

Lindenwood University

Digital Commons@Lindenwood University

---

Theses

Theses & Dissertations

---

2022

## The Effects of Preference Assessments on the Duration of Independent Play for a Child with Autism Spectrum Disorder

Elise Amo

Lindenwood University, [eliseamo@gmail.com](mailto:eliseamo@gmail.com)

Robbie Hanson

Lindenwood University, [rhanson2@lindenwood.edu](mailto:rhanson2@lindenwood.edu)

Follow this and additional works at: <https://digitalcommons.lindenwood.edu/theses>



Part of the [Applied Behavior Analysis Commons](#), and the [Education Commons](#)

---

### Recommended Citation

Amo, Elise and Hanson, Robbie, "The Effects of Preference Assessments on the Duration of Independent Play for a Child with Autism Spectrum Disorder" (2022). *Theses*. 107.

<https://digitalcommons.lindenwood.edu/theses/107>

This Thesis is brought to you for free and open access by the Theses & Dissertations at Digital Commons@Lindenwood University. It has been accepted for inclusion in Theses by an authorized administrator of Digital Commons@Lindenwood University. For more information, please contact [phuffman@lindenwood.edu](mailto:phuffman@lindenwood.edu).

**The Effects of Preference Assessments on the Duration of Independent Play for a Child  
with Autism Spectrum Disorder**

Elise G. Amo

Dr. Robbie Hanson

Graduate School of Education, Lindenwood University

**Author Note**

This study is based on a thesis submitted by the first author under the supervision of the faculty advisor to Lindenwood University as partial fulfillment of the requirements for an M.A. degree in Applied Behavior Analysis.

### **Abstract**

Plays skills are important within typical development and independent play has shown to lead to the development of other skills, such as increased social interactions (Edwards et al., 2018). Previous research has demonstrated increases in independent play for children with autism spectrum disorder (ASD) who display skill deficits in this area. However, research has been largely lacking for increasing independent play for individuals with ASD who simply display a preference for interacting with adults. The current study examined the effectiveness of incorporating a multiple-stimulus without replacement (MSWO) preference assessment to increase the duration of independent play for a child with ASD. This study utilized an alternating treatment design, comparing a free operant (FO) play condition (baseline) with an FO play condition in which items identified as highly preferred were incorporated into the environment.

*Keywords:* autism spectrum disorder, duration, independent play, preference assessments, MSWO

## **The Effects of Preference Assessments on the Duration of Independent Play for a Child with Autism Spectrum Disorder**

Play is critical in the development of children, as play skills may be considered a behavioral cusp in which the learner is exposed to increased learning opportunities and new reinforcers allowing for the development of other skills, such as joint attention, language, turn-taking, waiting, and other social skills (Barton et al., 2020; Charlop et al., 2018; Cooper et al., 2020). Children with autism spectrum disorder (ASD) often have difficulty learning play skills as compared to their neurotypical peers and may face challenges with certain types of play, such as spontaneously mimicking other peers' play, pretend play, and independent play, among others (American Psychiatric Association, 2013; Sautter et al., 2008). Thus, effective play interventions are important for these populations and have been a focus of behavior-analytic research (e.g., Barton et al., 2020; Hoch et al., 2002; Lory et al., 2018; Sancho et al., 2010).

Independent play has been shown to be important for children to develop that can lead to other skills, such as increased social engagement with peers (Edwards et al., 2018). Previous research has demonstrated an increase in independent play by incorporating interventions for both independent and social play, by increasing functional play with objects with the use of chaining procedures, and the use of self-management techniques, among others (e.g., Edwards et al., 2018; Singh & Millichamp, 1987; Stahmer & Schreibman, 1992). Although this research has shown promising results, these interventions have targeted participants who display deficits in play skills, rather than participants who simply demonstrate a preference for social interaction with adults (e.g., preference issue versus a skill deficit). Further, previous research has indicated that children with ASD tend to have limited interests with objects, toys, or games, creating problems for teachers when finding reinforcers for their students to learn new academic skills

and may display a reliance on adult-led highly structured activities, leading to decreases in appropriate or on-task behavior during free-play opportunities (Edwards et al., 2018; Leaf et al., 2012). Additionally, although a preference for social interaction with adults may not be problematic at times, it may limit opportunities to engage with same-aged peers and there are circumstances in which engaging in independent play is required, such as during quiet and independent free-play time within a classroom setting, or when a parent or caregiver is occupied. Thus, interventions examining effective interventions for increasing independent play for individuals with preferences for adult-interaction seem warranted.

