Adapting Competing Stimulus Assessments for Multiply Maintained Destructive Behavior

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Introduction

- Competing stimulus assessments (CSAs) identify high-competition (HC) stimuli associated with reductions in challenging behavior (Frank-Crawford et al., 2023)
- Previous literature indicates presenting competing stimuli on a non-contingent schedule of reinforcement can reduce engagement in automatically maintained challenging behavior (Groskreutz et al., 2011; Roscoe et al., 2013)
- There is limited information on identifying CSAs for behavior multiply maintained by automatic and social reinforcement

The current study evaluates the use of a CSA to identify HC stimuli to decrease treatment resistant, high-magnitude challenging behavior. A functional analysis previously identified that the targeted behavior was multiply maintained by automatic and social reinforcement.

In addition, this study explored environmental modifications to eliminate barriers to safely completing assessments for high-magnitude challenging behaviors.

Method

Participant: 13-year-old male receiving center-based ABA services. Targeted behavior was property destruction multiply maintained by automatic and social reinforcement.

Setting and Materials: Environmental modifications made to client's designated classroom. Lightweight, inflatable items used to imitate seating, a table, and a trash can. Selected items eliminated barriers to safely completing assessment.

Potential competing stimuli were selected based on material composition and observed topographies of property destruction:

Stimulus	Description
Cardboard	5 medium sized broken-down cardboard boxes
Bubble Wrap	5 individual square sheets of bubble wrap
Velcro	10 strips of extreme adhesive Velcro attached to two laminated sheets of paper
Stickers	15 medium sized wall decal stickers on classroom wall
Ball Pit	Round foam "ball pit" with 20 blown up exercise balls
Hand Mop	Handheld "Swiffer" mop with cleaning pad and silicone cup filled with liquid

Dependent Variables

- Engagement with Competing Stimulus (Whole Interval Recording)
- Engagement in Property Destruction (Partial Interval Recording)

Experimental Design

Stimuli presented two times each. Presentations occurred once between 8:45 AM - 12:00 PM and once between 12:00 PM - 3:00 PM.

Baseline: Single 2-minute session prior to introducing stimuli; Furniture items present while client engaged with preferred leisure activity (YouTube)

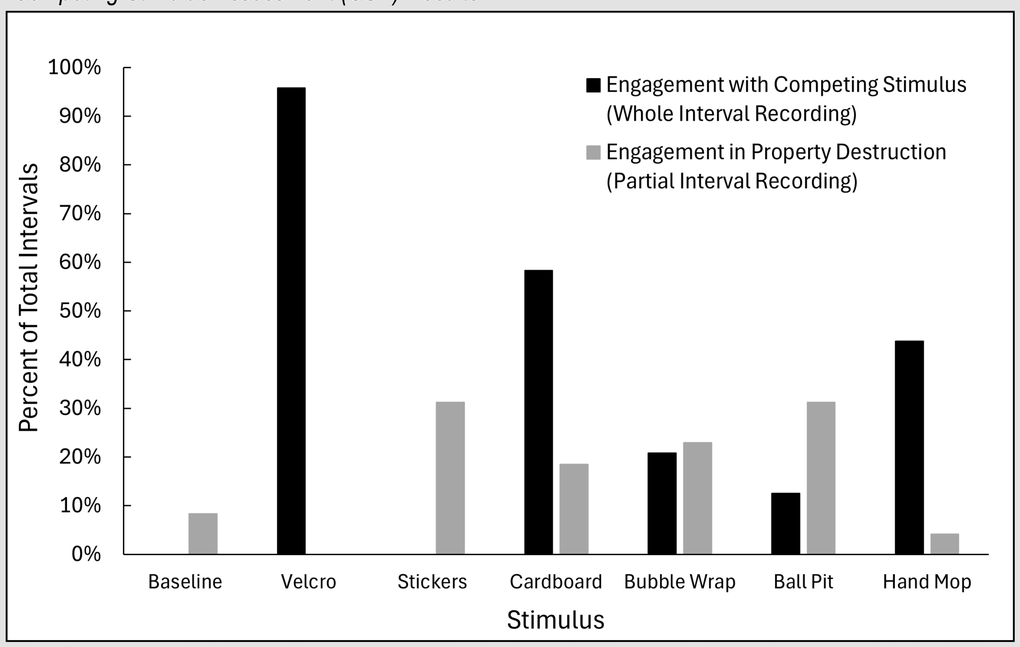
Stimulus Presentation: Two 2-minute sessions per stimulus (12 total) in randomly selected order; Staff presented designated item and stated "Here's ____ for you to play with;" Furniture was removed from room at end of each session

Praise provided VI 10-seconds for engagement with designated stimulus. Praise not provided during engagement in property destruction.

