Do Young Children Demonstrate a "Reverse" Endowment Effect? Tracking Ownership and Object Preference in Owned Toys Versus Peers' Toys

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Abstract

Previous research has indicated that children exhibit an endowment effect (preferring items that they own), but this study is the first to investigate the possibility of a reverse endowment effect (preferring items that others own). Participants ages 4.5-6.99 were assigned a toy at the beginning of the experiment, and later saw a video of a child with a different toy, either actively engaging with it or not engaging with it. Toy preferences were measured in terms of children's interactions with and ratings of each toy, and their choices of which toy to take home. There was a main effect of the video condition on children's preferences for certain toys; specifically, children in the active condition were more likely to touch the toy in the video but to choose their assigned toy to take home. These findings suggest both an endowment effect and a reverse endowment effect in young children.

Keywords: children, ownership, endowment effect, conceptual development

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This paper examines how ownership affects children's preferences for certain objects. Specifically, we will raise the possibility that in addition to the well-studied endowment effect, which holds that people have a preference for items they own, children may also demonstrate a reverse endowment effect, whereby they prefer objects that other children own. In this introduction, I will review the literature relevant to these phenomena and discuss the study we performed to investigate this proposed theory.

It is clear that children possess knowledge and an understanding of ownership from quite early on in development (Gelman, Manczak, & Noles 2012; Nancekivell, Friedman, & Gelman, 2019; Ross, 2013). Not only do children understand ownership from a young age, but they show adult-like heuristics in identifying owners (Gelman et al., 2012). Toddlers are able to identify the owners of familiar objects (Fasig, 2000), infer ownership based on first possession (Gelman et al., 2012), demonstrate awareness of ownership rights (Ross, 2013), and assert their own ownership over objects (Ross, Friedman, & Field, 2015). According to Ross et al. (2015), children must possess and act on two different types of knowledge in order to assert ownership rights and to respect their peers' ownership rights. They must know which objects belong to people and they must appreciate and acknowledge owners' rights (Ross et al., 2015). Evidence supports the fact that children as young as toddlers demonstrate both of these types of knowledge (Ross et al., 2015) and therefore understand and can act upon the concept of ownership.

Similarly, studies have shown that children as young as two years of age, like adults, demonstrate an endowment effect (Gelman et al., 2012; Harbaugh, Krause, & Vesterlund, 2001). The endowment effect is "the tendency for people who own a good to value it more than people who do not" (Morewedge & Giblin, 2015). People consistently ask for more to give up things

they own than they are willing to pay to acquire an object of the same value, according to two experimental paradigms (Morewedge & Giblin, 2015). In the exchange paradigm, participants are more hesitant to exchange a good they are endowed with for another good, and in the valuation paradigm, the minimum amount of money a seller is willing to except for a good exceeds the maximum amount of money a participant is willing to pay to acquire that good (Morewedge et al., 2015). A study done by Harbaugh et al. (2001) found strong evidence for the existence of an endowment effect in children across a wide range of ages (from kindergarten to fifth grade), as children were more likely to choose a good (e.g., keychain) when it had been given to them than when it was offered in exchange. Hood and Bloom (2008) found that young children prefer an object that they own to an exact replica of that object, again showing that owned objects may have special value. Similarly, children defended the possession of a toy much more aggressively when the toy belonged only to them compared to when the toy belonged to their class (Eisenberg-Berg, Haake, & Bartlett, 1981; Eisenberg-Berg, Haake, Hand, & Sadalla, 1979). These results indicate that children show an endowment effect when studied in isolation, but do not examine this in the context of children's social interactions.

In a study done by Ross (2013), toddlers' sensitivity to ownership in everyday interactions with their peers were examined, and strong evidence supported still the presence of an endowment effect. Children who were designated owners were more likely to prompt conflicts or arguments over their toys when non-owners were in possession of them than the opposite (Ross, 2013). In a similar study, results showed that children declared their ownership status and attempted to re-gain possession of their toys when other children were playing with them (Ross et al., 2015). It is evident that child owners still place a higher value on their own possessions when engaging in social interactions with non-owners.

While it is clear that children demonstrate an endowment effect, a "reverse" endowment effect (namely, placing higher value on items that someone else owns) may also be operating. Depending on how another child interacts with an object, a child may prefer that other child's object out of social referencing. For example, if a child sees their peer actively playing with a toy and having fun, they may demonstrate a reverse-endowment effect and prefer that child's toy to one that they own. Studies of children fighting over toys indicate that non-owners try to take possession of other children's toys, which may reflect reverse-endowment (Ross, 2013; Ross et al., 2015).

