Infants' Detection of the Affordances of Everyday Objects

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Abstract

Prior research has demonstrated that young infants are able to perceive the affordance, or the potential for action, provided by the physical layout of their environment. Little, if any research, however has been conducted to determine whether infants can detect the potential for action provided by ordinary household objects. A prior study conducted in our lab demonstrated that 5.5 month-old infants were able to perceive the affordances of common objects. The present research sought to replicate and extend these findings. It assessed the ability of infants to detect the affordances of objects (correct versus incorrect use) without the benefit of habituation/familiarization trials. Sixteen infants participated in a two-screen preference procedure. Infants viewed two videos side by side, one depicting an action with a correctly used object and the other, the same action with an incorrectly used object, across 8 30-s trials Results showed that infants spent a significantly greater proportion of time looking to the incorrectly used object across all trials, according to a single sample t-test ($p < .05$). These results suggest that infants perceive affordances of everyday objects without the benefit of familiarization with the particular objects. Infants appear to perceive affordances by detecting invariant relations between distinctive features of objects and their actions and/or generalizing from past experiences with similar object-action relations.

Introduction

According to Gibson's ecological view of perceptual development, infants are active perceivers and can perceive the affordances of objects early in development (Adolph, Eppler, and Gibson, 1993; Gibson, 1969). An affordance is A potential for action and is a property of the relation between the organism and the environment. Prior research has demonstrated that young infants are able to perceive the affordances provided by the physical layout of surfaces in their environment, including those that support locomotion, those that afford falling, and those that afford collision versus passing though. Little, if any research, however, has been conducted to determine whether infants can detect the potential for action provided by ordinary household objects. A prior study in our lab addressed this question. We demonstrated that 5.5 month-old infants were able to perceive the affordances of common objects. Infants were habituated to a video of a woman performing an everyday activity with a common object used correctly (e.g. brushing hair with a hair brush). Results of test trials demonstrated that infants discriminated between a novel object used correctly versus a novel object used incorrectly in the familiar activity (e.g. brushing hair with a comb versus a glass). The present research sought to replicate and extend these findings. It assessed the ability of infants to detect the affordances of objects (correct versus incorrect use) without the benefit of habituation/familiarization trials.

Stimulus Events

Color video films used in our prior study depicted a woman performing repetitive, everyday activities with common objects. Four activities (brushing hair, eating, drinking, and washing the face) were shown, each depicting the woman using two objects correctly to accomplish the goal (e.g., eating with a spoon or with a fork) and two objects incorrectly to accomplish the goal (e.g., eating with a washcloth or with a sponge; see Figure 1). There were 16 different events and each object was used correctly in one activity and incorrectly in another activity.

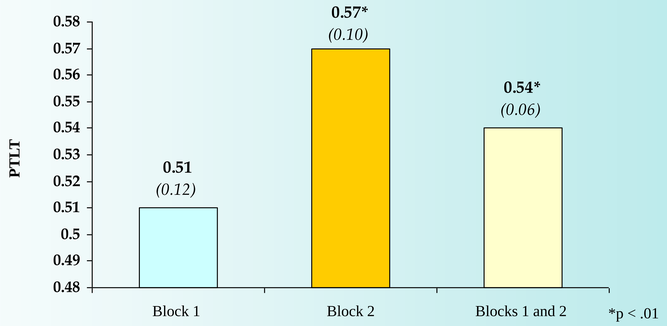
Procedure

Sixteen 5½-month-old infants participated in a two-screen preference procedure. The objects and events were the same as those used in the prior study (brushing hair, eating, drinking, washing face). For each action there were two objects which were appropriate and two that were inappropriate to the actions (e.g. brushing hair with a brush or comb versus a cup or wineglass). Infants viewed two videos side by side, one depicting an action with a correctly used object and the other, the same action with an incorrectly used object, across 8 30-s trials. Stimulus event pairs and lateral positions of the correctly versus incorrectly used objects were counterbalanced across infants. The proportion of total looking time (PTLT) to the incorrectly used object served as the dependent variable.

Figure 1

Figure 2

Proportion of Total Looking Time (PTLT) to the incorrectly used object



Results

Results supported our hypothesis and demonstrated that infants spent a significantly greater proportion of total looking time to the incorrectly used object across all trials and across trials in Block 2 alone, according to single sample t-tests ($p < .05$).

Conclusions

These results extend those of our prior study and demonstrate that 5.5-month-old infants can detect the affordances of common objects. Further, they can do so without the benefit of familiarization with the particular objects. Infants appear to perceive affordances by detecting invariant relations between the distinctive features of the objects and the actions and/or generalizing from past experiences with similar object-action relations.

References

Adolph, K.E., Eppler, M.A., & Gibson, E.J. (1993). Development of perception of affordances. In C. Rovee-Collier & L.P. Lipsitt (Eds.). *Advances in Infancy Research.* (*Vol. 8*, pp.51-98). Norwood, NJ: Ablex.

Gibson, E.J. (1969). *Principles of perceptual learning and development*. New York: Appleton-Century Crofts.

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