Results

Figure 1

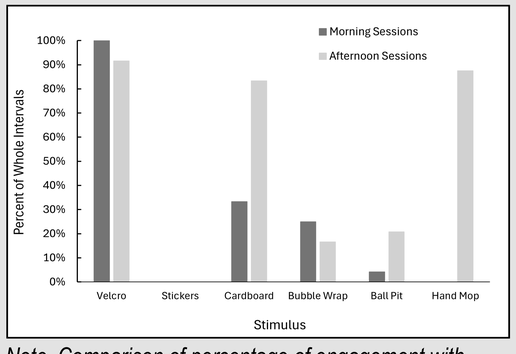
Competing Stimulus Assessment (CSA) Results



Note. Percentage of total intervals engagement with stimulus and/or in property destruction occurred during CSA. Percentage of total intervals calculated by averaging percentages from morning and afternoon sessions.

Figure 2

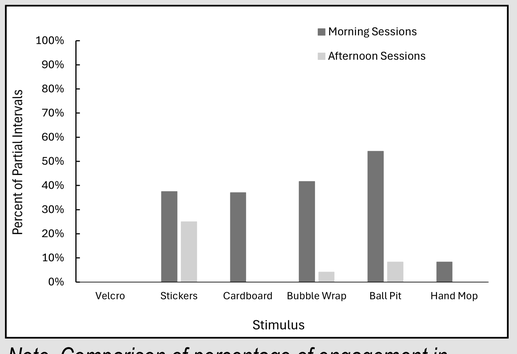
Comparison of Engagement with Competing Stimuli Across Stimulus Presentations



Note. Comparison of percentage of engagement with stimuli across sessions held during the morning versus the afternoon. Morning stimulus presentations occurred prior to afternoon stimulus presentations for all stimuli except for the hand mop.

Figure 3

Comparison of Engagement in Property Destruction Across Stimulus Presentations



Note. Comparison of percentage of engagement in property destruction across sessions held in during the morning versus the afternoon. Hand mop stimulus first introduced during afternoon session. All other stimuli presented during morning session prior to the afternoon session presentation.

Discussion

The CSA successfully identified HC stimuli for property destruction multiply maintained by automatic and social reinforcement. Barriers were successfully reduced by modifying environmental stimuli and materials.

Levels of engagement were significantly greater than and instances of property destruction significantly less than other stimuli when presented with the Velcro stimulus.

Ranking (High to Low)	Stimulus	% Intervals Engaged w/ Stimulus	% Intervals Engaged in Property Destruction
1	Velcro	95.8%	0%
2	Cardboard	58.3%	18.5%
3	Mop	43.8%	4.2%
4	Bubble Wrap	20.8%	22.9%
5	Ball Pit	12.5%	31.3%
6	Stickers	0%	31.3%

Interval-by-interval IOA data was collected for 92.9% of sessions and analyzed for 36% of sessions. IOA agreement was at 98.4% of intervals for engagement with the stimulus and 92.6% of intervals for engagement in property destruction (intervals agreed/total intervals x 100).

In sessions 8-12, client sat and waited until staff signaled end of session to pull "plug" on chair versus engaging during the 2-minute session

- Waiting may have occurred as a function of access to social reinforcement in the form of watching staff remove furniture immediately following engagement in behavior
- Vocal prompt to reengage with stimulus paired with a model added for sessions 11-13 due continuously sitting in the absence of engagement with the stimulus and/or in property destruction

CSA adaptations are essential to successfully identify HC stimuli for high-magnitude and/or multiply maintained challenging behaviors.

Future research should evaluate the use of a parametric analysis to identify appropriate levels of reinforcer consumption for HC stimuli (Roscoe et al., 2003). Parametric analyses may serve as a tool for determining an appropriate magnitude or amount of exposure to a HC stimulus to effectively lower rates of challenging behavior.

References

Frank-Crawford, M. A., Hagopian, L. P., Schmidt, J. D., Kaur, J., Hanlin, C. & Piersma, D. E. (2023). A replication and extension of the augmented competing stimulus assessment. *Journal of Applied Behavior Analysis, 56*(4), 869-883. https://doi/org/10.1002/jaba.1009

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Roscoe, E. M., Iwata, B. A., & Rand, M. S. (2003). Effects of reinforcer consumption and magnitude on response rates during noncontingent reinforcement. *Journal of Applied Behavior Analysis, 36*(4), 525-539. https://doi.org/10.1901/jaba.2003.36-525

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