Present Study

The current study aims to investigate whether children show a reverse-endowment effect (placing higher value on a toy that belongs to another child), and how much the nature of the other child's interaction with the toy makes a difference (e.g., whether the child is just holding the toy or actively playing with it). The study looks at children's preferences, and specifically explores whether children prefer items that either they own or another child owns. The age range of 4-7 was selected to provide insight into children's early understandings. Children at these ages are able to identify and assert ownership (Fasig, 2000; Gelman et al., 2012; Ross, 2013; Ross, Friedman, & Field, 2015), as previously stated, and are old enough to engage in these tasks. Prior studies indicate that adults and children show an endowment effect, placing higher value on items they own than items that another person owns. However, to date I am unaware of any research that has examined the reverse-endowment effect.

Based on the review of relevant literature, I predict that participants of the current study will demonstrate both an endowment effect and a reverse endowment effect, and that the latter will depend on the activity of another child owner. As the study examines three conditions in which the subject watches a child either actively engaging with a toy, inactively engaging with

the toy, or actively ignoring the toy, I predict that children will demonstrate behavior as a function of those conditions; the more actively engaged the child in the video is with the toy, the stronger the reverse endowment effect, causing the child to show preferential behavior towards an object another child has and clearly enjoys.

Method

Participants

Participants were 85 children ages 4.5 to 6.99 (Mean [*M*] = 5.54, age range = 4.47 – 6.98, 43 females, 42 males). An additional 30 children were excluded for the following reasons: the participant had one of the experimental toys at home (25), the child was unable to complete the tasks necessary for the study (3), or experimenter error (2). Participants of the study were children from the local Ann Arbor community, recruited through the Conceptual Development Lab database (a large collection of families interested in this research). Children were tested individually in a research lab on University of Michigan's campus. All participants were guided through the assent process and parents through the consent process prior to beginning the study. Families were compensated $10 (per child) for their time; in addition, participants were able to choose a toy to take home.

Design

Participants were assigned to one of three video conditions, one of two toy assignments, and one of four presentation orders. In terms of video assignments, participants were assigned to view a video that displayed one of three conditions: Active, Hand, or Table. In the active condition, the child in the video was actively engaging with the toy. In the hand condition, the child in the video was statically holding the toy in their hand. In the table condition, the toy was resting on the table, and the child in the video was engaging in another activity (e.g., reading a book). For the two toy assignments, we ensured that each participant received the infinity toy as

the assigned toy and the string blocks for the video toy, or vice versa (string blocks as assigned and infinity as video). Regarding toy presentation order, four different collections of randomized toy orders were assigned to vary the sequence of toys presented each time a participant was asked to rate the objects. Combining these various conditions, 24 unique conditions were created. The video condition, toy assignment, and presentation order were between-subject variables, while the within-subject variable was the four identical toys that each participant was presented with throughout the study.

Materials and Procedure

In the waiting room of the lab, subjects were first told that they would be going on a "tour" of the lab, employing a cover story for why the child would engage in the different activities that are presented. In the waiting room, the child was presented with four images, each of a different toy: a string of colored blocks (string blocks), a colorful "infinity toy" (infinity toy), a squishable smiley-face toy (distractor), and a plain wooden block (block). See Figure 1 below for a visual of the four toys. The four toys were pretested with a separate group of children to be roughly equivalent in desirability. The participant was asked to rate each toy in order to determine how much the child initially liked each of the toys.

The child was then brought to the first room of the tour (room one). The participant was given either the infinity toy or the string blocks, and told that they could take this toy home after completion of the study. This toy given to the child was the assigned toy. The subject was then allowed to play with the toy for 25 seconds, in order to enable the child to become familiar with this toy and develop a sense of ownership. They were then presented with the images of the four toys and asked which of the toys they had just played with, to check their memory. The child was then brought to the next room (room two) on the tour of the lab and asked to help file a piece of paper; this was purely a distractor assignment that fits into the cover story.

The participant was then brought to another room (room three) and shown a video of another girl/boy (gender-matched) interacting with a toy. The toy shown in the video (video toy) was the one opposite the assigned toy, which had been given at the start of the study. If the child was given the string blocks as the assigned toy, then the video toy was the infinity toy; if the child was given the infinity toy as the assigned toy, then the video toy was the string blocks. The video shown had one of three conditions: Active, Hand, or Table (see Design above). Following the video, the participant was presented with the images of the four toys and asked which toy they had seen in the video, to check their memory. They were then asked what the boy/girl in the video did with the toy, in order to see if the child understood the manipulation or condition of the video.

