



Stick to the script: The effect of witnessing multiple actors on children's imitation



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ABSTRACT

What kinds of cues increase imitative fidelity in early childhood? The effects of multiple models and verbal framing were examined in preschool children ($N = 259$, 3–6-year-olds). Each participant was presented with one of eight possible combinations of type of modeling and verbal frame. The type of modeling involved: (i) a single model offering two demonstrations, (ii) two successive models each offering a single demonstration, (iii) two synchronous models each offering two demonstrations, or (iv) two synchronous models each offering a single demonstration. The verbal frame preceding the demonstrations emphasized either the instrumental outcome of the actions or their conventionality. Imitative fidelity was highest for the synchronous models (types iii and iv) and lowest for the single model (type i). Imitative fidelity was also higher for the convention-oriented than the outcome-oriented frame and higher for older than younger children. Children also provided more conventional explanations for their actions after viewing the synchronous models and after the convention-oriented framing. The results indicate that children's imitative fidelity depends on the number of actors and the way the actions are framed.

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1. Introduction

Children use imitation to acquire both instrumental skills (Carpenter, Call, & Tomasello, 2005; Woodward, 2009) and social conventions (Churchland, 2011; Harris, 2012; Kashima, 2008; Kenward, Karlsson, & Persson, 2011; Over & Carpenter, 2012; Preston & de Waal, 2002) through a process of social learning (Tomasello, Carpenter, Call, Behne, & Moll, 2005). To be effective and efficient learners, children must be selective about when to imitate, when to innovate, and to what degree. Despite the vast literature on early imitation, little is known about how children use social cues to determine when the behavior of

others provides an opportunity for instrumental vs. conventional learning.

Children are indeed instrumental imitators (Gergely, Bekkering, & Király, 2002; Want & Harris, 2002; Williamson, Meltzoff, & Markman, 2008) yet causal reasoning is not integral to all imitative behavior (de Waal & Ferrari, 2010; Heyes, 2009; Leighton, Bird, & Heyes, 2010). Beyond instrumental skills, children must also learn cultural conventions such as socially shared beliefs, values, norms, and practices (Harris, 2012; Kashima, 2008; Legare et al., 2012; Rogoff, 1990).

High fidelity imitation has been linked to core social concerns (Nielsen, 2006; Uzgiris, 1981), such as encoding normative behavior (Kenward, 2012; Kenward et al., 2011; Keupp, Behne, & Rakoczy, 2013), affiliation (Churchland, 2011; Kashima, 2008; Kitayama & Cohen, 2010; Over & Carpenter, 2012; Preston & de Waal, 2002), shared experience (Tomasello et al., 2005), and fear of

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ostracism (Lakin, Chartrand, & Arkin, 2008; Over & Carpenter, 2009). Much cultural learning in human societies is motivated by affiliative goals, resulting in the acquisition of social conventions rather than instrumental behavior.

There is evidence that even preschool children are able to adjudicate between situations in which social conventions are called for and those in which they are not. For example, they protest when the rules of a novel game are broken (Rakoczy, Brosche, Warneken, & Tomasello, 2009; Rakoczy, Warneken, & Tomasello, 2008) or social role conventions are violated (Carter & Patterson, 1982; Levy, Taylor, & Gelman, 1995). Moreover, children are sensitive to context when they evaluate actions and flexibly respond to variation in social information (Kavanagh, Suhler, Churchland, & Winkelman, 2011; Mesoudi, 2009; Rakoczy et al., 2009; Schmidt, Rakoczy, & Tomasello, 2011; Schmidt, Rakoczy, & Tomasello, 2012).

We propose that the psychological systems supporting the learning of instrumental skills vs. learning cultural conventions are facilitated by the use of two cognitive stances (i.e., interpretive modes). The first is an *instrumental stance* – seeking out a rationale for actions based on physical causation. The second is a *ritual stance* – seeking out a rationale for actions based on cultural convention. The key distinction between the instrumental and the ritual stances is not merely the presence of causal opacity (i.e., a physical causal rationale for the action is unavailable) but is based on the interpretation of the opacity. In the instrumental stance, the physical causal basis of an action is in principle knowable, even if it is currently unknown (as would be the case for novice learners). In contrast, in the ritual stance, the rationale is not in principle knowable from the perspective of physical causality (Legare & Herrmann, 2013; Legare & Souza, 2012; 2013).

