cumulative novel forms per session

Baseline

Michael's baseline variability ranged from zero forms to nine forms. During the first two sessions Michael built zero varied forms. During sessions three and four, Michael increase to three varied forms and five varied forms respectfully.

Baseline No Reinforcement

During the baseline with no reinforcement condition, Michael's block form variability ranged from seven to nine.

Baseline No Reinforcement with Modified Instruction

In the baseline with no reinforcement with a modified instruction condition Michael's block form variability ranged from one to nine. During the first session Michael only built one varied form. After the first session, Michael built eight varied forms for two consecutive sessions and nine varied forms for the last session in this condition. The participant was then removed

from the study because the baseline level of variability was too high to observe changes with the Lag schedule of reinforcement.

Figure 6 Michael's cumulative novel forms per session

Novel Forms

In total, Michael engaged in 14 novel forms throughout all of the conditions. A total of nine varied forms were built during the initial baseline condition. In the baseline with no reinforcement condition four additional varied forms were constructed. One novel form was constructed during the baseline with no reinforcement with a modified instruction condition.

Participant 2

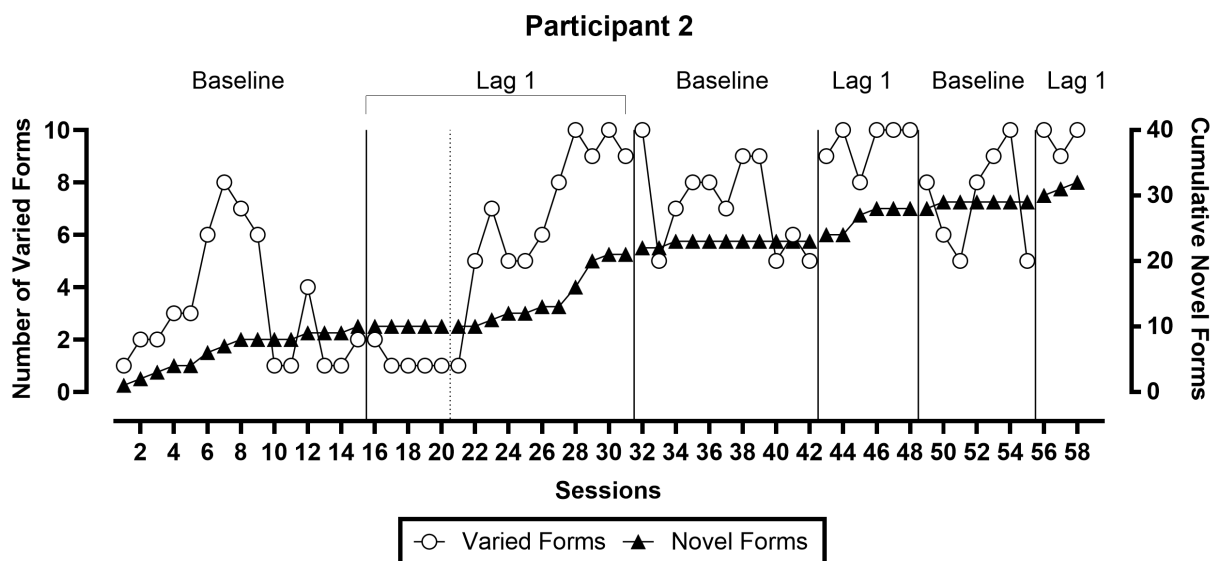


Figure 6 Soren's number of varied and cumulative novel forms per session

Baseline

During baseline, Soren's variability ranged from one to eight. During the first six sessions Soren engaged in low rates of variability ranging from one to three varied forms per session. An increase in variability was observed during sessions six through nine with a range of

six to eight varied forms. A decrease in variability was subsequently observed during sessions 10 through 15 with a range of one to four varied forms.

Lag 1 Condition

Soren engaged in low rates of variability for five sessions. He engaged in two varied forms during the first session and one varied form for the remaining four sessions, at which point he was exposed to teaching sessions. After the teaching sessions, Soren's variability ranged from one to ten forms per session. Soren only engaged in one varied form during the first session after exposure to teaching; however, increases were observed following this session.