A second experimenter then brought the subject back to the initial test room (room one), where the four toys were in a box on the table. The child was asked which toy they would like to take home, regardless of which toy they were initially assigned. The child was asked to again rate the four toys, and asked which toy they had originally played with (to test their memory of the assigned toy). Finally the child was left alone for one minute and told that they could play with any of the toys. The amount of time spent playing with each of the toys was recorded.

Coding

Manipulation check. In order to ensure that the participants were paying attention to and understood the video they were presented with, each child was asked, “What did the boy/girl in the video do with the toy?” following the video. Each participant’s response was coded as H (Hand), A (Active), T (Table), O (Other), or N (Nothing), and coders were blind to the participants’ assigned manipulations (video conditions). Responses were coded as “H” if participants were clear that the toy was being held by the child in the video, “A” if participants made it obvious that the child in the video actively used the toy, and “T” if the participant

mentioned that the toy in the video was simply on the table. “O” responses included those that combined two different conditions or those that indicated that the participant was confused or unfocused, while “N” responses indicating that child in the video doing nothing with the toy (as this could be classified as either Hand or Table). See Table 1 below for a more detailed coding scheme.

Two research assistants independently coded participants’ responses to this manipulation check question. Disagreements were resolved by discussion. The percent agreement between the two coders was 88.10%. Cohen’s kappa (κ) was run in order to determine the level of agreement between the two coders’ judgment. There was almost perfect agreement between the two coders’ judgments, $\kappa = .838$ (95% CI, .743 to .932).

Initially (comparing Hand, Active, and Table conditions), we observed that 72.94% of all participants in all conditions responded according to their condition. While 93.75% of participants shown the video with the Active condition responded according to their assigned manipulation, only 72.41% of those shown the Hand condition and 45.83% of those shown the Table Condition responded according to the manipulation given. When not accounting for those whose responses were coded as “Other,” 80.77% of participants shown the Hand condition and 55.00% of those shown the Table condition responded according to their condition.

After examining the participants’ responses, our sense was that many of the errors were due to participants responding according to the “Nothing” coding category for both the Hand and Table conditions, and that participants were more focused on whether the child in the video was actively manipulating the toy or not. For this reason, we collapsed the Hand and Table conditions and compared the Active condition to the “inactive” conditions (Hand and Table) as a whole (Inactive). After collapsing the Hand and Table conditions, forming the Inactive condition, we observed that 85.88% of all participants in both conditions responded according to their condition. 81.13% of participants shown

an Inactive condition responded according to this manipulation. When not accounting for the participants whose responses were coded as "Other," 86.00% of participants in the Inactive condition responded accordingly. We collapsed the Hand and Table conditions to form the Inactive condition for all subsequent analyses.

Toy ratings. Participants rated each toy using a modified Likert scale, with five face characters (see Figure 2). Each time a participant was asked how much they liked each of the toys, their response was coded on a scale from 1-5 according to the face character they pointed to. The face with the largest smile was coded as a 5 ("like") and the face with the largest frown was coded as a 1 ("dislike").

Touch data. When each child was left to play with the toys for one minute, their engagement (or lack thereof) was measured by assessing whether the child touched each toy over 12 five-second intervals. Initially, one coder determined the starting point for each video by establishing the time point at which the box of toys was opened in front of the participant. This starting time was then used by two new coders who examined the five-second intervals during the 60-second time period. For each five-second interval, a yes or no decision was made about which of any toys were contacted, and a participant could have touched more than one toy within an interval. A contact with a toy was coded as a "1" and the lack of contact with a toy was coded as a "0" for each interval. All videos were independently coded by two research assistants and the disagreements were resolved by discussion. Participants were omitted from video coding and analysis if video was not recorded or if the 60-second interval was cut short in any way, so a total of 77 participants' videos were coded. The agreement between the two coders ranged from 95% to 98% for each segment, with a total agreement of 97%. Cohen's kappa (κ) was run in order to determine the level of agreement between the two coders' judgment. There was almost perfect agreement between the two coders' judgments, $\kappa = .962$ (95% CI, .955 to .969).

