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When instrumental inference hides behind seemingly arbitrary conventions

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Abstract

We review recent evidence that game rules, rules of etiquette, and supernatural beliefs, that the authors see as "ritualistic" conventions, are in fact shaped by instrumental inference. In line with such examples, we contend that cultural practices that may appear, from the outside, to be devoid of instrumental utility, could in fact be selectively acquired and preserved because of their perceived utility.

The authors propose a plausible case for the idea that detail-focused copying fulfills an affiliative function, and underlies the cultural evolution of apparently arbitrary conventions. In their own terms, the actions behind "social etiquette, clothing fashions, tea ceremonies, and even the rules of childhood games" are "simply copied without question" because "their purposes remain mysterious" (target article, sect. 2, para. 6). While we do not deny this possibility, we suspect that the cultural evolution of many seemingly arbitrary conventions may be, despite appearances, mostly driven by instrumental inference at the cognitive level. We argue that many conventions which, from the outside, may appear devoid of instrumental utility, and "slavishly" learned simply because it's the "done" way to behave, are in fact selectively acquired and preserved, by the people involved, because of perceived instrumental benefits (see also André, Baumard, & Boyer, 2020; Singh, 2020). While demonstrating this on each instance of apparently arbitrary convention would require a whole research program, we here illustrate this point on the following examples – game rules, social etiquette, and religious rituals.

1. Sport and game rules

Sport and game rules are widely deemed typical examples of arbitrary conventions (Schmidt & Tomasello, 2012). The authors similarly argue that competitive sports (e.g., football), despite being oriented toward some instrumental outcomes (e.g., playing a ball into the opposing teams' net), are constrained by slavishly copied, causally opaque conventions (e.g., the prohibition to use one's hands to do so). We argue, however, that people adopt an instrumental stance toward *these conventional rules themselves*, designing and selectively retaining them to satisfy the goals they pursue by playing or watching sports and games – such as being entertained and signaling one's skills (Lombardo, 2012; see Dubourg & Baumard [2022] for another example of entertainment technology).

This is manifested by the fact that sport and game rules are transformed, under people's impulse, in a direction that increasingly satisfies those goals. Sport federations have adapted their rules throughout history to maximize players' and spectators' enjoyment, and the possibility for players' to signal their physical skills. The "offside rule," for instance, has been explicitly designed and retained because it prevents players from "goal-hanging," thereby making the game harder to play and funnier to watch (Zhao, 2021; see Fig. 1 for other examples). Even at a more micro-level, non-professionals who play street football spontaneously adapt the official rules of football to the context (e.g., the pitch dimensions). For instance, they commonly remove goalkeepers and reduce the number of players, to make the game funnier and more physically challenging (Hill-Haas, Dawson, Impellizzeri, & Coutts, 2011). In other words, we doubt that people would slavishly copy rules that would make a sport boring and hard to use to signal

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Date	Modified rules	Effects
1993	Give a warning through yellow card to players who deliberately delay the game, meanwhile the opponent carries out indirect free kick in the place of foul.	Make the match fluent and ornamental.
1998	The referee will show the red card to directly severely penalize those who maliciously foul with vile nature.	Guarantee the safety of players and encourage them to break through and attack.
1998	Standing on offside position doesn't foul. Players foul if they stand on offside position and obtain benefits.	Emphasize defense and encourage attack, promote the development of attack tactics.
2006	The referee may directly show the red card to penalize diving with vile nature.	Guarantee fairness of competition at the meantime make the competition fiercer.

Figure 1 (Dubourg et al.) Instrumental effects justifying rules modified by the international football federation (from You, 2017).

or train their physical skills. Taking back the authors' example, we propose that people who (copy people who) use their feet and not their hands, do it because it makes the game funnier and allows better display of gross motor skills.

2. Social etiquette

As the authors note, rules of etiquette also appear as purely arbitrary conventions, compliance to which is motivated solely by a "need to belong." Yet closer examination again suggests that their cultural design and preservation also obeys non-arbitrary, instrumental criteria. In a famous study, Nichols (2002) showed that, of the table manners promoted in etiquette manuals of the European Renaissance (see Elias, 1939), those that prohibited behaviors eliciting disgust (e.g., spitting) were more likely to have been culturally preserved to the point of being still part of contemporary social etiquette. Rules that didn't elicit disgust, by contrast, were more likely to go culturally extinct, presumably precisely because they appeared to people as more arbitrary (Nichols, 2002). If social etiquette was culturally preserved because of slavish, affiliative copying, etiquette rules should have been preserved whatever their content. Rather, what seems to have happened is that, despite their apparent arbitrariness, etiquette rules have stabilized because people perceive them (not necessarily consciously) as satisfying some intuitive goal, such as not imposing on others the unpleasant experience of being disgusted while eating (Baumard, 2016; Royzman, Leeman, & Baron, 2009).

