Evolution and Human Behavior 36 (2015) 191–198

Contents lists available at ScienceDirect

Evolution and Human Behavior

journal homepage: www.ehbonline.org

Original Article

The perpetuation of ritualistic actions as revealed by young children's transmission of normative behavior

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ARTICLE INFO

Article history:
Initial receipt 27 June 2014
Final revision received 6 November 2014

Keywords:
Social learning
Overimitation
Cultural transmission
Ritual
Normative behavior

ABSTRACT

Children will comprehensively copy others' actions despite manifest perceptual cues to their causal ineffectiveness. In experiment 1 we demonstrate that children will overimitate in this way even when the arbitrary actions copied are used as part of a process to achieve an outcome for someone else. We subsequently show in experiment 2 that children will omit arbitrary actions, but only if the actions are to achieve a clear, functional goal for a naïve adult. These findings highlight how readily children adopt what appear to be conventional behaviors, even when faced with a clear demonstration of their negligible functional value. We show how a child's strong, early-emerging propensity for overimitation reveals a sensitivity for ritualistic behavior.

1. Introduction

Activities basic to our survival, such as eating, drinking, and courtship, vary remarkably from country to country, sometimes even from region to region. Such diversity arises from our drive to act in accordance with our social in-group. We are motivated to be like others and to act as others do so that they will like us (Lakin, Chartrand, & Arkin, 2008). Acting in accordance with our in-group enhances health and well-being while avoiding scorn and isolation (Jetten, Haslam, Haslam, & Dingle, 2014). For example, eating in the same fashion as our group members may be as important as the act of eating itself. Herein lies a paradox: What if the pursuits of those around us comprise redundant processes that, at least for efficiency's sake, we should ignore? Would we only focus on those actions having clear functional valence? Recent research suggests that we would not.

From early in life we are prone to copy others' use of objects so inclusively that we incorporate visibly, causally irrelevant actions (Horner & Whiten, 2005; Lyons, Young, & Keil, 2007; Nielsen, 2006). This tendency to 'overimitate' increases with age (Marsh, Ropar, & Hamilton, 2014; McGuigan, Whiten, Flynn, & Horner, 2007) and is prevalent in starkly contrasting cultural groups (Nielsen, Mushin, Tomaselli, & Whiten, 2014; Nielsen & Tomaselli, 2010). According to Lyons and colleagues (Lyons, Damrosch, Lin, Macris, & Keil, 2011; Lyons et al., 2007) children show this puzzling behavior because they are yet to develop a mature understanding of the connection between actions and their outcomes and hence interpret any demonstrated action as causally necessary. Contrasting with this perspective are accounts that see overimitation as something socially driven that children engage in despite being fully aware of the redundancy of any irrelevant actions employed. Proponents of the affiliation view (Nielsen, 2008; Nielsen, Moore, & Mohamedally, 2012; Nielsen, Simcock, & Jenkins, 2008; Over & Carpenter, 2012, 2013) suggest overimitation arises from a human-specific tendency to copy as a way of showing others they are like them and in turn to be liked by them, whereas normativity accounts couch the replication of redundant actions as being viewed as part of a broader action sequence that, although causally irrelevant, are nevertheless an essential and obligatory part of the activity (Kenward, 2012; Kenward, Karlsson, & Persson, 2011; Keupp, Behne, & Rakoczy, 2013). Regardless of their veracity, each of these perspectives overlooks a fundamental aspect of human behavior.

As our ancestors emerged from the Middle Paleolithic, social group size began to increase from those typical of non-human apes and towards numbers commensurate with modern humans (Dunbar, 2003). With increasing group size came the possibility of cumulative culture (Muthukrishna, Shulman, Vasilescu, & Henrich, 2014), generating the ever more sophisticated repertoires that have contributed crucially to our species' remarkable success (Tomasello, 1999; Whiten, 2005). With population size increased, new necessities and problems arose, including issues related to co-operation, allocation of resources, and social living. The pressure to distinguish devoted in-group members from imposters or interlopers became increasingly important, as did the need to gain social acceptance, and avoid ostracism, from majority group members.

Actions we execute deliberately, meticulously and intentionally, can be highly informative. These actions, when costly (in terms of time,

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http://dx.doi.org/10.1016/j.evolhumbehav.2014.11.002
1090-5138/

energy or physical endurance) reliably indicate commitment to in-group beliefs (Atran & Henrich, 2010; Henrich, 2009; Soler, 2012). When we willingly undergoing a costly initiation rite, like scarification, we lend greater credibility to our claim as a loyal tribe member than vocal exhortations of the same (Sosis, Kress, & Boster, 2007). In our evolutionary past those relying on verbal instruction to learn the attitudes and behaviors leading to social approval would have likely been at far greater risk of manipulation, and hence of fitness disadvantage, than those who could critically evaluate words relative to actions (Henrich, 2009; Rossano, 2012). Ritualistic actions have thus played a critical role in the development of human society.

According to Rossano (2012) a number of behavioral steps are necessary for actions to become ritualized. Critical elements of a larger set of behaviors are isolated and become more restricted and stylized in their execution. Ritualized actions must also be executed in a prescribed manner, repeated to attract and hold attention, and the goals demoted such that the acts performed are ends unto themselves and are not necessarily associated with an instrumental outcome. Rossano explicitly states that these are also the features that define overimitation. Exhibiting overimitation can thus be seen in the context of children's adaptive inclination to adopt ritualized actions, to do something because "this is how it is done here".