Results

Memory Check

First, we wanted to ensure that the children were focused on the activity at hand and that they were able to remember which toy they had been presented with. After initially being given the assigned toy in room one, the child was asked which toy they had been given (memory check 1). The child was shown pictures of the four toys and asked to point to the one they had been given. For this first memory check (memory check 1), 84/85 (or 98.82%) of participants correctly remembered the assigned toy they had been given. After watching the video in room three, the child was asked which toy they had seen in the video. The child was again shown pictures of the four experimental toys and asked to point to the one they had seen in the video. For this second memory check (memory check 2), 81/85 (or 95.29%) or participants correctly remembered the video toy.

Toy Ratings

A repeated measures analysis of variance (ANOVA) with video condition (Active vs. Inactive) and time (time 1 vs. time 2) as between-subject variables, and toy type (assigned, video, distractor, block) as a within-subject variable was performed to determine if video condition had an effect on toy ratings before and after participants watched the video. Scores were entered between 1 and 5, where 1 was “dislike” and 5 was “like.” No significant effects of video condition, time or toy type by time were found. There was a main effect of toy type, $F(1, 83) = 12.87$, $p = .001$, $\eta_p^2 = .066$. Post-hoc pairwise comparisons revealed that the effect of toy type was due to ratings being significantly lower for the block than for all three other toys, with p-values $\leq .003$, whereas ratings for different toys did not differ from one another (p-values $> .4$).

Touch Data

An ANOVA with video condition and time (segments 1-12) as between-subject variables and toy type as a within-subject variable was conducted to determine differences in amounts of contact with each of the toys during free play. See Figures 3-5 below for visualizations of contacts over these 12 segments by video condition. For ease of analysis, we collapsed the segments into first half (time 1) vs. second half (time 2). As the videos of each participant were coded in 5-second intervals with a 1 being a contact and 0 being lack of contact for each toy, the averages across each half of the 60 seconds of play (segments 1-6 for time 1 and segments 7-12 for time 2) were computed for each toy and compared.

There was a main effect of toy type, $F(1, 69) = 2.52$, $p < .001$, $\eta_p^2 = .029$. This significant effect was due to the distractor toy being touched more than the other three toys and the block being touched less than the other three toys, with the assigned and video toys in the middle; this was indicated by pairwise comparisons (p-values ≤ .002). There was an interaction effect of toy type by time, $F(1, 69) = 4.94$, $p < .001$, $\eta_p^2 = .085$. Pairwise comparisons indicated that participants were more likely to touch the assigned toy during time 1 than time 2, more likely to touch the distractor during time 2 than time 1, and more likely to touch the block during time 1 than time 2 (p-values ≤ .007). There was also an interaction effect of toy type by condition, $F(1, 69) = .23$, $p = .03$, $\eta_p^2 = .043$. Post-hoc tests revealed that subjects were more likely to touch the video toy when given the active condition than the inactive condition, and that participants were more likely to touch the distractor toy in the inactive condition than the active condition (p-values ≤ .049). No other significant main effects or interactions were obtained.

Toy Choices

A Pearson Chi-Square was conducted with video condition as the between-subject variable and toy type as the within-subject variable to determine the effects of video condition on toy choice for both toy choice 1 (before one minute of active play) and toy choice 2 (final toy

choice). A significant effect of video condition on toy choice was found for choice 2, χ^2 (3) = 8.19, p = .042. For choice 1, the effect of video condition on toy choice approached statistical significance; there was a detectable association, χ^2 (3) = 7.33, p = .062. For both choice 1 and choice 2, the assigned toy was selected most frequently in the active condition and the distractor toy was selected most frequently in the inactive condition. No other significant effects were found.

Discussion

The present study investigated whether children demonstrate a "reverse" endowment effect (preferring objects owned by other individuals) in addition to an endowment effect (preferring objects owned by themselves). To determine children's preferences for certain objects, the ratings the children gave for each toy, the toy they chose to take home and the amount of time they spent interacting with each toy were recorded and analyzed. By manipulating the level of interaction another child had with a toy different from that assigned to the participant, these endowment or reverse endowment effects were investigated. It was hypothesized that children would demonstrate both an endowment effect and a reverse endowment effect, with the latter depending on the level of activity and interaction of the other child owner presented to participants. I predicted that children would demonstrate preferences as a function of the video manipulation conditions, as the more engaged the other child was with a different toy, the stronger the reverse endowment effect was likely to be. Therefore, it was hypothesized that children shown a video of a child choosing not to actively engage with a toy would demonstrate an endowment effect, placing higher value on the item they own (the toy they were assigned); on the other hand, children who were shown a video of a child actively playing with a novel toy would demonstrate a reverse endowment effect, placing higher value on the item the other child interacted with.

