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The influence of goal demotion on children's reproduction of ritual behavior

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ABSTRACT

Rituals are a ubiquitous feature of human behavior, yet we know little about the cognitive mechanisms that enable children to recognize them and respond accordingly. In this study, 3 to 6 year old children living in Bushman communities in South Africa were shown a sequence of causally irrelevant actions that differed in the extent to which goal demotion was a feature. The children consistently replicated the causally irrelevant actions but when such actions were also fully goal demoted they were reproduced at significantly higher rates. These findings highlight how causal opacity and goal demotion work in tandem to demarcate actions as being ritualistic, and specifically, how goal demotion uniquely influences the reproduction of ritualistic actions.

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1. Introduction

Rituals bind individuals into groups, and are thought to have played a crucial role in the emergence of complex societies (Norenzayan et al., 2016; Whitehouse & Lanman, 2014). Until recently, the study of rituals has primarily been conducted by anthropologists using qualitative methodologies. This has made it difficult for those in the quantitative fields to establish robust generalizations about the causes and effects of ritual on social cognition and behavior (Rappaport, 1999; Rossano, 2012). The absence of such foundational knowledge represents a problem for understanding how rituals are acquired and understood throughout human development. If rituals play a role in the formation of groups and more complex societies, we must understand how (and when) children contribute to (or are influenced by) this process. Two candidate features of ritual that allow us to discern actions as non-ordinary are causal opacity and goal demotion. The aim of the current research was to investigate how these features of ritual influence young children's learning proclivities.

Rituals comprise conventional actions that feature repetition, redundancy, formality, and stereotypy, in which production of the process is prioritized over the achievement of the outcome (Legare & Souza, 2014; Sørensen, 2007). Causal opacity and goal demotion are a consequence of these features (Kapitány & Nielsen, 2015, 2017). Causal opacity is generated when actions are uninterpretable from the perspective

of physical causality as the actions lack an intuitive or observable connecting relation between the specific action performed (e.g., synchronized dancing) and the desired outcome or effect (e.g., making it rain) (Legare & Souza, 2012, 2014; Sørensen, 2007; Whitehouse, 2012). Goal demotion refers to an observer's ability to infer and understand an actor's reason (e.g., goals or motivations) for producing a given action sequence (Boyer & Liénard, 2006; Kapitány & Nielsen, 2015, 2017; Schjoedt et al., 2013). The key distinction between causally irrelevant and goal demoted actions is that, in the former, it is unclear what an actor's actions achieve, whereas in the latter it is unclear why the actor is motivated to perform them. Take someone twirling a cloth around in a circular motion in the air several times, with no causally identifiable outcome resulting from the action, this would constitute a causally opaque action ("what effect does that action have?"). If they use the cloth to then scrub an apparently already clean table this would constitute a goal demoted action; The causality of the action is transparent (i.e., to clean the table) but the intention driving it is not (i.e., why is the actor doing it?). Notably, rituals tend to be both opaque and goal demoted, and as a result are rarely dissociated both practically, and in the literature.

When actions are ritualistic, the inability to attribute causal- and intentional-understanding increases until it is clear to the observer that such actions are being performed for reasons other than to satisfy an instrumental outcome. Prior research has found that adults treat objects subjected to such actions differently from objects subjected to ordinary action (Kapitány & Nielsen, 2015, 2017; Vohs, Wang, Gino, & Norton, 2013). However, no published study has directly or empirically explored how children interpret and respond to causally irrelevant and goal demoted actions.

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There are multiple ways in which children show social and cognitive preparedness to adopt the ritualized behaviors of those around them (see Legare & Nielsen, 2015). According to a number of authors (Rossano, 2012; Wilks, Kapitány, & Nielsen, 2016) the most compelling example is “overimitation”, whereby children reliably copy visibly causally irrelevant actions modelled to them by an adult (Horner & Whiten, 2005; Nielsen, 2006) – notably these actions are typically causally opaque. For example, Nielsen and Tomaselli (2010) had an experimenter show children (aged 2 to 13 years) how to retrieve a toy from a closed box (e.g., by pushing open a trap door). Although the box could easily be opened by hand, the adult complicated the demonstration by swiping a miscellaneous object across the top of the box in a causally irrelevant manner, then using the same object to open the box. Children replicated the model's object use and incorporated the causally irrelevant actions into their response, and did so regardless of whether they lived in a large, industrialized Western city or in Bushman communities of the Kalahari Desert.

Extending this design, Nielsen, Kapitány, and Elkins (2015) presented preschool children with actions that included opening a box and retrieving an object. In one condition, before the box was opened and the object retrieved, the sequence incorporated a redundant action (e.g., tapping the top of the box with a tool). In a contrasting condition, the redundant action was modelled *after* the object was retrieved from the box. Both conditions feature a causally irrelevant action, but only the latter possibly features goal demotion (as it is unclear why the experimenter would perform deliberate actions after the afforded goal had been satisfied). Children reproduced the redundant actions at statistically similar rates across conditions. Whether the redundant action occurred before or after the goal of the sequence had been achieved, its reproduction was neither diminished nor increased. Actions in which goal demotion is emphasized thus appear to arouse similar levels of reproduction as actions in which it is not emphasized. However, the overall sequence was still associated with a goal, even if some redundant actions occurred after the goal had been satisfied. Does goal demotion cue conventional responses and arouse high fidelity reproduction if an action sequence is simply devoid of any afforded goal? And given the importance of contiguity in learning (Kushnir & Gopnik, 2007) is goal demotion a continuous dimension, such that as the contiguity of action and outcome declines, goal demotion increases?