Baseline

When returning to baseline Soren engaged in moderated to high levels of variability, ranged from five to ten. Soren's responding in baseline was variable; however, the last three sessions conducted resulted in five to six varied forms.

Lag 1 Condition

Soren's responding in the Lag 1 condition increased from the previous baseline condition with a range of eight to ten varied forms per sessions.

Baseline

Soren continued to engage in moderate to high rates of variability in baseline ranging from five to nine varied forms per session. These rates of responding were similar to rates observed in the first return to baseline.

Lag 1 Condition

In the third Lag 1 condition Soren continued to engage in high rates of variability ranging from nine to ten varied forms per session.

Novel Forms

Soren engaged in 32 novel forms throughout all of the conditions. In the initial baseline condition Soren constructed ten novel forms. Prior to teaching Soren did not construct any novel forms; however, after teaching sessions were conducted 11 novel forms. Soren then returned to baseline where he only built one novel form. In the second Lag 1 condition, Soren constructed five novel forms. Once Soren returned to baseline only one novel form was built.

Participant 3

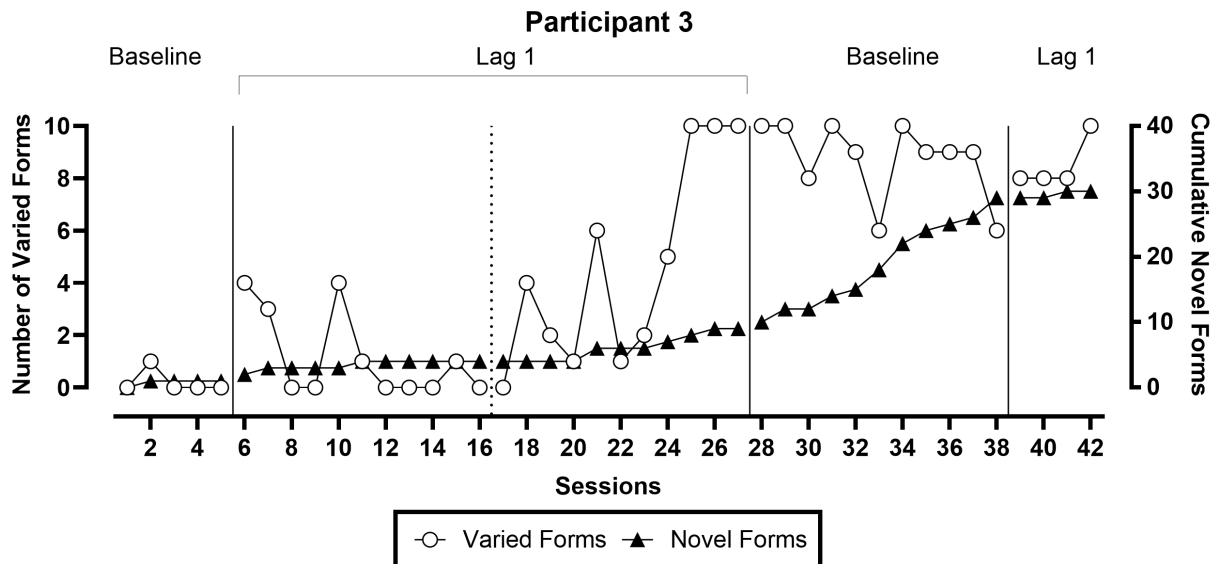


Figure 7 Dimitri's number of varied and cumulative novel forms per session

Baseline

During baseline, Dimitri, engaged in little to no variability. In sessions one, three, four, and five Dimitri did not engage in any varied responses; however, during the second session Dimitri engaged in one varied form.