The study's results revealed that participants were more likely to *touch* the video toy when given the Active condition; however, children were more likely to *choose* their assigned toy when given the Active condition. These conclusions suggest opposite effects of ownership, as the touch data indicate that children demonstrate a reverse endowment effect whereas the toy choice data suggest that children demonstrate an endowment effect. Children may have been more likely to explore and engage with the video toy after seeing another child actively playing with this toy. In this way, children exhibited a reverse endowment effect, showing a preference for objects owned by another individual. In contrast, results based on participants' toy choices supported the presence of an endowment effect in young children, as children ultimately chose to take home their assigned toy when given the active condition, despite having had more contacts with the video to during free play. It is possible that seeing another child actively playing with their toy encouraged participants to think about how they could play with their own toy due to the similarity between these two toys. This active condition highlights ownership – a child understands that the toy the other child is playing with it *"his"* or *"hers"* while to them, the assigned toy is *"mine."* This finding supports much of the aforementioned research which indicated that children demonstrate an endowment effect similar to that in adults from a young age (Gelman et al., 2012; Harbaugh, Krause, & Vesterlund, 2001). However, these ownership effects depend on the way in which one defines preference; children chose to interact more with a peer's toy, but take home their assigned (owned) toy after viewing another child actively engaging with a toy.

In contrast, participants were more likely to touch the distractor when given the Inactive condition than the Active condition, and were also more likely to choose the distractor toy in this Inactive condition. This may be due to children sparking an interest in a novel toy after watching a video of a child lacking interest in the video toy. Participants had already had a chance to play

with their assigned toy and possibly had less interest in the video toy after watching another child disengaged with that toy, leading them to interact with and choose to take this unfamiliar distractor toy. These results do not provide evidence for an endowment effect as previous research has suggested, as children showed preference for a toy other than the one they owned. A reverse endowment effect is not necessarily supported by these results, nevertheless children preferred a toy other than the one they "owned" more when given this inactive condition than the active condition.

Results also showed that there were differences in the amount of contacts with certain toys during free play during the first half compared to the second half. Participants more frequently touched their assigned toy during time 1 (the first 30 second of play) than time 2 (the second 30 seconds of play). This could be due to the fact that participants had not interacted with this assigned toy since the very beginning of the experiment, and may indicate that an endowment-like effect is in effect. After viewing another child play with a toy different from their assigned toy, participants may have wanted to play with their assigned toy to foster a stronger sense of ownership and appreciate the quality of their toy. This effect lessened overtime, as participants made contact with the assigned toy less frequently during time 2.

Participants were also more likely to touch both the block and the distractor during time 2 than time 1. It is possible that participants were interested in exploring their assigned and video toys in order to see which they preferred following the video. After interacting with these other available toys, participants may have wanted to explore the block and distractor toys which they had not yet had the chance to interact with.

The results did not suggest a significant difference between the toy ratings between time 1 (before the video) and time 2 (after the video), which may be due to participants having strong preferences that are resistant to change. However, results showed that children were more likely

to overall rate the block significantly lower than the other three toys. Similarly, the block was touched less than the other toys during free play while the distractor was touched the most. These findings do not suggest that children demonstrate one effect of ownership or the other, as these data simply describe children's preferences for playing with certain toys. This finding indicates that the dependent variables were meaningful.

Limitations of the study should be addressed. The sample size was relatively small; however, we are continuing to recruit participants and collect data. A larger sample size might allow us to better understand some of the relationships that were nearing statistical significance, and either strengthen our conclusions or elucidate new possibilities. Similarly, the participants recruited for the study were from the general area surrounding U-M's campus, an academic environment in which the population is relatively homogeneous in terms of socioeconomic status. This may lead to limited generalizability of the results of the study. Another limitation may have been the strong general preference participants showed for the distractor toy, despite pre-testing with another sample of children which determined that the desirability and attractiveness of the four experimental toys was relatively equivalent. This may have limited our ability to determine whether an endowment effect or reverse endowment effect was being demonstrated in our study.

These findings and limitations point to future research as it leads to new directions in which studies can go. As the study's result did not point to the presence of a concrete endowment or reverse endowment effect but a combination of the two depending on the definition of preference, future research should examine further the possibility of a reverse endowment effect. Given the significant effects of manipulation condition on both the participants' interactions with and choices of owned versus other toys, a clear reverse endowment effect may exist, and this understudied phenomenon should be investigated further. By obtaining a larger sample size and

considering the use of less appealing distractor toys, future studies can build on the foundations of the current study by investigating the reverse endowment effect in young children. Future research may also extend the age range of these studies to better understand the different ownership effects used by individuals of different ages.