One area that has been largely unexplored to increase independent play for these individuals is the use of preference assessments to determine highly preferred items to incorporate into a free play environment. Single-stimulus (SS), paired-stimulus (PS), multiple-stimulus with replacement (MSW), multiple-stimulus without replacement (MSWO), and free operant (FO) preference assessments allow practitioners to rank items according to the frequency or duration of engagement (e.g., Clay et al., 2020; Karsten et al., 2011; Tung et al., 2017; Verriden & Roscoe, 2016). For example, FO preference assessments have been used to determine effective reinforcers to teach new skills and include recording the types of items the learner engages with, as well as the duration of engagement for those items in an unrestricted environment (Cooper et al., 2020). Sautter et al. (2008) conducted FO preference assessments to select play items that could be incorporated in a free play environment for six participants with ASD and their siblings within a controlled university-based therapy room. The results showed that the type of play item influenced the percentage of solitary versus interactive play (e.g., stimulatory toys increased solitary play whereas developmentally-oriented toys increased interactive play). Another seemingly related area that has been under researched for increasing

independent play in behavior analysis is environmental enrichment (e.g., Hoch et al., 2018; Quilitch & Risley, 1973; Ringdahl et al., 1997; Spear et al., 2018; Woods et al., 2020). For example, Ringdahl et al. (1997) examined the effects of environmental enrichment on automatically-maintained self-injurious behavior (SIB) for three participants with developmental disabilities. The researchers conducted an FO preference assessment to determine the participants' preferences for items that could potentially replace engagement in SIB and the results showed that two of the three participants chose the preferred stimuli identified within the FO preference assessment rather than engaging in SIB (Ringdahl et al., 1997).

Spear et al. (2018) investigated participants' preferences for unreplenished familiar items and replenished new items by measuring the duration of engagement with items that were rotated through a preference pool. The results of the study indicated that the participants preferred unreplenished familiar items or replenished new items if historically highly preferred items were inaccessible or the replenished items produced similar sensory input to the familiar highly preferred items (Spear et al., 2018). These results suggest that some children with ASD who have limited interests with certain toys or activities require a regular rotation of tangibles to maintain duration of play. One study incorporated increased quality and magnitude of reinforcement to increase the frequency of participants choosing a peer play environment rather than an independent play environment (Hoch et al., 2002). Hoch et al. (2002) conducted three experiments and used concurrent schedules of reinforcement during play interventions. The researchers arranged two concurrent response alternatives in two different types of settings for three boys with ASD. One setting included playing with a peer or sibling, and the other involved playing alone in another area. Hoch et al. (2002) also varied the duration of access to the toys and the participants' preferences in each setting. One condition included reinforcers of equal

magnitude and quality, and the other condition included greater magnitude and quality for play in the setting with the peer or sibling, rather than in the play-alone setting (Hoch et al., 2002). The results showed that the participants were more likely to choose the play condition in which the magnitude and quality of the reinforcers were higher with a peer or sibling present (Hoch et al., 2002). These results indicate that the continuous pairing of settings with reinforcers of higher quality and magnitude affect the choices that children with ASD make regarding play environments.

Additionally, environmental enrichment has been shown to be a significant tool for improving animal welfare at zoological facilities (Woods et al., 2020). Woods et al. (2020) conducted preference assessments to determine highly preferred items for lions within a zoo to use within the environment for enrichment purposes. The preference assessments included FO, PS with replacement, and PS without replacement to determine the lions' preferences. The researchers examined the lions' behavior with the items identified during the preference assessments over the course of 30, 24-hr trials. The results show a statistically significant relationship between the percentage of time the lions approached the enrichment item and the average duration of interaction during the initial preference assessments to the total duration of interaction and the percentage of time the lions interacted with the item within the environment (Woods et al., 2020). Thus, it appears that across both human and non-human research, incorporating highly preferred items into the environment may increase engagement with those items within a free play scenario. However, all of the aforementioned studies have utilized an FO preference assessment to identify highly preferred items to use in other free-play scenarios. Although these results are encouraging, there may be environments in which an initial FO preference assessment reveals little to no engagement with the play items currently available.

Thus, examining other preference assessments methods (e.g., MSWO) for identifying highly preferred items, not normally accessible within an existing play environment, to incorporate into free play scenarios would be beneficial.