Lag 1 Condition

During the Lag 1 condition Dimitri engaged in low to moderate rates of variability ranged from zero to four varied forms per session. Dimitri showed an initial increase from baseline

during the first two sessions in which he responded with four and three varied forms respectfully. After the two initial sessions, Dimitri exhibited a decrease in varied responding with zero varied forms for two sessions. During session ten Dimitri engaged in four varied forms again; however, during all subsequent sessions he engaged in low rates of variability similar to baseline. At which point Dimitri was exposed to teaching sessions. After teaching sessions, Dimitri engaged in low to high rates of variability with a range of zero to ten varied forms.

Baseline

Dimitri continued to engage in moderate to high rates of variability when exposed to the baseline condition again ranging from six to ten varied forms per session. While Dimitri continued to vary at moderate to high rates the variability of the data itself was more variable.

Lag 1 Condition

In the second Lag 1 Condition Dimitri continued to vary at high rates ranging from eight to ten varied forms per session.

Novel Forms

In total, Dimitri engaged in 30 novel forms. During the initial baseline condition Dimitri built only one novel form. Prior to teaching Dimitri constructed three varied forms; however, after teaching he built four novel forms. Dimitri constructed 20 novel forms when he returned to the baseline condition.

Participant 4

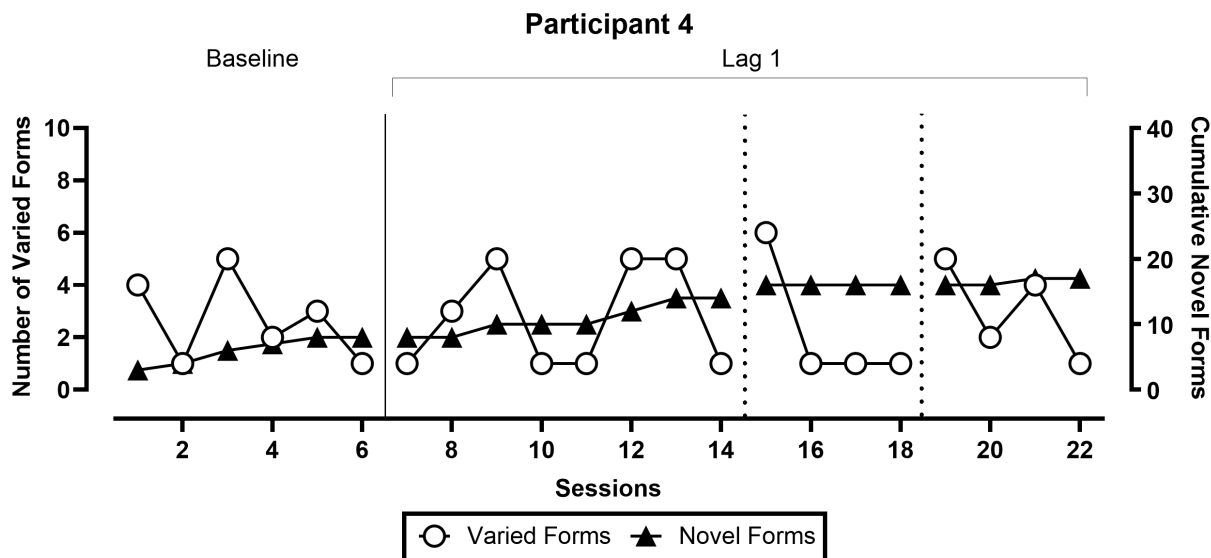


Figure 8 Anna's number of varied and cumulative novel forms per session

Baseline

During baseline, Anna engaged in low to moderate rates of variability, ranging from one to five varied forms.

Lag 1 Condition

During the Lag 1 condition, Anna continued to engage in low to moderate rates of variability, similar to rates observed in baseline. Anna was subsequently exposed to teaching sessions. After exposure to teaching sessions, Anna exhibited an increase in variability with six varied forms; however, decreased to one varied form for the following two sessions. Another teaching session was conducted; however, following this session Anna continued to vary at rates similar to baseline. Anna subsequently then dropped from the study because it was hypothesized she had met her ceiling of responding.

Novel Forms

In total, Anna engaged in 17 novel forms throughout all of the conditions. During baseline, Anna constructed eight novel forms. Prior to teaching sessions Anna built six novel forms. After teaching sessions, Anna only constructed three novel forms.