This study is the first to investigate the potential of a reverse endowment effect acting in children, and provides evidence that this idea of ownership may be acting in young children while a concrete endowment effect is consistently observed in adults (Morewedge & Giblin, 2015). The findings of the present study imply that a clear endowment effect may not exist in children as previously thought, but young children may place higher value on items owned by others depending on the context. These findings may lead us to reconsider how we understand young children to display ownership, allowing us to better comprehend and appreciate children's conceptual development.

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Tables

Table 1.

Manipulation Coding Scheme

Category	Example Responses
H (Hand)	"Hold it," "Put it on her hand," "She was holding the hand,"
A (Active)	"Stretch it," "Played with it," "Tangled it up," "Wrapped it around," "Playing, "Make things with it," "Twisting it," "Turned it into a shape"
T (Table)	"Just on the table," "Leave it on the table," "The toy's on the table,"
O (Other)	"I forgot," "I don't know," "Look at it," "Didn't play," "Stare," "Looking at it," "It was in her hand… she played with it"
N (Nothing)	"I didn't see her do anything," "Nothing,"

Figures

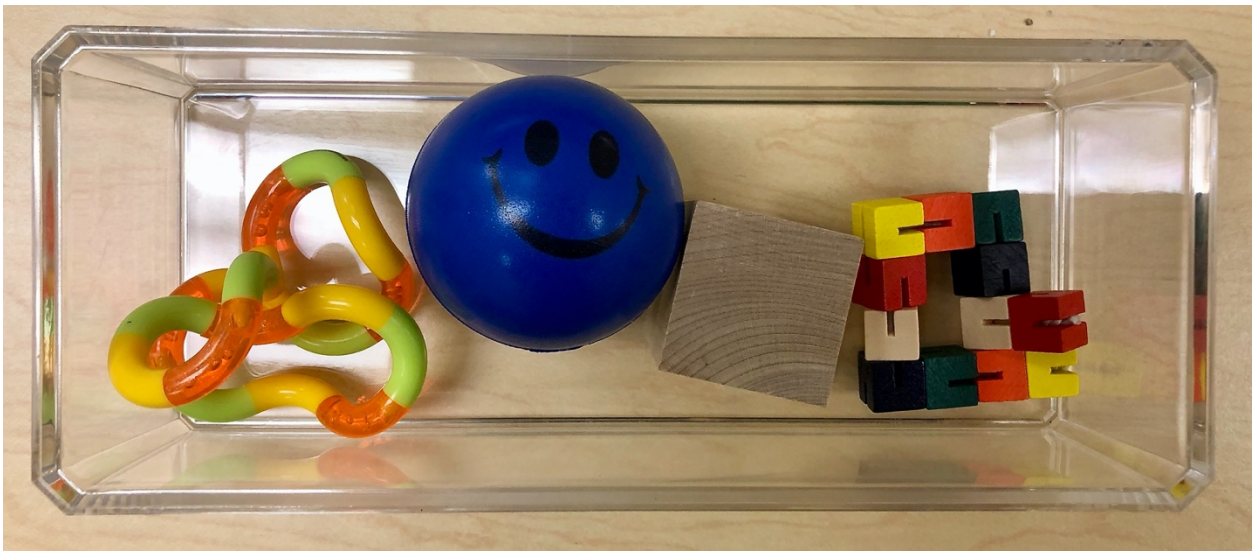

Figure 1. Four experimental toys. From left to right: infinity toy, distractor, block, string blocks.

Figure 2. Modified Likert scale. Toy ratings were coded 1-5, with a 1 being the far-left face and a 5 being the far-right face.

