

Using Computer Tablets to Assess Preference for Videos in Children With Autism

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Abstract

Using computer tablets, we assessed preference for videos in five children with autism spectrum disorder (ASD). Then, we provided access to most preferred and less preferred videos contingent on sitting on one of two chairs within a concurrent schedule design. All participants spent consistently more time sitting on the chair associated with the video selected the most often during the preference assessment, indicating that practitioners may use the tablet-based assessment procedure to identify potential video reinforcers for children with ASD in applied settings.

Keywords: autism, preference assessment, reinforcer, tablet, video

1. Prior to using video recordings as reinforcers, practitioners should assess preference.
2. Practitioners may use computer tablets to assess preference for videos in children with autism spectrum disorder.
3. To assess preference, practitioners can vertically split the screen of a tablet in two and present the videos within a paired-choice format.
4. The video selected the most often may be used as a potential reinforcer to teach novel behavior.

Using Computer Tablets to Assess Preference for Videos in Children with Autism

Researchers have shown that providing contingent access to videos may be effective at teaching and maintaining behavior in children with autism spectrum disorder (ASD; Davis, Fuentes, & Durand, 2014; Mechling, Gast, & Cronin, 2006). Given their increased availability and affordability, computer tablets are an interesting option for practitioners aiming to identify preferred videos as potential reinforcers. That said, research on assessing preference for videos is currently scarce. In a notable example, Dattilo (1986) conducted a computerized preference assessment to compare preference for auditory, visual, and tactile stimulation in children with intellectual disability. Each child showed clear preference for one type of stimulation, but the results are limited because the researchers provided visual and auditory stimulation separately (i.e., the videos were soundless) and did not conduct a subsequent reinforcer assessment.

More recently, studies have shown that preferred videos may be more effective reinforcers than tangible items (Clark, Donaldson, & Kahng, 2015; Mechling et al., 2006) and that video-based preference assessments may produce results consistent with tangible assessments (e.g., Snyder, Higbee, & Dayton, 2012). However, the previous studies did not compare the effects of highly preferred videos with less preferred videos, limiting conclusions that may be drawn from the data. Thus, the purpose of our study was to replicate and extend prior research by comparing the effects of most preferred and less preferred videos identified using a tablet-based preference assessment in children with ASD.

Method

Participants, Data Collection, and Interobserver Agreement

Five children with ASD between the ages of four and eleven years old participated in the study. All participants attended a specialized school for children with ASD who are not

integrated in inclusive settings due to their low level of adaptive functioning or high level of problem behaviors. The first author conducted all the sessions in two rooms within the school. During the preference assessment, two independent observers recorded which video the participant selected on each trial. Selection was defined as the participant touching the screenshot of the video on the computer tablet's screen. Both observers agreed on 100% of the video selections. During the reinforcement assessment, we videotaped the sessions and subsequently measured the duration that each child spent sitting on each of the two chairs. Sitting was defined as having one's buttocks on the chair. A second observer reviewed at least 33% of the sessions for each participant. We calculated interobserver agreement (IOA) using the block-by-block method with 10-s bins. Mean IOA was 99.4% (range, 98.7% to 100%) for Amy, 99.7% (range, 99.0% to 100%) for Fanny, 100% for Axelle, 100% for Carine, and 99.7% (range, 98.9% to 100%) for Corey.

Procedures

Preference assessment. First, each child participated in a modified paired-choice preference assessment (Fisher et al., 1992; Snyder et al., 2012) with a 25.7-cm (10.1-inch) touch computer tablet using the Windows 8.1 operating system. We used a paired-choice format because (a) the participants did not necessarily have the skills to make choices from a larger array and (b) the screenshots of the videos would have been difficult to discriminate if we fitted more than two on the screen. We assessed preference for six different 2.5-min videos on the following themes: animals, soldiers, Minnie Mouse, princess, Minions, and trains. We chose videos that varied in terms of themes and animations in order to accommodate children of different ages and gender. Each preference assessment lasted approximately 60 to 80 min in total; hence, we divided the assessment into two to four 20- to 30-min sessions depending on

child availability. With the exception of Axelle, we conducted each session on a different day. During the preference assessment, we presented each video with each other video twice and counterbalanced the side of presentation during the second presentation. The trainer presented the pairs in a random order, but made sure to present all possible combinations once before introducing pairs for a second time. During each trial, we loaded two videos using free media players for Windows 8.1 and then split the screen vertically into two areas of equal size so that the child saw two screenshots simultaneously.

At the beginning of the trial, we prompted the participant to touch one of the two screenshots resulting in the video displayed on that side to play immediately for 30 s. We then prompted the participant to touch the other screenshot, resulting in the second video playing immediately for 30 s. Following exposure to both videos, we asked the participant to choose one of the two videos by touching the associated screenshot. Touching one of the screenshots allowed the participant to view the associated video playing on its side of the screen for an additional 30 s. If the participant did not select a screenshot within 10 s, we repeated the previous sampling procedures. Failure to choose one of the two videos following resampling resulted in the trainer recording no choice and presenting the next pair in the same manner.