To investigate this we presented children aged 3 to 6 years with versions of the task employed by Nielsen et al. (2015). Children were randomly assigned to one of four conditions. In a control ‘Goal Apparent’ condition, an adult modelled a sequence comprising a causally irrelevant action, a causally relevant action, and a second causally irrelevant action *before* retrieving a prize from inside a box. Here, the sequence features causally irrelevant actions, but as the action ultimately leads toward the satisfaction of a goal – a sticker is retrieved from inside a box – all actions may be interpreted as having been motivated in the service of that goal, and hence are Goal Apparent. This was contrasted with three experimental conditions in which the degree of goal demotion associated with the actions was altered. In a Goal Available Condition the second causally irrelevant action was performed after the goal was realized. As the sticker had already been retrieved it is unclear why the second causally irrelevant action was performed, but it was nonetheless associated and contiguous with the goal (as it was performed as part of the larger action sequence that included a goal). In a Goal Unclear Condition all actions were performed as part of a sequence, but once the box was opened the sticker was not retrieved. The apparent goal of the sequence (retrieving the sticker) was never realized, and the actions and the afforded outcome are not contiguous. Finally, in a No Goal Condition the sequence was modelled but there was no reward in the box. This last condition features complete goal demotion – there is no affordance or satisfaction of a causal sequence of events that brings about, or is justified by, an outcome: Nor is any degree of contiguity possible. We thus anticipated that children in this condition would replicate

the irrelevant actions at the highest rate. Because of the exploratory nature of this work we made no other direct predictions.

Further, it has recently been argued that the dearth of systematic research outside Western cultural contexts presents a major impediment to theoretical progress in the developmental sciences (Legare & Harris, 2016; Nielsen & Haun, 2016). For this reason we deliberately conducted our research with children from Bushman communities in Southern Africa; a decision representing a meaningful departure from the otherwise limited and homogenous status quo (Nielsen, Haun, Kärtner, & Legare, 2017).

2. Method

2.1. Participants

All children in the target age-range at the communities we visited were invited to participate. Our aim was to test as many as were available and willing. Overall cell sizes were thus small, but these are nonetheless in line with previous studies conducted with these populations (Nielsen, Mushin, Tomaselli, & Whiten, 2014; Nielsen, Tomaselli, Mushin, & Whiten, 2014) and with comparable cross-cultural social learning research (e.g., Berl & Hewlett, 2015). Sixty-five Bushman children (33 male; 32 female) thus participated in this experiment, but 10 were excluded for a variety of reasons (3 for experimenter error; 1 for not engaging with the apparatus; 4 because of interference either from other children or a carer; and 2 because of uncertainty surrounding their age). Those included in the final sample were aged between 3 and 6 years (median age = 5 years, mode = 5 years). Of the final 55 children (27 male, 28 female), 31 were living in Platfontein, an immigrant settlement in a rural area 15 km west of Kimberley, the provincial capital of South Africa's Northern Cape. All children were members of either the !Xun or Khwe clans (for more detail see den Hertog, 2013; Nielsen, Mushin, et al., 2014). An additional 24 children were included from 3 different ǀKhomani settlements in the region of the Kgalagadi Transfrontier Park, 600kms north-west of Platfontein. These settlements sit on land awarded to the ǀKhomani San community as an outcome of a restitution claim settled in 1999 (Grant, 2011). Prior to this claim the violence and dislocation wrought by colonialism and apartheid resulted in the dispersion of the ǀKhomani, their language, and their cultural practices (Tomaselli, 2005). Though advances have been made and are being made, the children on these settlements, as with those from Platfontein, live in sub-economic conditions.

Though hunting and gathering occasionally and sporadically take place in these communities, commodities are primarily acquired through commercial and private trade (even though these groups are economically disadvantaged compared to those living in cities and more established communities). Our participants and their families are exposed to modern society and sit both inside and outside of it, balancing contemporary and traditional values and ways of life, while dealing with the social and economic disadvantages that are a common experience of the world's indigenous peoples (Tomaselli, 2005). These children and the environments in which they develop thus contrast starkly with those who typically participate in child development research (Nielsen et al., 2017). All children were randomly allocated to one of four experimental conditions described below and received a small gift for participating (i.e., an item of clothing or small toy). The second author has been working in these communities for over 15 years and is well known to those living there. He was present for all testing. The first author conducted the testing which commenced after children had spent several minutes playing warm-up games unrelated to the experiment.

2.2. Apparatus

Children were presented with two distinct puzzle boxes: A *Light Blue* box (13 cm × 17 cm × 13 cm) that could be opened by lifting a metal

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