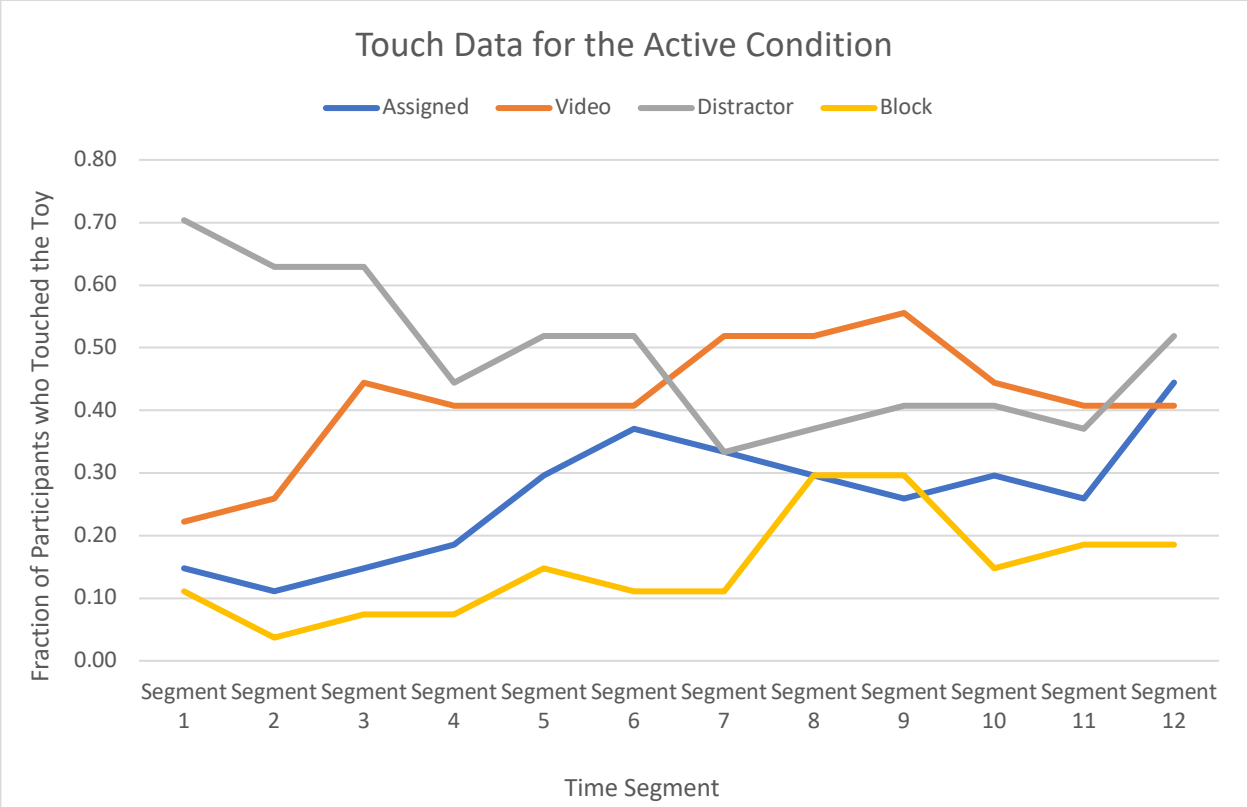

Figure 3. Graph displaying the change in the fraction of participants given the Active condition who made contact with each toy over the 60-second free play period.