Although teaching independent play skills may have been historically overlooked in the school setting due to the focus on academic achievements, teaching these skills in this environment has shown to lead to increased independence and the generalization of play skills with peers (Kossyvaki & Papoudi, 2016; Lory et al., 2018). Therefore, increasing independent play skills in the school setting is an important area of research, and incorporating the use of preference assessments and environmental enrichment may be a promising method of intervention. Thus, the purpose of the current study is to examine the use of preference assessments and environmental enrichment to increase the duration of independent play for a child with ASD in the school environment.

## **Method**

### **Participant and Setting**

A 10-year-old male with an independent diagnosis of ASD participated in the study. The study took place at a center-based applied behavior analysis (ABA) classroom nested within a public elementary school, in which the participant attended. He spent 80% of his time in a self-contained ABA/special education (SPED) classroom and 20% in the general education setting.

Prior to the start of the current study, the participant's teacher reported concerns with independent play. The participant's previous *Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP)* independent play scores showed regression from November 2019 (score of 11) to May 2021 (score of 7). Concerns with independent play were reported by teachers and his clinical team to be a result of the participant demonstrating a higher preference



for interactive activities with adults, rather than being due to a skill deficit. The participant had demonstrated appropriate independent play skills previously but in very limited durations and was observed to commonly seek out an adult to interact with during times in which independent play was instructed to occur. Although interactive play with adults was incorporated into the participant's programming and used as reinforcement for other skills being acquired, adult interactive play was not consistently available throughout the school day.

Data were collected within an area of the classroom known as the "Fun Zone" to the students and at a rectangular table placed in the back of the classroom. Seven other students, four ABA-trained paraprofessionals, and one ABA-trained/SPED teacher regularly transitioned in and out of the classroom. To control for potential confounding variables, the primary investigator implemented all experimental conditions at times in which other students were not in the same immediate environment as the participant. The primary investigator obtained consent from the participant's parents prior to the start of data collection. The participant and the parents could withdraw from the study at any time without penalty. All procedures were approved by the university's Institutional Review Board (IRB) prior to implementation.

## **Materials**

The primary investigator used a stopwatch application on an iPhone and collected data on two different sheets of paper. The first data sheet included the object(s) the participant engaged with and the duration in which the participant spent engaging with item(s) in the FO observation period (see Appendix A). The second datasheet consisted of five tables, each containing five trials, for the MSWO preference assessment (see Appendix B).

## **Dependent Variables and Response Definitions**

The primary dependent variable was the duration of independent play in which the participant actively engaged with tangible objects (e.g., stuffed toys, action figures, light-up toys, balls, cars, wind-up toys, etc.), or toys that required tactile construction (e.g., Marble Drop, Playdoh, Magnetix, magnetic tangrams, drawing, etc.) in the absence of seeking out adult attention. The secondary dependent variable was the occurrence of problem behaviors. Problem behaviors included elopement and SIB and were measured via frequency recording. Elopement was defined as any attempt or success at leaving the classroom without permission or moving two or more feet away from a designated area in the classroom or an adult in the hallway without permission. SIB was defined as any attempt or success at hitting self with an open or closed palm and/or biting self by closing his teeth over a body part or over clothing. Independent play during the FO observation period was defined as the participant reaching for and engaging with a play item by putting parts of the toy into motion. For example, if the student chose a car or another toy with wheels, the student could roll the toy back and forth or in a circular motion on the ground, or could race the cars, one against the other. The primary investigator started the timer when the participant reached for and engaged with an item and stopped the timer when the participant stopped engaging with an item for 10 s or more. The primary investigator recorded if the participant did or did not approach items in the environment, if the participant engaged with items in the environment, and the duration of engagement with items if engagement occurred. The primary investigator used total duration timing to measure the amount of time in which independent play occurred. Each observation period was 15 min.

## **General Procedure**

### ***Baseline***

The primary investigator conducted the FO baseline for the first four sessions of the study across different times of the day (i.e., either the participant's snack time/free choice time in the morning or during the participant's indoor recess in the afternoon). The primary investigator instructed the participant to, "Choose something to play with" to start the session. If the participant attempted to seek adult attention, the primary investigator provided the same instruction of, "Choose something to play with." If the participant was still engaged with an item or activity at the end of the 15 min observation period, he was allowed to continue to play with the item until he no longer engaged with the item or activity for 10 s or longer or until the participant needed to transition to the next small group or activity in his schedule, whichever occurred first. No prompts, interaction from the primary investigator, or differential consequences were delivered during initial baseline.

