



Original Article

Task-specific effects of ostracism on imitative fidelity in early childhood[☆]Rachel E. Watson-Jones^{a,*}, Cristine H. Legare^a, Harvey Whitehouse^b, Jennifer M. Clegg^a^a University of Texas at Austin, Department of Psychology^b University of Oxford, Institute of Cognitive and Evolutionary Anthropology

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ABSTRACT

This study examined task specific effects of third-party ostracism on imitative fidelity in early childhood ($N = 96$, 3–6-year-olds). Start- and end-states of action sequences were manipulated to examine the effects of priming third-party ostracism versus affiliation on children's imitation of instrumental (i.e., action sequence with a different start- and end-state) versus social convention (i.e., action sequence with an identical start- and end-state) tasks. Children's performance was coded for imitative fidelity and children's explanations for their behavior. As predicted, imitative fidelity was highest and social convention explanations were most common when primed with ostracism in the social convention task. The data are consistent with our proposal that imitation serves an affiliative function in response to the threat of ostracism, a response amplified for social conventions.

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1. Introduction

The development of instrumental skills based on physical-causal rationales is a central task of early childhood learning (Gergely & Csibra, 2003; Whiten, McGuigan, Marshall-Pescini, & Hopper, 2009; Nielsen & Tomaselli, 2010). Previous research on instrumental imitation has demonstrated that children imitate goals hierarchically (Byrne & Russon, 1998; Carpenter, Call, & Tomasello, 2005; Williamson & Markman, 2006). For example, although children are most likely to imitate an end-goal in an action sequence (Bekkering, Wohlschläger, & Gattis, 2000), when an end-goal is not apparent or salient, children will imitate the means, perhaps because the means (or movements) become the goal (Carpenter et al., 2005; Schachner & Carey, 2013). Gergely and colleagues have proposed the principal of rationality in action interpretation to explain this behavior, asserting that infants use the most efficient means to reach a goal given knowledge of means, goals, constraints, and relevance (Gergely, Bekkering, & Kiraly, 2002; Gergely & Csibra, 2003; Kiraly, Csibra, & Gergely, 2013).

In contrast, other research has shown that children will “over-imitate” obviously causally irrelevant aspects of an action sequence even when they are aware that the behavior is irrelevant to achieving an end-goal (Horner & Whiten, 2005; Nielsen, 2006; McGuigan,

Whiten, Flynn, & Horner, 2007; Over & Carpenter, 2009; Nielsen & Tomaselli, 2010; Kenward, Karlsson, & Persson, 2011; Nielsen & Blank, 2011; Nielsen, Moore, & Mohamehdally, 2012). Although overimitation has been interpreted as a search for physical-causal rationales (Lyons, Young, & Keil, 2007), Heyes and colleagues have argued that imitation is not reliant on goal encoding, either as physical end-states (Bird, Brindley, Leighton, & Heyes, 2007) or as intentions (Leighton, Bird, & Heyes, 2010).

Social accounts of overimitation propose that children engage in high fidelity imitation as a means of demonstrating shared intentions with the experimenter (Tomasello, Carpenter, Call, Behne, & Moll, 2005; Over & Carpenter, 2012). Kenward et al. (2011) and more recently, Keupp, Behne, and Rakoczy (2013), have argued that children may be biased toward encoding both causally relevant and irrelevant actions not as causally efficacious in some way, or to demonstrate shared intentions, but to conform to normative conventions.

We define conventions, such as rituals, as causally opaque, socially shared actions (Herrmann, Legare, Harris, & Whitehouse, 2013; Legare & Herrmann, 2013; Legare & Souza, 2012, 2014). We propose that start- and end-state equivalency of an action sequence prompts the interpretation that the observed actions are unknowable from a physical-causal perspective and thus, conventional. Because conventions are socially motivated, there is no better or more correct way to reproduce them than exactly the way they were demonstrated. In contrast, when actions result in a distinct end-state, the action sequence is interpreted as having an instrumental goal and a potentially knowable causal structure. Thus, in the current research we differentiate conventional interpretations of action from instrumental interpretations of action by taking the novel theoretical perspective that children can interpret the nature of action sequences (conventional or

[☆] The raw data associated with the current research may be found on the Cognition, Culture, and Development Laboratory's website.

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instrumental) based upon whether or not the sequence contains an end-state that is the same or different from the start-state.

Here we build upon normative and social accounts of imitation by providing information about the affiliative motivation and function of imitating conventional behavior. To do this we examined the differential impact of priming third-party ostracism on children's imitation of instrumental versus social conventional actions. Recent research suggests that even 2-year-old children imitate social convention tasks more faithfully than instrumental tasks (Yu & Kushnir, 2013). These data are consistent with the proposal that whereas learning an instrumental skill allows for variability and innovation in methods of execution, learning social conventions requires close conformity to the way other group members perform the actions (Herrmann et al., 2013). We propose that research on the social function of imitation should be interpreted in light of the general human desire to affiliate (Brewer, 2007). In particular, we argue that the desire to affiliate goes beyond specific interaction partners to a desire to demonstrate affiliation with an imagined group marked by social conventions. Because instrumental acts do not carry as much “social weight” as conventional acts, ostracism may have a greater impact on children's imitation of social conventions.