Reinforcer assessment. Following the preference assessment, we provided access to most preferred and less preferred videos contingent on sitting on one of two chairs within a concurrent schedule design. The most preferred video was the one selected the most often during the preference assessment and the less preferred video was the one selected the least often. Due to a procedural error, the less preferred video used for Axelle was not the one selected the least often, but actually a moderately preferred video. For Carine, two videos were identified as less

preferred. Thus, we randomly chose the one used as part of the reinforcer assessment in order to minimize the duration of assessment.

During each 5-min session, two identical chairs were placed 2 m apart, facing each other. Prior to starting the session, we prompted the participants to sit on the chair on one side and handed them a tablet playing the most preferred video for 30 s. We then prompted the participants to sit on the other chair and handed them another identical tablet displaying the less preferred video for 30 s. Following the presentation of both videos, we prompted the participants to stand up exactly between the two chairs. The two identical tablets were then placed on each chair and we asked the participants to choose a chair to sit on. Following the instruction, the participants were free to sit on either chair or remain standing in the room; participants could also switch chairs to access the other video. The position of the tablets playing the most preferred and less preferred videos was counterbalanced from one session to the next. Exposure to the video was conditional on sitting on the chair; when participants stood up from a chair, we took the tablet away, stopped the video and placed it back on the chair. When the video finished playing before the end of the session, the trainer restarted it from the beginning. Each session was followed by a 3-min break during which the participants either ate a snack or played with toys. Depending on availability, each child participated in one to three sessions per day. We continued conducting the reinforcer assessment sessions until we obtained three data points spread on at least two different days showing a clear and stable differentiation of sitting behavior.

Results and Discussion

Figure 1 presents the results of the preference (left panels) and reinforcer (right panels) assessments. Amy selected the Minions video the most often and the animals video the least often, and spent nearly all of each session sitting on the chair associated with the most preferred

video ($M = 99\%$). Fanny preferred the Minnie Mouse video the most and the animals video the least. She also spent most of the sessions sitting on the chair associated with the Minnie Mouse video ($M = 96\%$). Axelle chose the Minnie Mouse video the most frequently and the Minions and train videos the least frequently. We inadvertently used the soldiers video as the less preferred video. Axelle spent all her sessions sitting on the chair associated with the Minnie Mouse video ($M = 100\%$). Similarly, Carine selected the Minnie Mouse video the most often, but the Minions and princess videos the least often. We used the Minions video as the less preferred video for the reinforcer assessment. Carine spent all her sessions sitting on the chair associated with the Minnie Mouse video ($M = 100\%$). Finally, Corey also chose the Minnie Mouse video the most often and the train video the least often. With the exception of one session, he spent nearly all his time sitting on the chair associated with the Minnie Mouse video ($M = 86\%$). During session 5, Corey mostly ran around the room, lied on the floor while asking the trainer to play with him.

In sum, all participants spent a higher percentage of time sitting on the chair associated with the most preferred video than on the chair associated with the less preferred video. The present study extends previous research on using assessments to identify preferred videos for individuals with developmental disabilities (Dattilo, 1986; Mechling et al., 2006; Snyder et al., 2012). That is, we extended prior studies by showing that the results of a tablet-based video preference assessment predicted responding within a concurrent operant arrangement: the video selected the most often produced higher levels of sitting than a less preferred video. From a clinical standpoint, practitioners may thus consider adopting the procedures to identify preferred videos for use prior to implementation of reinforcement-based treatments. With the increased presence and affordability of tablets and their use for educational purposes, using computer

tablets to assess preference may expose children to a tool (i.e., tablet) that may also be used for other purposes, which may eventually reduce the clients' dependence on practitioners and favor greater social and educational integration.

Nevertheless, our study has some limitations that should be noted. First, we used a touch tablet with the Windows 8.1 operating system. However, practitioners should note that similar split screen functions are now available on some more recent Android-based tablets and on the new version of the operating system for iPad (iOS 9). Second, the preference assessment typically lasted 60 to 80 min, which may limit its application in certain contexts. In applied settings, one potential solution to this concern may be to present each possible pair only once, cutting the duration of the assessment in half. Alternatively, researchers could run a multiple stimulus without replacement to reduce the duration of the assessment (e.g., Brodhead, Al-Dubayan, Mates, Abel, & Brouwer, 2015). Third, we did not measure collateral behaviors during the assessments (e.g., problems behaviors, watching the video). Anecdotally, the participants nearly continuously looked at the tablet while videos were playing. However, we occasionally observed problem behaviors following the removal of the tablet, but escalation was usually avoided by redirecting the child's attention towards the next activity

As part of our study, we used an arbitrary behavior (i.e., sitting) as a dependent variable within a concurrent operant arrangement as all children already engaged in this behavior at school. In order to extend our results, researchers should examine the effectiveness of our procedures to identify reinforcers used within single-operant teaching conditions. Future research could also replicate our experiment with a larger number of participants and by varying the ranking of the videos compared within the concurrent operant arrangement in order to further examine the utility of the assessment procedures. Finally, researchers should consider assessing

preference for other technology-based activities such as playing video games, watching online videos, and using social media in future research.

