Effects of Context on Physical Activity

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INTRODUCTION

The CDC (2010) recommends at least 60 minutes of physical activity a day to help reduce health risks. However, many children & teens do not meet this criterion, especially those with disabilities (WHO, 2018).

A number of behavior analytic studies have evaluated ways to increase physical activity. For instance, Hustyi et al. (2012) assessed the effects of environmental context on preschoolers' levels of moderate-to-vigorous physical activity (MVPA). Fixed playground equipment produced the highest levels of MVPA relative to outdoor toys, open space, and a sedentary toy control condition.

In a replication, Pincus et al. (2019) assessed effects of environmental context on MVPA emitted by adolescents with intellectual and developmental disabilities. All participants demonstrated the highest levels of MVPA in an exergaming condition. In a concurrent chains preference assessment, two of three participants preferred exergaming to sedentary activities.

Although the results of Pincus et al. (2019) were positive, there were some limitations. First, it is unclear if preference assessments were used to identify the sedentary activities. Second, in the activity preference assessment pictures were used to represent activities as opposed to GIFs (e.g., Morris & Vollmer, 2020).

The purpose of the current study was to replicate and extend Pincus et al. (2019), by including a preference assessment to identify preferred sedentary activities and using GIFs during the activity preference assessment.

METHOD

Participants, Setting and Materials

- Participants were three adolescents with intellectual and developmental disabilities between the ages of 16 and 20 years.
- All sessions were conducted in the school gym.
- Materials required:
  - *Gross Motor Toys* – Exercise ball, basketball, basketball hoop, jump rope
  - *Exercise Video* – Laptop (Just Dance ™ videos)
  - *Open Space* – No materials required
  - *Bicycle* – Adaptive Tricycle
  - *Control* – The two highest preferred sedentary activities, table, and chair

Dependent Variables and Data Analysis

- *MVPA* was defined as any translocation at a moderate to fast pace, excluding problem behavior (e.g. two repetitions of skipping or jumping).
- *Selection* was defined as pointing to the picture (sedentary preference assessment) or GIF (activity preference assessment).
- BDataPro (Bullock et al., 2017) was used to collect 10s partial interval data on MVPA during the activity analysis.
- Exact agreement interobserver agreement (IOA) was collected for 33% of sessions. Mean IOA was 97%.

Procedures

Sedentary Preference Assessment

- A concurrent chains paired choice preference assessment was used to evaluate preference for sedentary items.
- The participant was shown pictures of tabletop activities and were told to "pick one". Contingent upon a selection, the participant was provided 30 s of access to the item.
- Choices were presented until all combinations of items were presented once.

Activity Analysis

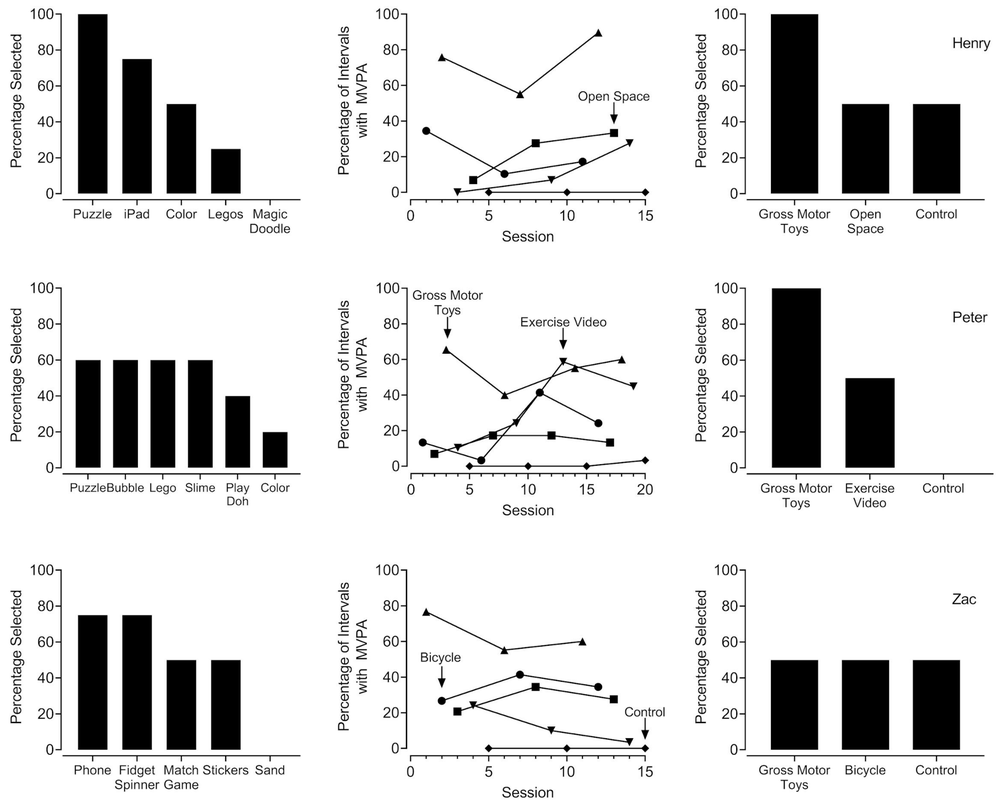
- A multi-element design was used to compare four test conditions and a control condition.
- All sessions were 5 min in length.
- At the start of each session, the experimenter presented the GIF associated with that condition on an iPad, and prompted the participant to touch the GIF.
- The experimenter provided an instruction that coincided with the condition (i.e. "play with the toys" for the Gross Motor Toys condition, or "ride the bike" for the Bicycle condition) and allowed the participant to interact with the session materials.

Physical Activity Preference Assessment

- A concurrent chains paired choice preference assessment was used to evaluate preference for the two activities with the highest levels of MVPA and the preferred sedentary items.
- The experimenter presented a pair of GIFs on an iPad and prompted the participant to "pick one". Contingent upon a selection, the participant was provided 3 min of access to the activity.
- Choices were presented until all combinations of activities were presented once.

Figure 1

Results of the sedentary preference assessment (left panel), activity analysis (center panel), and physical activity preference assessment (right panel) for each participant.



RESULTS & DISCUSSION

- For all participants, level of MVPA varied based on environmental context, with Gross Motor Toys producing the highest level of MVPA. In addition, MVPA occurred during at least 50% of intervals for all participants.
- During the Physical Activity Preference Assessment, two of three participants selected the Gross Motor Toys condition more often than preferred sedentary activities. The third participant selected all options equally.
- These results replicate those of Pincus et al. (2019) and extend the methods by incorporating a GIF based preference assessment.
- A limitation of this study was the sedentary preference assessment results for Peter. Four items were selected equally, thus it is unclear whether those items used in control were highly preferred.
- A second limitation was the undifferentiated results for Zac's Physical Activity Preference Assessment. One explanation is that the limited number of trials in the assessment increased the likelihood of undifferentiated results if preferences were similar. Future researchers should consider including all of the physical activities in the assessment.

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