The duration of engagement was summed within the observation period and the items or activities with the longest duration, moderate duration(s), and shortest duration were noted.

### ***MSWO Preference Assessment***

During this phase, the primary investigator sat across from the participant at a rectangular table in the back of the participant's classroom. The investigator conducted the MSWO preference assessment during the participant's snack time/free choice time in the morning or during the participant's indoor recess in the afternoon, depending on the day. Five items or toys the student did not normally have access to were placed on the floor. These items were based on the participant's interests in arts and crafts, television shows, and what he was reported to engage with in the Fun Zone of the classroom, per teacher report. The items included new wind-up toys, a stuffed toy from the participant's favorite television show, Mickey Mouse figurines, Mickey Mouse puzzles, and a new wooden train set.

The primary investigator placed five activities and toys in clear, plastic containers linearly within reach of the participant, approximately 1 in. (0.03 m), and blocked the view from the participant using a wooden partition. If the participant attempted to grab items without the investigator giving an instruction, the investigator blocked the participant's access with her hand. The investigator gave the instruction, "Choose something to play with." If the participant attempted to pick multiple items, the investigator blocked access and reminded the participant to "Pick only one" or "Pick one now. You may pick another one next." The investigator allowed the participant to engage with the item for 30 s while removing the other items from the field. The investigator arranged the remaining items in the field and repeated this process until all items had been removed and repeated these steps four additional times (for a total of 25 trials).

After 25 trials, the primary investigator added the sums of the trials for each item. For example, if the participant chose Item A first for each of the five trials, the investigator added  $1 + 1 + 1 + 1 + 1 = 5$ . If the participant chose Item B second for two trials, third for two trials, and fourth for the final trial, the investigator added  $2 + 2 + 3 + 3 + 4 = 14$ . The lowest summed trials indicated the highest preferred item, and the highest summed trials indicated the lowest preferred item. Items were ranked on a scale of 1-5 based on the sums obtained.

Following the end of the MSWO, the primary investigator placed the top three highest preferred items in the natural environment in which free play typically occurred in an FO condition. Items were placed in the environment without the participant observing the investigator place the items. The duration of engagement was summed within the observation period and the items or activities with the longest duration, moderate duration(s), and shortest duration were noted. The primary investigator provided the instruction, "Choose something to play with" only if the participant attempted to or engaged in adult attention or elopement. No

interaction from the primary investigator, other adults, or differential consequences were delivered.

### **Experimental Design**

An alternating treatment design was used in which following an initial FO baseline, an FO baseline was then randomly alternated with the intervention (FO condition incorporating items from the MSWO). Utilizing this design allowed the primary investigator to begin intervention and evaluate differences between conditions quickly (Cooper et al., 2020). Rapid comparisons between conditions minimized the possibility of interfering extraneous variables and provided more opportunities to increase behavior change. Additionally, rapid comparisons reduced the chances for sequence effects to occur throughout the study, and therefore, minimized the threat to the study's internal validity.

### **Interobserver Agreement (IOA) and Procedural Integrity**

A secondary observer simultaneously but independently collected interobserver agreement (IOA) data for 36% of baseline and treatment sessions. First, mean duration per occurrence IOA was calculated by dividing the smaller duration by the larger duration between the two observers for each occurrence. These values were then summed and divided by the total number of occurrences and multiplied by 100 to obtain a percentage. IOA averaged 91% (range, 65-100%).

A secondary observer collected procedural integrity data for 47% of the FO baseline sessions and 42% of MSWO preference assessments. The secondary observer was a behavior analyst with 6 years of experience as a BCBA, who had been trained on the implementation of FO and MSWO preference assessments and who reviewed the procedural integrity checklist with the primary investigator prior to the start of the study. A checklist was used for the secondary

observer to record whether the steps of the intervention were implemented correctly. Procedural integrity was calculated by dividing the number of steps implemented correctly by the total number of steps from the checklist and multiplying by 100 to obtain a percentage. Procedural integrity averaged 100% during the FO baseline and averaged 99.7% (range, 97.7-100%) during the MSWO intervention.

### **Results**

The results from the MSWO preference assessments showed that the participant's three highest preferred items included wind-up toys, a wooden train set, and a stuffed toy from the television show "Owl House." See Figure 1 for the MSWO preference assessment results. A low ranking indicated the item was highly preferred (lower numbers indicate the items chosen first), and a higher ranking showed the item was less preferred (higher numbers indicate the items chosen last). The participant consistently chose the same items for every trial, regardless of the item's placement in the array.