DISCUSSION

A Lag 1 schedule of reinforcement may not be enough to increase variability of play behaviors in preschool-aged children with ASD. However, this finding could be due to an unfamiliarity with the schedule's requirements to access reinforcement. While contingencies to vary occur naturally, the Lag 1 schedule of reinforcement generally does not. Therefore, teaching the schedule's requirements may aid in increasing variability of block building behaviors in children with ASD, as evidenced by Soren and Dimitri. These findings align with those reported by Napolitano and colleagues (2010) in which participants were exposed to teaching sessions after the Lag 1 schedule alone did not increase variability.

Michael and Soren displayed increases in variability during baseline, whereas Dimitri and Anna showed steady rates of responding in baseline. A potential explanation for Michael and Soren's increase of variability includes the extended exposure to baseline intended to reach a steady state of responding. In Michael's case it is suspected that the extended exposure to baseline may have allowed for a verbally mediated rule to influence behavior, rather than the contingencies within the condition. The rule would have required Michael to build a varied form during each trial. We evaluated this hypothesis by exposing Michael to modified baseline conditions, in which no reinforcement and a modified instructions were provided. In both modified conditions Michael continued to respond at high rates of variability. Therefore future research should evaluate the extent to which rule-governed behavior effects variability.

We made the decision to reinforce every response during baseline with the assumption that participants would engage in repetitive block formation due to our hypothesis that repetition was less effortful than varied responding. One unintended effect of reinforcing every form in baseline is maturation (i.e., learning) as a function of extended exposure to the condition. For

Michael, this extended exposure allowed for the potential creation of a verbally mediated rule in which he was required to vary during each trial in a session. Another unintended effect of reinforcing every form in baseline occurs during the withdrawal phase. Soren and Dimitri both achieved the ceiling of responding during the Lag 1 condition: therefore, accessing reinforcement after each build. When the withdrawal occurred they continued to access reinforcement after each build; however, the requirement for reinforcement was only to build any form, resulting in high rates of variability in the withdrawal. A potential alternation would be to remove all reinforcement during baseline conditions or only reinforcing non-varied (repetitive) forms in baseline.

Soren also exhibited a pattern of responding during sessions of one varied form in which he consistently varied the first trial building the same form each time. This form was one block directly next to another block on the baseplate (See form 93 in Appendix A). This pattern of responding could be explained in terms of response effort, where we observed that Soren pushed blocks down on the baseplate without picking them up to place them. The definition of block form within the context of this study was defined as any formation in which the blocks are touching including on top of each other or next to each other. Due to the blocks being able to touch in any way participants were able to push the blocks directly on the baseplate resulting in low effort repetitive responding. An adjustment could be made to the definition of block form with the added requirement of the blocks to be built on top of each other. For example, the new definition could read as any block form that differed from the previous form based on block position and/or direction of the form where one block is directly on top of another.

Anna's variability did not increase following the teaching sessions. It is unlikely that the Lag schedule or additional teaching conditions had any differential observed effects on her

behavior. There is no research indicating a participant must engage in a maximum number of varied responses for their behavior to be considered variable. Therefore, it could be hypothesized that Anna attained her ceiling of varied responses. Or, even though we made attempts to increase saliency across conditions (e.g., by changing the baseplate colors), it is possible that the critical features of the Lag schedule (reinforcement and extinction) did not establish relevant control over Anna's behavior. It is possible that more teaching sessions, beyond the four provided to Anna, may have resulted in an increase in varied responding. Future research could evaluate how many teaching sessions are required to increase variability of play behaviors of children diagnosed with ASD.

While all participants showed increases in novel forms throughout the study, Soren was the only participant to demonstrate increases in novel forms due to the Lag 1 schedule. The distinct increases in novel forms were observed after teaching sessions were conducted. This suggests that teaching the schedule's requirement for reinforcement may increase novel play behaviors. Further research could further examine the effects of the Lag schedule of reinforcement on novel play behaviors.