The adaptive value of group membership has created an early-emerging sensitivity to ostracism resulting in behaviors aimed at promoting an individual's inclusion within a group (Buss, 1990; Caporael, 1997; Buss & Kenrick, 1998; Williams, 2007; Williams & Nida, 2011). There is also evidence that young children are sensitive to ostracism and use imitation as a behavioral strategy to address the negative effects of social exclusion. Over and Carpenter (2009) found that children primed with ostracism were more likely to copy the irrelevant actions of a demonstrator than children in a control condition. Whereas this work provides evidence that priming ostracism increases children's imitative fidelity in a task with an instrumental goal (i.e. turning on the light in a puzzle box), it did not examine task-specific effects of how priming ostracism may affect children's imitation of instrumental versus conventional behavior. This is noteworthy in light of evidence that children imitate with higher fidelity after observing a conventional task as opposed to an instrumental task (Herrmann et al., 2013).

We hypothesized that the motivation for imitating social conventions when faced with the threat of ostracism is to seek affiliation through social conformity or high fidelity imitation. Consistent with this hypothesis, Over and Carpenter (2009) demonstrated that the elements of their novel action sequence that were most reliably copied following ostracism priming were the causally irrelevant or “conventional” elements. For example, children in the ostracism and control conditions were equally likely to reproduce the angle of the tool used in achieving an instrumental goal, whereas children in the ostracism condition were more likely to reproduce the conventional action of rolling the tool between one's hands. Over and Carpenter's (2009) task involved a clear goal (turning on a light in a puzzle box). Using this paradigm precludes determining if children's imitative fidelity was influenced by the children's desire to affiliate with the model, achieve the goal, or engage in a social convention. Our aim is to disambiguate the interpretation of an instrumental goal from a conventional goal within the task. By differentiating these interpretations within our paradigm we can examine the effects of affiliative motivations on imitation without conflating instrumental and conventional interpretations of the actions.

A 2 × 2 between-subjects design was used to prime either ostracism or affiliation prior to watching a video demonstration of either a social convention or instrumental task using modifications of minimal priming stimuli developed by Over and Carpenter (2009). Children participated in one of four conditions: *ostracism–convention*, *affiliation–convention*, *ostracism–instrumental*, and *affiliation–instrumental*. Affiliation was chosen as a strong control for ostracism because it provides the same amount of social information but does not depict exclusion (see

Williams, 2007). To manipulate children's interpretation of the action sequence we used start- and end-state equivalency (social convention) or difference (instrumental). Both action sequences used in the current study (conventional and instrumental) are opaque from a physical–causal perspective but vary based on difference or equivalency of start- and end-states. Our methodology is distinct from that used in previous research because all of the actions are necessarily irrelevant in achieving any concrete goal. There is only the inference of a potential goal associated with the distinct end-state in the instrumental conditions. This allows us to examine the imitation of purely conventional actions from actions that have a potentially instrumental goal. We predicted that imitative fidelity would be highest and that children would provide more social convention explanations for their behavior in the ostracism–convention condition. Conversely, we predicted that imitative fidelity would be lowest and that children would provide fewer social convention explanations within the affiliation–instrumental condition. In line with previous research on overimitation (Lyons et al., 2007; McGuigan et al., 2007; Nielsen & Tomaselli, 2010; Herrmann et al., 2013), we predicted that 5–6-year-olds would engage in higher imitative fidelity than 3–4-year-olds, a finding that may be due to increasing sensitivity to social convention with age.

2. Method

2.1. Participants

Forty-eight 3–4-year-olds (mean age = 3.61; range 3,0 to 4,11) and forty-eight 5–6-year-olds (mean age = 5.54; range 5,0 to 6,11), ($N = 96$, 45 female) were recruited from a university town in the American southwest. Participants were primarily Euro-American and from middle-class families.

2.2. Materials

2.2.1. Video primes

Video primes were created using animation tools within PowerPoint software. The priming stimuli consisted of short videos depicting geometric shapes moving on the screen, with no audio. The videos were designed to depict ostracism and affiliation. The ostracism prime consisted of three blue pentagons that entered the screen and appeared to interact as a group. Subsequently, a fourth pentagon entered and approached the group. The group moved away from the fourth pentagon four times in a manner suggesting exclusion. The fourth shape then “gives up”, moved away from the group and stopped at the bottom left corner of the screen (Over & Carpenter, 2009). The affiliation prime matched the movements and timings of the ostracism prime. Four blue pentagons entered the screen together and appeared to interact as a group. The four pentagons moved to different areas of the screen as a group four times. Finally, two pentagons split off and moved to the lower left corner, while the other two moved to the upper right corner of the screen (see Fig. 1).

2.2.2. Object Set for video demonstration and imitation task

A set of objects was manipulated in a videotaped novel action sequence. In the convention conditions, the stimuli included a blue cube, orange sphere, purple piece, wooden peg-board (with three wooden pegs, colored yellow, red, and green), and silver box. The stimuli in the instrumental conditions were identical to the convention conditions except for the addition of a red pipe (see Figs 2 and 3). Object manipulation demonstrations were filmed for the convention and instrumental conditions for continuity in presentation to participants. Each video was 40 s in length.

Each participant watched a video demonstration of an action sequence in which the start- and end-states were either equivalent (convention conditions) or different (instrumental conditions).

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