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Toddlers' imitative learning in interactive and observational contexts: The role of age and familiarity of the model ☆

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ABSTRACT

Three experiments examined the effects of age and familiarity of a model on toddlers' imitative learning in observational contexts (Experiments 1, 2, and 3) and interactive contexts (Experiments 2 and 3). Experiment 1 ($N = 112$ 18-month-old toddlers) varied the age (child vs. adult) and long-term familiarity (kin vs. stranger) of the person who modeled the novel actions. Experiment 2 ($N = 48$ 18-month-olds and 48 24-month-olds) and Experiment 3 ($N = 48$ 24-month-olds) varied short-term familiarity with the model (some or none) and learning context (interactive or observational). The most striking findings were that toddlers were able to learn a new action from observing completely unfamiliar strangers who did not address them and were far less likely to imitate an unfamiliar model who directly interacted with them. These studies highlight the robustness of toddlers' observational learning and reveal limitations of learning from unfamiliar models in interactive contexts.

Introduction

Any parent of a young child will attest that children learn through observation and incidental learning many words and actions they are not directly taught. Yet many if not most experimental

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studies of early learning involve interactions in which a child directly engages with an adult "teacher" with mutual gaze, joint attention, and contingent interaction. The pedagogical cues present in these situations have been considered beneficial (Tomasello & Farrar, 1986), and even necessary (Gergely & Csibra, 2005), for some types of learning to take place. According to this view, observational learning should be quite difficult for young children. However, a growing body of experiments has demonstrated that very young children are in fact able to learn from observing others' interactions (Akhtar, 2005; Akhtar, Jipson, & Callanan, 2001).

Children as young as 18 months can learn novel words (Floor & Akhtar, 2006; Gampe, Liebal, & Tomasello, 2012; Shneidman, Sootsman Buresh, Shimpi, Knight-Schwartz, & Woodward, 2009) and novel actions (Herold & Akhtar, 2008; Matheson, Moore, & Akhtar, 2013) from third-party interactions. Imitating novel arbitrary actions (e.g., using one's forehead to turn on a light; Meltzoff, 1988) is of particular interest because it has been hypothesized to play an important role in cultural learning (Gergely & Csibra, 2006). Although recent studies demonstrate an early ability to learn novel actions from third-party interactions, they have not directly examined the factors that influence this type of learning.

The current experiments manipulated factors that have been proposed to influence imitation in interactive contexts—namely, similarity of the model to the child in terms of age (child vs. adult) and familiarity of the model—to examine whether they also play a role in observational learning of novel actions. These factors may facilitate imitative learning by increasing children's identification with and affiliation with the model, respectively. In the following subsections, we provide the theoretical rationales for these hypotheses, review studies that have manipulated age and familiarity of the model in interactive contexts, and describe the current experiments and hypotheses.

Identification

Children's identification with the model is hypothesized to facilitate imitative learning (Meltzoff, 2005, 2007; Moore, 2006; Over & Carpenter, 2011; Uzgiris, 1981). According to Meltzoff, infants' recognition of others as like them enables early imitation. The process of identifying with the model may initially be based on relatively low-level processes. The motor resonance theory of imitative learning (Paulus, Hunnius, & Bekkering, in press) contends that infants' imitation is influenced by an implicit comparison of the model's actions with those in their own repertoire. If imitation is facilitated by identifying with the model, then a model who is similar to children will increase identification and, as a result, increase imitation. Support for the identification hypothesis comes from a recent study demonstrating toddlers' selective imitation of a person who spoke their native language over someone who spoke a foreign language (Buttelmann, Zmyj, Daum, & Carpenter, 2013).

Moore's (2006) hypothesis is similar in that he argued that toddlers' understanding of "self–other equivalence"—the understanding that the self and others have both first-person experiences and third-person characteristics—supports their ability to learn from third-party interactions. In essence, the hypothesis is that the ability to project oneself into a third-party interaction enables learning from it. Herold and Akhtar (2008) found some correlational support for this hypothesis in that two measures of self–other equivalence (perspective taking and mirror self-recognition) predicted toddlers' imitation of a novel arbitrary action from a third-party interaction. Factors that increase the model's similarity to the child may aid the child's recognition of self–other equivalence and thereby support observational learning.

Several studies suggest that, in interactive contexts, infants and toddlers are more likely to imitate children (i.e., those who are similar to them in age and size) than adults (Hanna & Meltzoff, 1993; Ryalls, Gul, & Ryalls, 2000; Zmyj, Aschersleben, Prinz, & Daum, 2012; Zmyj, Daum, Prinz, Nielsen, & Aschersleben, 2012). It is not currently known whether model age also plays a role in observational learning because all of the existing studies of early observational learning have involved adult models. In Experiment 1, we varied the age of the model (adult or child) in an observational learning context. The hypothesis was that toddlers would be more likely to imitate those similar to them in age, both unfamiliar children and their own siblings.

Siblings are particularly interesting as models because they not only are similar in age but also are highly familiar social partners who young children are likely to both identify with and affiliate with.