3. Supernatural rituals

The authors also argue that magico-religious rituals, despite being oriented toward some instrumental goal (i.e., warding off misfortune), are socially learned through the ritual stance because of their "causal irresolvability." Yet a growing body of research suggests that the social learning of such cultural traits is mostly driven by instrumental inference. For example, Hong and Henrich (2021) present abundant historical and ethnographic evidence that people adopt (or not) divination practices primarily based on their evaluation of whether the latter "works" (or not) for revealing accurate information. People, moreover, "carefully discriminate among diviners according to perceived skill, ability, or success … in pretty much the same way as [they do for] any other artisans whose abilities can be evaluated by other community members" (Hong & Henrich, 2021, pp. 625–626). Hong, Slingerland, and Henrich (2022) similarly review historical evidence that, despite the apparent "exoticity" of rain-making rituals to modern people, early Chinese mostly adopted a "problem-solving," instrumental mindset toward rain-making methods, willingly abandoning – rather than slavishly copying – methods that seemed ineffective in making rain fall (see also Boyer, 2020; Fitouchi & Singh, 2022; Singh, 2021, 2018; for other examples).

4. Conclusion

To be clear, we do not deny that the ritual stance may, in the end, underlie the social learning and preservation of some arbitrary cultural practices. We also understand that, according to the authors, the ritual and the instrumental stances often coexist and alternate during social learning, in a "bifocal spectacle." Our point is simply the following: The fact that many conventions which initially appear as "ritually" acquired are in fact, on closer inspection, substantially shaped by instrumental inference, suggests that this may be the case for many other apparently arbitrary conventions – from weddings (see e.g., Boyer, 2018) to codes of conducts to initiation and puberty rites. If this is the case, the ritual stance should not be put on the same level of importance as the "instrumental stance" as a cognitive foundation of cultural evolution. As things stand, we doubt that the "ritual" part of human social learning is large enough, and causally powerful enough in driving cultural evolutionary dynamics, to justify a "*bi*-focal" theory of cultural evolution.

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Revisiting an extant framework: Concerns about culture and task generalization

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Abstract

The target article elaborates upon an extant theoretical framework, "Imitation and Innovation: The Dual Engines of Cultural Learning." We raise three major concerns: (1) There is limited discussion of cross-cultural universality and variation; (2) overgeneralization of overimitation and omission of other social learning types; and (3) selective imitation in infants and toddlers is not discussed.

The target article brings renewed attention to the complexity of cultural evolution and the many ways the instrumental and conventional/ritual stances complement each other. We look forward to the continued debate it will generate and encourage the authors to consider additional relevant literatures not covered in the current article.

It is well-documented that children will flexibly switch learning approaches based on the ebb and flow of changing social and instrumental motivations (Carpenter & Call, 2009; Over & Carpenter, 2012). Children's proclivity for doing so was highlighted in several overimitation studies (e.g., Herrmann, Legare, Harris, & Whitehouse, 2013; Legare, Wen, Herrmann, & Whitehouse, 2015) and then elaborated as the "Dual Engines of cultural learning" – an integrative account that outlines how the instrumental (innovation) and conventional/ritual (imitation) stances (Herrmann et al., 2013; Legare et al., 2015) can work in tandem to facilitate cumulative cultural evolution (Legare & Nielsen, 2015). The target article reiterates much of this theoretical framework, adding greater emphasis on rituals and cognition. We appreciate Jagiello et al.'s detailed explanation of relevant key concepts, but note omissions regarding cross-cultural generalizability issues, other types of social learning, and imitative flexibility in infancy and toddlerhood.

First, although some questions related to cultural factors are raised (target article, sect. 5), Jagiello et al. have not discussed extant theories and evidence of the ways cultural factors can influence the development of stance behavior. They mention that overimitation has been studied in a broad range of cultural groups (target article, sect. 3.1), but none of the cross-cultural study results are discussed. For example, imitative nuances between Ni-Vanuatu and US children in Clegg and Legare (2016) are neglected. Compared to US children, the instrumental stance of Ni-Vanuatu children involved higher fidelity, likely because of the population valuing conformity more than those from the United States (Clegg, Wen, & Legare, 2017). Similarly, within-population variation in Corriveau et al. (2017) is not mentioned. In that study, more Asian (but not Caucasian) American children opted for a conventional/ritual stance when social pressure was high. This risks perpetuation of a false assumption that high-fidelity imitation mechanisms across all populations are universal. Although children seem to generally display a propensity for high-fidelity imitation, its degree, underlying motivations, and contexts across different populations remain uncertain.

For example, overimitation studies conducted with hunter–gatherers in Africa reported mixed findings. Aka (Congo Basin) adults but not children displayed overimitation in a classic puzzlebox task (Berl & Hewlett, 2015). Hai||om children (Namibia) tended to overimitate only in tasks that involved tool-use (Stengelin, Hepach, & Haun, 2020). However, !Xun and Khwe children (Platfontein) replicated ritual-like actions with high fidelity (Nielsen, Tomaselli, & Kapitány, 2018). The underlying mechanisms and motivations for imitation among hunter–gatherer children should not be assumed to resemble those in other societies. They grow up in an egalitarian society, are given a high level of autonomy, and engage primarily in observational and peer-to-peer

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