Figure 2 shows the duration of independent play during baseline and intervention. During the baseline condition, the participant engaged in 0 min of independent play across all four opportunities. During intervention in which items from the MSWO preference assessment were incorporated into the play environment, the participant engaged in an average of 7.49 min of independent play (range, 0-15.47 min). When the FO baseline condition was replicated within the alternating treatments design, the participant engaged in an average of 2.2 min (range, 0-9.53 min) of independent play.

Figure 3 shows the frequency of problem behavior exhibited by the participant during baseline and intervention. The participant exhibited an average of 0.1 occurrences of elopement and SIB (range, 0-1).

## Discussion

The purpose of the current study was to examine the use of preference assessments and environmental enrichment to increase the duration of independent play for a child with ASD in the school environment. Previous research reveals that play skills, including independent play, are important in the development of children, as these skills can lead to more social engagement with peers, among other skills (Sautter et al., 2008). Although previous research has demonstrated promising results for increasing independent play, no previous studies have appeared to target individuals who have a preference for interacting with adults rather than a skill deficit.

The primary investigator utilized an alternating treatment design, comparing an FO baseline with an FO condition in which items identified as highly preferred via a MSWO preference assessment were incorporated into the play environment. The participant's overall duration of play increased in the play conditions when the highest preferred items from the MSWO preference assessment were present. When these items were not present, the participant engaged in very little to no play with items that were already present in the play environment, except for Session 19 in which the participant played with a wind-up toy similar to the wind-up toys from the MSWO preference assessment. Although Session 19 may be seen as a limitation to the experimental control of the current study, it may also support previous research that has indicated that if highly preferred items are not available, individuals may increase their engagement with similar items that are currently available (e.g., Spear et al., 2018).

Although the study demonstrated an increase in independent play, the study presented some limitations. First, the participant occasionally was observed to sit on a rocking chair or on a large beanbag in the play environment, rather than engaging with play items across both baseline

and MSWO conditions. Thus, it was unclear if these items interfered or competed with the participant's duration of play. Future research should examine this as a possibility.

Second, the participant's play environment was restricted to one area of the classroom and the participant was observed to attempt to transition to other areas of the classroom while continuing to manipulate a play item. The primary investigator did not prompt the participant to return to the designated play environment unless the participant attempted to elope and engage with adults for social attention. However, it would be expected that in a natural classroom environment, students would not be permitted to play in other areas of the classroom not specifically designated for play. Thus, it is unclear if restricted play areas impacted the results and should be explored in future research. Third, this study only included one participant and generalization and maintenance data were not collected. Therefore, these results may not be replicable for other participants, and it is unclear the extent that the results would generalize to other settings and stimuli or maintain across time.

Overall, the results from the current study are promising, as increasing play for children with ASD creates more learning opportunities and the development of more social skills (Edwards et al., 2018). To further the understanding of how practitioners can increase these skills, specifically for individuals who do not display a skill deficit but rather demonstrate a preference for adult-interaction, more research needs to be conducted on how environmental enrichment, the types of environments, and the effectiveness of preference assessments could influence independent play in children with ASD.



## References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Barton, E., Murray, R., O'Flaherty, C., Sweeney, E., & Gossett, S. (2020). Teaching object play to young children with disabilities: A systematic review of methods and rigor. *American Journal of Intellectual and Developmental Disabilities, 125*(1), 14-36.  
<https://doi.org/10.1352/1944-7558-125.1.14>
- Cannella, H. I., O'Reilly, M. F., & Lancioni, G. E. (2005). Choice and preference assessment research with people with severe to profound developmental disabilities: A review of the literature. *Research in Developmental Disabilities, 26*(1), 1-15.  
<https://doi.org/10.1016/j.ridd.2004.01.006>
- Charlop, M. H., Lang, R. B., & Rispoli, M. J. (2018). Conclusion: Play and social skills as behavioral cusps. In N. N. Singh (Ed.), *Play and social skills for children with autism spectrum disorder* (pp. 152-166). Springer. [https://doi.org/10.1007/978-3-319-72500-0\\_9](https://doi.org/10.1007/978-3-319-72500-0_9)
- Clay, C. J., Schmitz, B. A., Clohisy, A. M., Haider, A. F. & Kahng, S. W. (2020). Evaluation of free-operant preference assessment: Outcomes of varying session duration and problem behavior. *Behavior Modification, 45*(6), 962-987.  
<https://doi.org/10.1177/0145445520925429>
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2020). *Applied behavior analysis* (3rd ed.). Pearson Education.
- Edwards, C. K., Landa, R. K., & Frampton, S. E. (2018). Increasing functional leisure engagement for children with autism using backward chaining. *Behavior Modification, 42*(1), 9-33. <https://doi.org/10.1177/0145445517699929>