A limitation of the study consists of stimulus control. Participants had been exposed to match-to-sample programming at the clinic, presented similarly to the study's conditions. The stimulus control of these materials could potentially explain why participants engaged in low rates of variability during the Lag 1 condition. Further, the extended length of baseline in the withdrawal condition prevented the opportunity for participants to gain more exposure to other key stimuli (e.g., different colored plates) that correspond to different schedules of reinforcement. All participants exposed to the different baseplates tacted the color change when they began the sessions (i.e., "Wow, it's blue"); therefore, it is assumed participants noticed the

change in baseplate color. However, the baseplate color may have not been enough to discriminate between conditions. Rapid alternation between conditions, such as in the case of a multi-element design, may have increased the likelihood of stimulus control and therefore bringing behavior under the control schedules of reinforcement associated with each condition. Other possible alterations to the conditions could include the removal of the prebuilt form. The removal of the prebuilt form would reduce the likelihood that experimental conditions resembled those encountered in clinical programming during a match to sample task.

During one session of IOA for both Michael and Soren mean agreement percentage was 70%. This score was likely due to the positioning of the camera relative to the participants and their materials. Further, in video recordings some forms looked similar to others resulting in lower agreement percentages in some cases. Future researcher should attempt to use in vivo data collection for IOA to eliminate potential problems with video recording.

Relatedly, the task itself should be altered for future research. The current task was contrived in a way to eliminate as many extraneous variables as possible. However, the contrived nature of the task may have been too similar to programming participants are exposed to within the clinic. The materials used within the study could also be altered. Rather using baseplates and two individual blocks for each trial, future research could provide participants with multiple blocks at a time and allow participants to build freely. A more naturalistic environment (i.e., a play area) and naturalistic materials may be used in future research as it would not be as contrived as a table setting and would allow for greater generalization of findings.