What distinguishes instrumental from ritual (i.e., conventional) practices often cannot be determined directly from the action alone (Humphrey & Laidlaw, 1994; Staal, 1990; Whitehouse, 2004) but requires interpretation by the learner based on relevant social cues and contextual information. For instance, the act of lighting a candle could be interpreted instrumentally (e.g., to find a lost object in the dark) or ritualistically (e.g., to commemorate an event or mourn a death). Where ambiguity in interpretation exists, learners may seek out cues to inform which psychological stance to adopt. We propose that instrumental and ritual interpretations are best understood as overlapping continua; in practice, the difference in perspective is often a matter of relative degree rather than kind.

Prior research has focused almost exclusively on children's imitation of a single model performing an action sequence (Carpenter et al., 2005; Lyons, Young, & Keil, 2007; Nielsen & Tomaselli, 2010; Schwier, Van Maanen, Carpenter, & Tomasello, 2006; Williamson & Markman, 2006). Yet children's social learning is sensitive to relations among individuals (Chudek, Heller, Birch, & Henrich, 2012; Chudek & Henrich, 2011; Nielsen & Blank, 2011) and particularly to whether two or more individuals act or judge in the same way (Corriveau, Fusaro, & Harris, 2009; Corriveau & Harris, 2010; Haun, Rekers, & Tomasello, 2012). Children conform to a group consensus in situations where no instrumental knowledge can be gained (Claidière

& Whiten, 2012) and disguise their correct opinions to conform to a group consensus (Haun & Tomasello, 2011).

In this study, we connect recent research on children's sensitivity to individuals who act in the same way to the large literature on imitation of a single actor. We presented all children with the same action sequence but sought to manipulate their stance in two distinct but related ways. First, we varied the verbal frame preceding a demonstration. The outcome-oriented frame was designed to trigger the instrumental stance whereas the convention-oriented frame was designed to trigger the ritual stance. Second, we varied the number of models that children saw (a single model vs. two models) and, in the case of two models, whether they acted in succession or synchronously. More specifically, children viewed one of the following four types of modeling: (i) *Single/Twice*: one single model demonstrating the action twice (for a total of two demonstrations); (ii) *Successive/Once*: two successive models each demonstrating the action once (for a total of two demonstrations); (iii) *Synchronous/Twice*: two synchronous models each demonstrating the action twice (for a total of four demonstrations); and (iv) *Synchronous/Once*: two synchronous models each demonstrating the action once (for a total of two demonstrations). For a more schematic representation of the types of modeling, see Fig. 2. Note that two synchronous conditions were included – Conditions (iii) and (iv) – in order to check whether synchrony or the total number of demonstrations affected imitative fidelity.

Each participant was presented with one of the eight possible combinations of frame and type of modeling. In order to investigate the possibility that children become increasingly sensitive to conventional information as they age (Yu & Kushnir, 2013), we conducted the study with children ranging from 3- to 6-years-old.

We predicted that children would engage in more faithful imitation of the demonstration when it was preceded by a convention-oriented verbal frame rather than an outcome-oriented one. We anticipated that the type of modeling would have a parallel effect. We predicted that children would engage in the most faithful imitation after watching two synchronous actors (Conditions iii and iv) and the least faithful imitation after watching a single actor (Condition i). This latter prediction was based on the assumption that seeing two people do the same thing at the same time is a strong indication that the specific form of the activity – the exact way in which it is performed – is regulated by convention.

Our interest in synchrony was motivated by evidence that many rituals involve synchronous actions (e.g., kneeling or clapping in unison) (Ehrenreich, 2007; Freeman, 2000; McNeill, 1995), and by research illustrating greater intragroup cooperation among people who participated in synchronous activity (Wiltermuth & Heath, 2009). Given that rituals and synchrony serve to bind groups together (Durkheim, 1915; Hove & Risen, 2009; Reddish, Bulbulia, & Fischer, 2013; Whitehouse, in press), if children show greater imitative fidelity after witnessing two synchronous actors than after two non-synchronous actors, this would suggest a conventional motivation for their imitation.

To further understand the impact of verbal framing and type of modeling on imitative behavior, we also asked

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