Hoch, H., McComas, J. J., Johnson, L., Faranda, N., & Guenther, S. L. (2002). The effects of magnitude and quality of reinforcement on choice responding during play activities.

*Journal of Applied Behavior Analysis, 35*(2), 171-181.

<https://doi.org/10.1901/jaba.2002.35-171>

Karsten, A. M., Carr, J. E., & Lepper, T. L. (2011). Description of a practitioner model for identifying preferred stimuli with individuals with autism spectrum disorders. *Behavior Modification, 35*(4), 347-369.

<https://doi.org/10.1177/0145445511405184>

Kossyvaki, L., & Papoudi, D. (2016). A review of play interventions for children with autism at school. *International Journal of Disability, Development and Education, 63*(1), 45-63.

<https://doi.org/10.1080/1034912X.2015.1111303>

Leaf, J., Oppenheim-Leaf, M. L., Leaf, R., Courtemanche, A. B., Taubman, M., McEachin, J.,

Sheldon, J. B., & Sherman, J. A. (2012). Observational effects on the preferences of children with autism. *Journal of Applied Behavior Analysis, 45*(3), 473-483.

<https://doi.org/10.1901/jaba.2012.45-473>

Lory, C., Rispoli, M., & Gregori, E. (2018). Play interventions involving children with autism spectrum disorder and typically developing peers: A review of research quality. *Review Journal of Autism and Developmental Disorders, 5*(1), 78-89.

<https://doi.org/10.1007/s40489-017-0124-2>

<https://doi.org/10.1007/s40489-017-0124-2>

Quilitch, H. R., & Risley, T. R. (1973). The effects of play materials on social play. *Journal of Applied Behavior Analysis, 6*(4), 573-578.

<https://doi.org/10.1901/jaba.1973.6-573>

Ringdahl, J. E., Vollmer, T. R., Marcus, B. A., & Roane, H. S. (1997). An analogue evaluation of environmental enrichment: The role of stimulus preference. *Journal of Applied Behavior Analysis, 30*(2), 203-216.

<https://doi.org/10.1901/jaba.1997.30-203>

- Sancho, K., Sidener, T. M., Reeve, S. A., & Sidener, D. W. (2010). Two variations of video modeling interventions for teaching play skills to children with autism. *Education & Treatment of Children, 33*(3), 421-442. <https://doi.org/10.1353/etc.0.0097>
- Sautter, R. A., LeBlanc, L. A., & Gillett, J. N. (2008). Using free operant preference assessments to select toys for free play between children with autism and siblings. *Research in Autism Spectrum Disorders, 2*(1), 17-27. <https://doi.org/10.1016/j.rasd.2007.02.001>
- Singh, N. N., & Millichamp, C. J. (1987). Independent and social play among profoundly retarded adults: Training, maintenance, generalization, and long-term follow-up. *Journal of Applied Behavior Analysis, 20*(1), 23-34. <https://doi.org/10.1901/jaba.1987.20-23>
- Spear, M. A., Karsten, A., & White, E. A. (2018). Restricted interests and autism: Further assessment of preferences for a variety of leisure items. *Behavior Modification, 42*(1), 108-125. <https://doi.org/10.1177/0145445516686301>
- Stahmer, A. C., & Schreibman, L. (1992). Teaching children with autism appropriate play in unsupervised environments using a self-management treatment package. *Journal of Applied Behavior Analysis, 25*(2), 447-459. <https://doi.org/10.1901/jaba.1992.25-447>
- Tung, S. B., Donaldson, J. M., & Kahng, S. W. (2017). The effects of preference assessment type on problem behavior. *Journal of Applied Behavior Analysis, 50*(4), 861-866. <https://doi.org/10.1002/jaba.414>
- Verriden, A. L., & Roscoe, E. M. (2016). A comparison of preference assessment methods. *Journal of Applied Behavior Analysis, 49*(2), 265-285. <https://doi.org/10.1002/jaba.302>