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APPENDIX A: PREDETERMINED LIST OF BLOCK FORMS

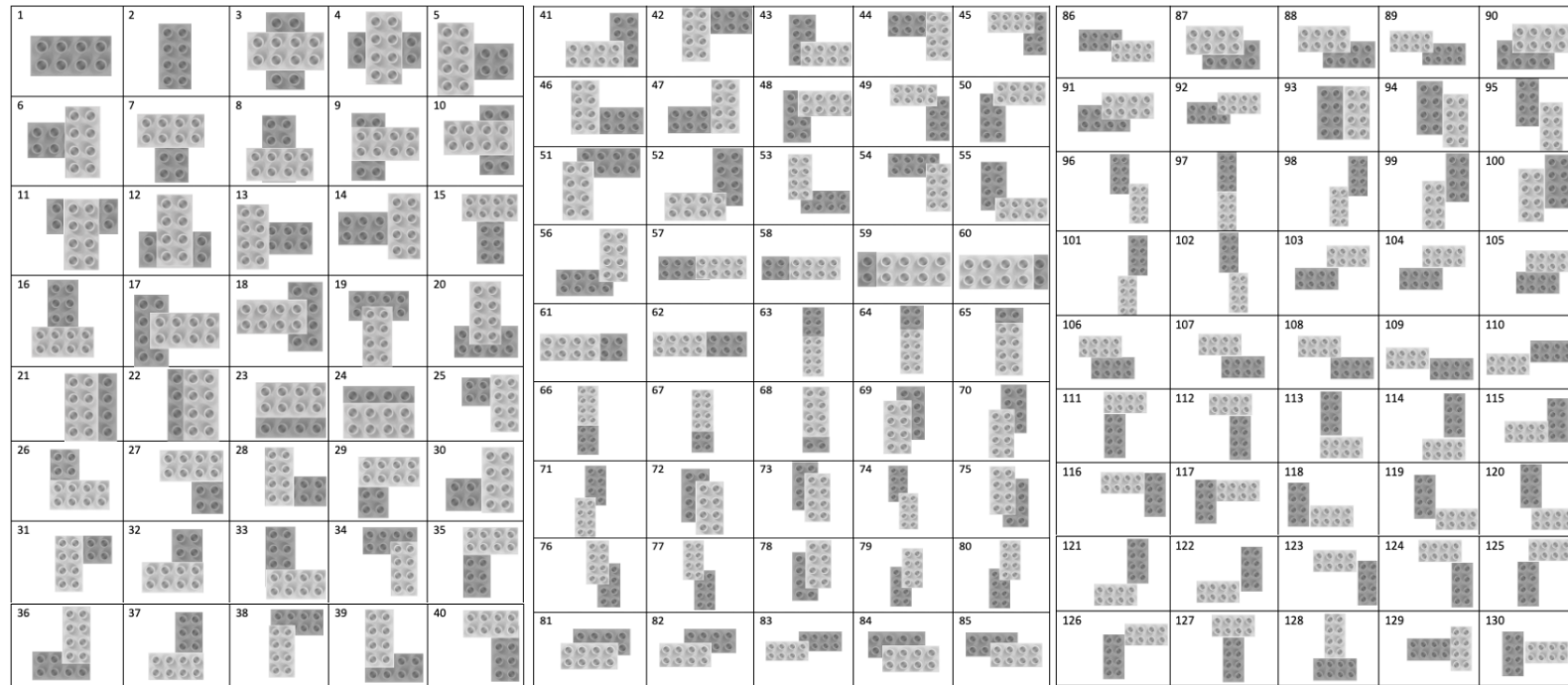


Figure 9 List of predetermined bock forms

APPENDIX B: PROCEDURAL FIDELITY CHECKLISTS

Play Variability in ASD: Baseline Condition			
Observer:	Date:		
Participant:			
<i>For each step of the intervention, record a "yes" if the researcher completes the step throughout entirety of the session, a "no" if the researcher does not complete the step at least once during the session, or a "n/a" if the step does not occur at all during the session.</i>			
	Yes	No	N/A
1. Researcher establishes attending from participant.			
2. The researcher states the Sd ("Build something").			
3. The researcher provides edible item for each build.			
4. Researcher removes block left baseplate and disassembles.			
5. Researcher moves block form on the right baseplate to the left baseplate.			
6. Researcher provides two new blocks on the right baseplate.			
7. Continues until at least 10 trials are run.			
Total number of each step			
Percent of procedural fidelity			

Table 1 Procedural fidelity checklist baseline condition

Play Variability in ASD: Lag 1 Condition			
Observer:	Date:		
Participant:			
For each step of the intervention, record a "yes" if the researcher completes the step throughout entirety of the session, a "no" if the researcher does not complete the step at least once during the session, or a "n/a" if the step does not occur at all during the session.			
	Yes	No	N/A
15. Researcher establishes attending from participant.			
16. The researcher states the Sd ("Build something").			
17. The researcher provides edible item and praise for a varied response states "ok" for a not varied response.			
18. Researcher removes block left baseplate and disassembles.			
19. Researcher moves block form on the right baseplate to the left baseplate.			
20. Researcher provides two new blocks on the right baseplate.			
21. Continues until at least 10 trials are run.			
Total number of each step			
Percent of procedural fidelity			

Table 2 Procedural fidelity checklist lag 1 condition

Play Variability in ASD: Teaching Sessions			
Observer:	Date:		
Participant:			
For each step of the intervention, record a "yes" if the researcher completes the step throughout entirety of the session, a "no" if the researcher does not complete the step at least once during the session, or a "n/a" if the step does not occur at all during the session.			
	Yes	No	N/A
17. Researcher establishes attending from participant.			
18. The researcher states the Sd ("Build something").			
19. Researcher full physically prompts participant to build something different.			
20. The researcher provides edible item and praise statement (i.e., "Good that's different).			
21. Researcher removes block left baseplate and disassembles.			
22. Researcher moves block form on the right baseplate to the left baseplate.			
23. Researcher provides two new blocks on the right baseplate.			
24. Continues until at least 10 trials are run.			
Total number of each step			
Percent of procedural fidelity			

Table 3 Procedural fidelity checklist teaching sessions