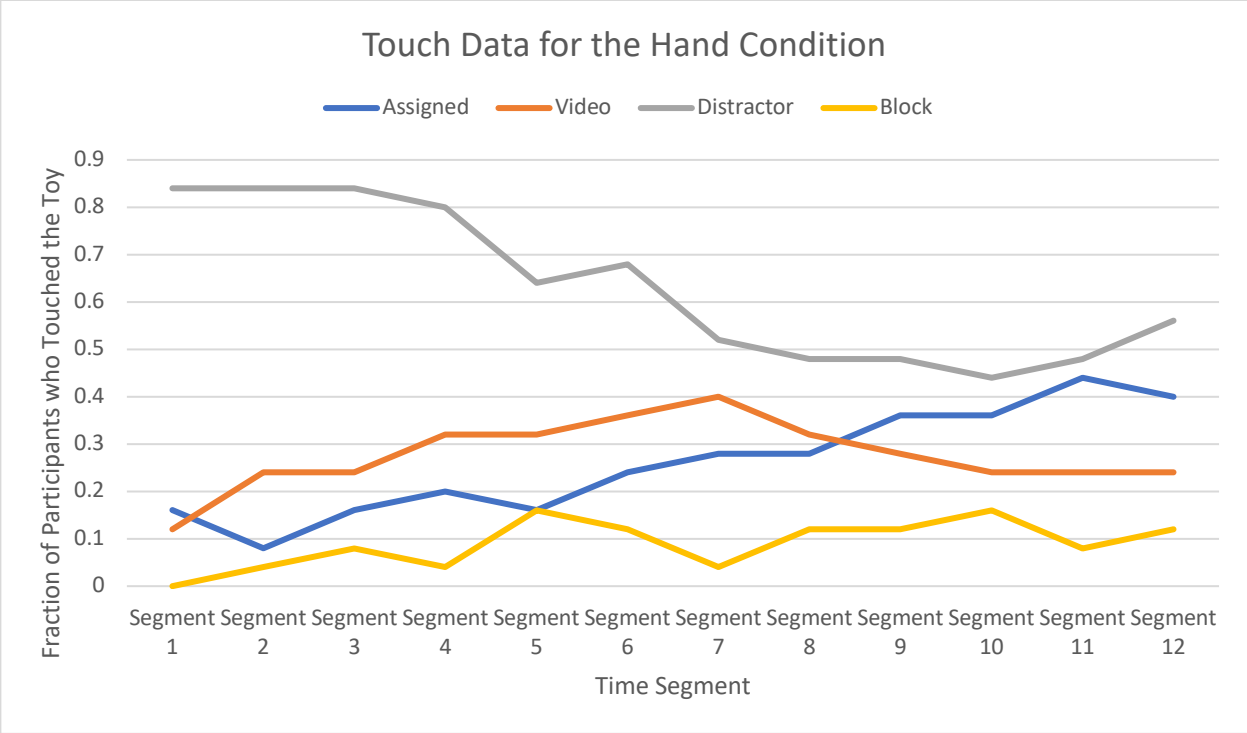

Figure 4. Graph displaying the change in the fraction of participants given the Hand condition who made contact with each toy over the 60-second free play period.

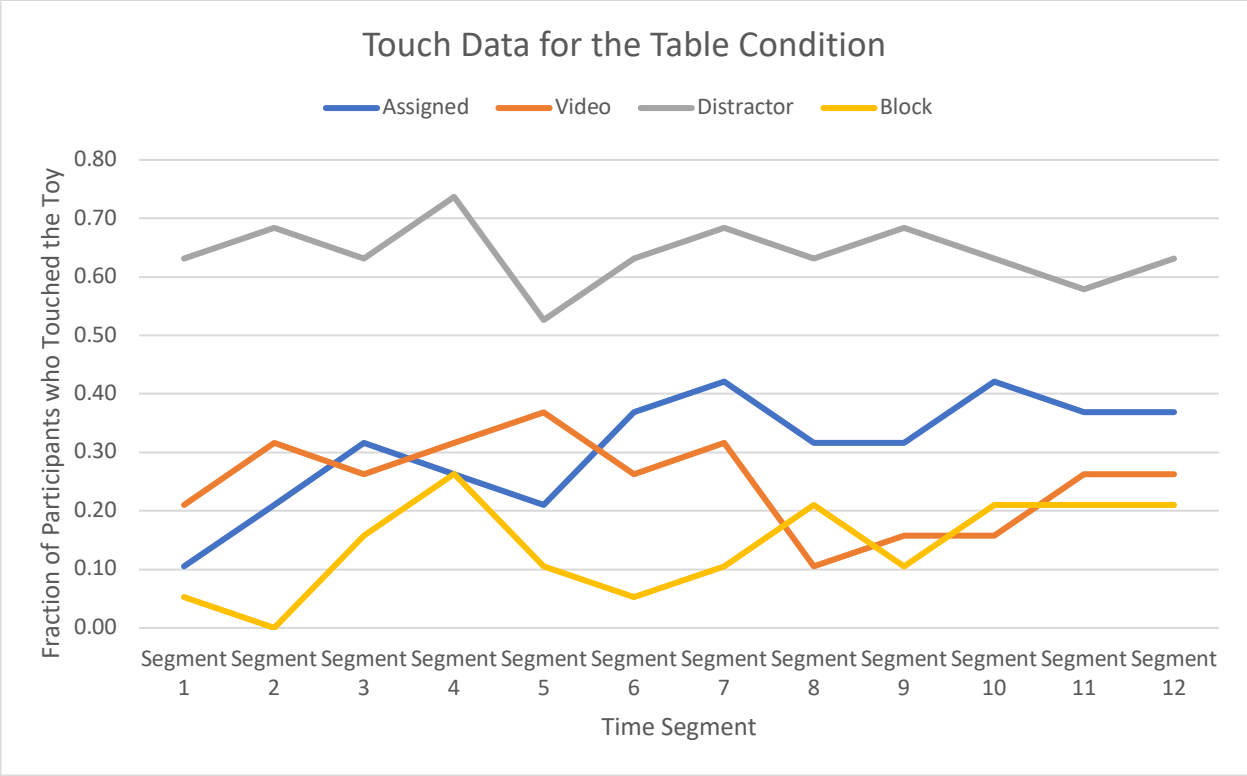

Figure 5. Graph displaying the change in the fraction of participants given the Table condition who made contact with each toy over the 60-second free play period.