Compliance with Ethical Standards

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Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical Approval: All procedures performed in this study were approved by the Research Ethics Board of the Faculté des arts et sciences of the Université de Montréal and were in accordance with the ethical standards of the Canadian Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Informed Consent: Informed consent was obtained from the parents of all individual participants included in the study.

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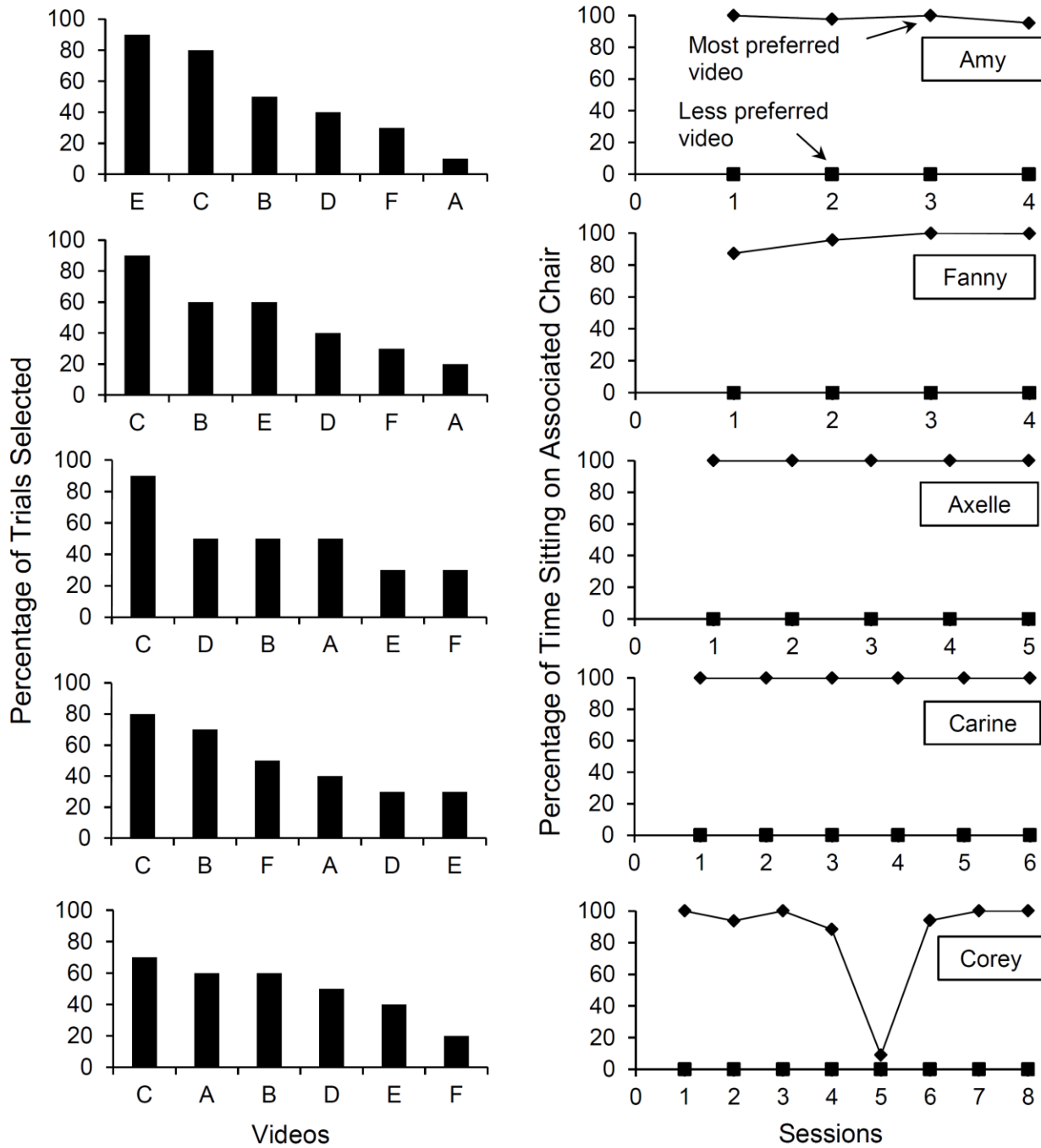


Figure 1. Percentage of trials the participants selected each video (left panels) and percentage of time spent sitting on the chairs associated with the most and less preferred videos (right panels).

A = animals, B = soldiers, C = Minnie Mouse, D = princess, E = Minion, F = trains.