



Examining How Music Interferes with Imitation: Contrasting Cognitive Load with Selective Attention

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Introduction

- Videos and television shows aimed at infants are becoming increasingly popular. Infants as young as 6-months-old can imitate a televised model (Barr, Muentener, & Garcia, 2007).
- Infants learn less from a televised model than from a live model. This is known as the video deficit effect (Anderson & Pempek, 2005).
- Video demonstrations used in experiments now use the formal features of television programs, such as sound effects and music. Six- to 18-month-olds performed above baseline with sound effects, but they did not enhance performance (Barr, Wyss, Somanader, & Linebarger, under revision).
- Six- to 18-month-olds demonstrated a video deficit effect when a background music soundtrack was added and 12-month-olds did not perform above baseline when music was added to a live demonstration (Barr, Shuck, Salerno, & Linebarger, in preparation).
- In the current studies, we attempt to eliminate the interference of music either by increasing selective attention to the target actions with sound effects or decreasing cognitive load with habituation to the music soundtrack.

Method

Experimental Stimuli: Participants were tested with one of four puppets.



Rabbit Mouse Cow Duck

Experiment 1: Add Sound Effects

Participants: 93 6-, 12-, and 18-month-olds

Procedure: Each infant was randomly assigned to either the full mix or baseline group. Sound effects matched to the target actions and the music soundtrack were added to the videotaped demonstration for the full mix group. Each infant was randomly assigned to either the full mix or baseline group. Infants in the baseline group did not see a demonstration of the target actions.

Experiment 2: Habituation

Participants: 30 12-month-olds

Procedure: Each infant was randomly assigned to either the live habituation or baseline group. The soundtrack was played for 10 minutes in the home prior to the demonstration and test for the habituation group. Infants in the baseline group did not see a demonstration of the target actions.

Experimental set-up



Demonstration



Test

Results

Demonstration: % looking time was high (>85%) for all participants in both experiments.

Test: A 3-point scale (remove, shake, and replace the mitten) was used to calculate an imitation score for each infant. Performance of experimental groups was compared to a baseline control.

Experiment 1:

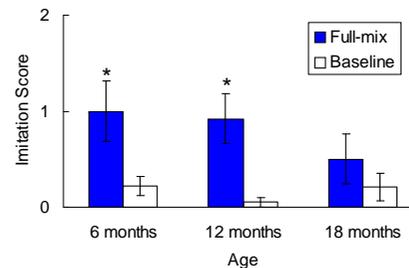


Figure 1. The mean imitation score ($\pm 1SE$) for infants in the full-mix condition as a function of age. An asterisk denotes that the group performed significantly above baseline.

Experiment 2:

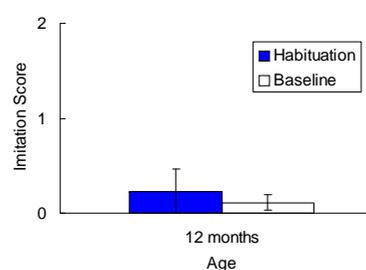


Figure 2. The mean imitation score ($\pm 1SE$) for 12-month-olds in the habituation condition.

Discussion

- Sound effects did not hinder performance and actually enhanced the performance of 6- and 12-month-olds. This suggests that music interferes with selective attention.
- Habituation did not affect 12-month-olds' performance with a live music condition. Decreasing the overall cognitive load is not sufficient to overcome the interference of music.

Future Directions:

- Test habituation with 18-month-olds: Explore whether habituating 18-month-olds to the music prior to a video demonstration alleviates the interference of music (as adding sound effects was unsuccessful).
- Test selective attention conclusion: Explore whether the addition of salient features other than sound effects help remove the interference of music.

Practical Applications:

- This is compelling evidence that, without the help of perceptually salient features like sound effects, young infants find it more difficult to learn and remember information presented on videos that include music.
- Although imitation from videos has been demonstrated in young infants, the more the demonstrations are made like television, the more complex the learning environment.

References

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