To appear intentional, overimitation actions are typically communicated to children in a clear, deliberate manner. According to the theory of human pedagogy (Csibra & Gergely, 2009) children have a natural predisposition to learn actions modeled in this way, assuming relevant cultural information is being taught. Overimitation might therefore arise because children are responding to the cues of a person who they assume is teaching them something important, kind-relevant and generalizable (Hoehl, Zettersten, Schleihauf, Gratz, & Pauen, 2014). If children interpret the redundant actions employed in overimitation tasks as ritualized behavior, indicating something akin to "this is how we do it here", causally redundant actions should still be reproduced when pedagogical demand characteristics are diluted. Experiment 1 tested this.

Children first joined an experimenter (E1) who played with one of her 'favorite' toys. E1 subsequently placed the toy in a box and left the test environment. A second experimenter (E2) entered, took the toy from the box, played with it then placed it in a new box, subsequently demonstrating how the box could be opened using causally irrelevant actions in the process. E1 then returned, looked in the original box, and exclaimed that she did not know where her toy had gone. The key here is how children chose to open the new box given: (a) it is 'for' a naïve adult rather than a demonstrator who is no longer present; and (b) E1's request shifts the focus of the task towards the outcome and away from the actions. We compared children's responses to a standard overimitation situation and a social pressure condition where E2 remained in the test room when E1 returned to find her toy had been removed from the original box.

If children interpret E2's actions in a ritualistic manner and exhibit them to signal alignment with the experimenters as new social partners they should imitate the irrelevant actions when opening the box for E1, regardless of condition. Conversely, if they are primarily motivated to demonstrate to E2 that they have learned what has been taught to them, the irrelevant actions should be exhibited at the lowest rates when E2 is absent and the ostensible aim is to help E1. In contrast, the causally relevant actions should be replicated at equal rates across conditions as there is little reason to omit them given they are associated with bringing about the target outcome.

2. Experiment 1

2.1. Method

2.1.1. Participants

In total, 49 children participated in this experiment. Four were excluded due to experimenter error, one for inattentiveness, and two for refusing to participate. A final sample of 42 children remained (26 males and 16 females) of four years of age (M = 54 months, range = 48–59 months). We chose this age group as it spans a period when overimitation has become an established part of young children's behavioral repertoire. Studies of imitation in young children commonly employ cell sizes of 12–15 children per condition (Flynn & Whiten, 2008; Nielsen & Blank, 2011). It was thus decided to cease data collection once 14 children had been tested in each condition. Participants were recruited from an existing pool of parents who had previously expressed interest in having their child take part in developmental research. Parents were contacted via a letter in the mail and by phone, and those interested in volunteering brought their children to the university for testing. The majority of the children participating were Caucasian and from middle-class socioeconomic backgrounds. Children were randomly assigned into one of three experimental conditions. All children were presented with a small gift and certificate of participation.

2.1.2. Apparatus and test environment

Testing was carried out in a dedicated child-friendly test room of a university-based child development research facility. The test room consisted of a play mat, a chair, a cushion for the child to sit on, a small couch for parents to sit on, and a black wooden screen to conceal the apparatuses before use. Sessions were videotaped using a camera mounted on a tripod positioned in the corner of the room.

2.1.2.1. Boxes. Four distinct boxes (see Table 1), each having a different color, design and opening mechanism were used throughout testing. Two were designated as initial location boxes (blue box and purple box), and children did not act on these at any time during the experiment; rather they were used as props for the task narrative. The blue box (15 cm × 22 cm × 15 cm) was wooden, and its hinged lid opened downwards like a trap door. Pulling a small knob fixed to the lid opened it. The purple box (21 cm × 15 cm × 10 cm) had a rectangular base and a rounded lid, and could be opened by unlatching a metal clasp attached to the front and pushing the lid up.

The changed location boxes were acted on by the children. The green switch box (19 cm × 12 cm × 6 cm) was mounted on a wooden base (19 cm × 36 cm). Sliding a teddy bear-shaped knob located on the front of the box horizontally from left to right released a hidden, spring-loaded mechanism thereby opening the lid. The wooden box (30 cm × 19 cm × 10 cm) was mounted on two wooden supports, and pushing the lid up via two small metal loops fixed to the front could open its hinged lid. The order of presentation of the boxes was counterbalanced across trials.

2.1.2.2. Tools. The changed location boxes were presented along with the following tools: 1) a 16 cm yellow drumstick with rubber end; 2) a 19 cm green wooden mallet; 3) a 20 cm orange-colored dowel; and 4) a 35 cm red-colored rectangular stick. The drumstick and wooden mallet were always presented with the wooden box, and the orange stick and red stick were always presented with the green switch box. One tool from each pair was placed to the immediate left of the box, and the other was placed to the immediate right, counterbalanced across boxes, conditions, and participants.

2.1.2.3. Sequence of actions. Each of the two changed location boxes had a unique opening demonstration associated with it. Certain actions were termed '*arbitrary*', because they served no causal function in terms of opening the box. Other actions were termed '*causally-related*', because the action itself was functionally connected to opening the box even though it was not the most efficient way to do so (that is, for each action, the outcome could be more efficiently achieved by hand). Opening demonstrations incorporated both arbitrary and causally-related actions, and involved the use of the tools associated with each box.