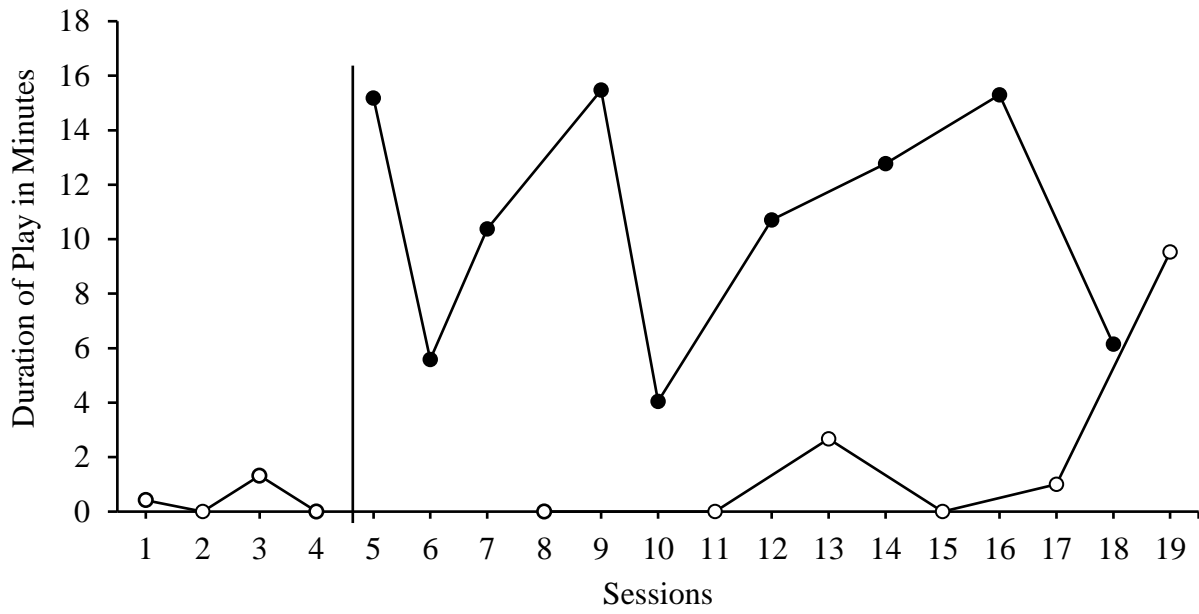
Woods, J. M., Lane, E. K., & Miller, L. J. (2020). Preference assessments as a tool to evaluate environmental enrichment. *Zoo Biology*, *39*(6), 382-390.

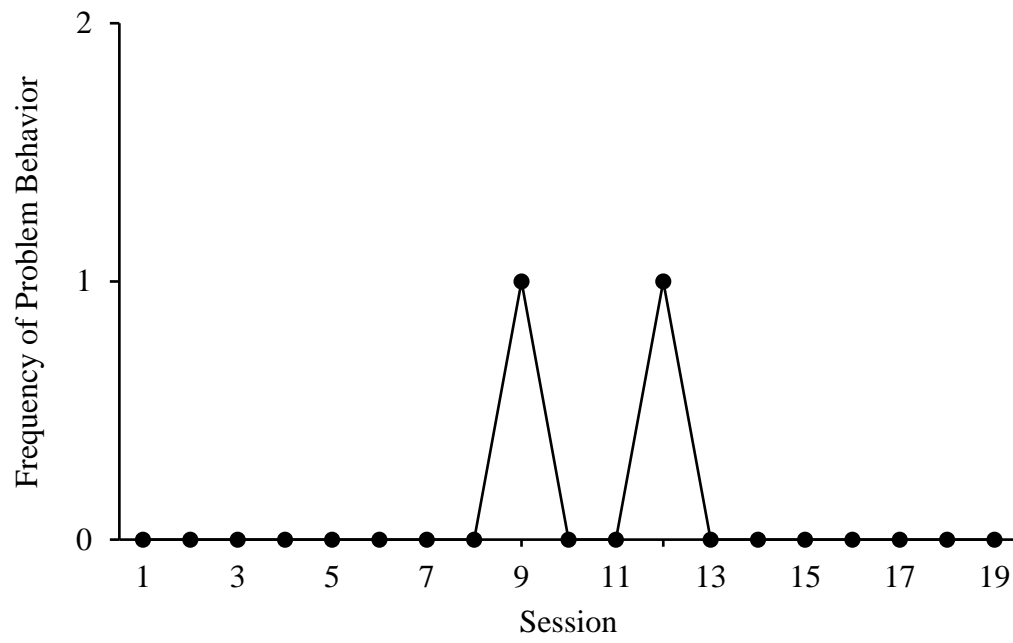
<https://doi.org/10.1002/zoo.21566>



**Figure 2**

*Duration of Play Results*



**Figure 3***Frequency of Problem Behavior*





**Appendix B**

**MSWO Data Sheet**

Item A: \_\_\_\_\_  
 Item B: \_\_\_\_\_  
 Item C: \_\_\_\_\_  
 Item D: \_\_\_\_\_  
 Item E: \_\_\_\_\_

Sum of trial #s for A: \_\_\_\_\_  
 Sum of trial #s for B: \_\_\_\_\_  
 Sum of trial #s for C: \_\_\_\_\_  
 Sum of trial #s for D: \_\_\_\_\_  
 Sum of trial #s for E: \_\_\_\_\_

Date:		
Child name:		
Teacher name:		
Trial #	Item selected	Placement of item selected
1		x x x x x
2		x x x x
3		x x x
4		x x
5		x

Date:		
Child name:		
Teacher name:		
Trial #	Item selected	Placement of item selected
1		x x x x x
2		x x x x
3		x x x
4		x x
5		x

Date:		
Child name:		
Teacher name:		
Trial #	Item selected	Placement of item selected
1		x x x x x
2		x x x x
3		x x x
4		x x
5		x

Date:		
Child name:		
Teacher name:		
Trial #	Item selected	Placement of item selected
1		x x x x x
2		x x x x
3		x x x
4		x x
5		x

Date:		
Child name:		
Teacher name:		
Trial #	Item selected	Placement of item selected
1		x x x x x
2		x x x x
3		x x x
4		x x
5		x

Highest preferred items (lowest summed trial #s):

Moderately preferred items (moderate summed trial #s):

Lowest preferred items (highest summed trial #s):

**Appendix C**

**Procedural Integrity Checklists**

FO Baseline Condition	Yes (+), No (-), or N/A
Did the researcher give the correct SD?: “Mohamed, choose something to play with.”	+ -
Did the researcher present the SD again if the participant attempted to engage with an adult?	+ - N/A
Did the researcher record duration per occurrence with each item the participant engaged with?	+ -
Did the researcher add up the total duration correctly?	+ -
Treatment Integrity Percentage	

MSWO Preference Assessment	Sitting 1 Yes (+), No (-), or N/A	Sitting 2 Yes (+), No (-), or N/A	Sitting 3 Yes (+), No (-), or N/A	Sitting 4 Yes (+), No (-), or N/A	Sitting 5 Yes (+), No (-), or N/A
Did the researcher place the items linearly in the bins on the floor behind the partition?	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5
Did the researcher block the stimuli from view while arranging them on the floor?	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5
Did the researcher block access to the items if the participant attempted to access the items prior to the SD? (if applicable)	+ - + - + - + -	+ - + - + - + -	+ - + - + - + -	+ - + - + - + -	+ - + - + - + -

	+ - N/A /5	+ - N/A /5	+ - N/A /5	+ - N/A /5	+ - N/A /5
Did the researcher give the correct SD for each trial?: “Mohamed, choose something to play with.” (Count this for each trial in a sitting.)	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5
Did the researcher allow the participant to engage with the item in each trial for 30 s? (Count this for each trial in a sitting.)	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5
Did the researcher get the item back from the participant after the 30 s ended? (Count this for each trial in a sitting.)	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5
Did the researcher remove the items from the field once the participant chose an item to play with? (Count this for each trial in a sitting.)	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5	+ - + - + - + - + - N/A /5
Did the researcher rearrange the items in the field for each trial? (Count this for each trial in a sitting.)	+ - + - + - + - + -	+ - + - + - + - + -	+ - + - + - + - + -	+ - + - + - + - + -	+ - + - + - + - + -

	N/A /5	N/A /5	N/A /5	N/A /5	N/A /5
Did the researcher add up the sums of the trials for each item?	+ - + - + - + - + -  N/A /5	+ - + - + - + - + -  N/A /5	+ - + - + - + - + -  N/A /5	+ - + - + - + - + -  N/A /5	+ - + - + - + - + -  N/A /5
Treatment Integrity %					