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When handicraft experts face novelty: Effects of shape and wheel familiarity on individual and community standardization of ceramic vessels

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ABSTRACT

Indian Prajapati and Multani Kumhar potting communities use different wheels in throwing their vessels. Highly-experienced potters from these communities threw assemblages of (i) familiar shapes using their familiar wheels, (ii) unfamiliar shapes using their familiar wheels and (iii) unfamiliar shapes using unfamiliar wheels. We analyzed how the potters dealt with the novelty provided by the unfamiliar shapes and wheels by assessing their effects on the degree of assemblage standardization. When throwing familiar shapes with familiar wheels, potters demonstrated a high degree of standardization, both at the level of the individual potter and at the level of their respective communities. Throwing unfamiliar shapes considerably affected standardization, especially for the more difficult shapes. Hence, novelty may be detected in archaeological assemblages by the coexistence of (large quantities of) highly standardized artifacts of one type and (smaller quantities of) less standardized artifacts of another type. However, throwing the unfamiliar shapes on unfamiliar wheels ("borrowed" from the other community) did not give rise to additional markers of novelty in the assemblages produced. Thus, at least part of the expert potters' skill can be transferred from their usual conditions of practice to new, unfamiliar conditions without leaving observable traces in the artifacts produced.

Introduction

Expertise in motor skill can be considered as the "ultimate" stage of learning (Biryukova and Bril, 2008), attained only after many years of extensive practice (Grossman, 1959; Ericsson and Lehmann, 1996). At this stage, expert craftsmen almost flawlessly adapt their movements to the task constraints (Bernstein, 1967; Bril et al., 2010). Expert stone knappers, for example, precisely control the vector of the final velocity of the hammerhead, crucial in detaching a particular flake and, consequently, for the shape of the final product (Biryukova and Bril, 2008). Because it is this mastering of constraints that allows an expert craftsman to produce a high-quality artifact, expertise is surely visible at the level of the individual specimen produced but even more so in the ability to reliably reproduce the same artifact, that is, in the production of standardized assemblages of artifacts. By the same token, expertise in sport skills is undoubtedly characterized by an athlete's outstanding performance on a given occasion, but more broadly by her/his ability to achieve such high-level performance repeatedly (Bootsma and Van Wieringen, 1990; Sevrez et al., 2009, 2012). Indeed, Guthrie (1952) defined skill as consisting "in the ability to bring about some end result with maximum certainty and minimum outlay of energy, or of time and energy" (p. 136).

However, standardization of assemblages of artifacts may not only be observed at the level of the individual craftsman but also at the level of the community of practice (Lave, 1991). While expertise alone can account for the former, the latter depends on additional factors such as production organization (Costin and Hagstrum, 1995) and social conformism (Moscovici and Abric, 1984). Within a community of practice, the proximity between expert potters would, over time, lead them to throw vessels that fit into single shapes (i.e., standardized assemblages). In this sense, these shapes represent *emblemic markers* of the community of practice (Eerkens and Bettinger, 2008).

Moreover, expert craftsmen typically belong to a lineage within a handicraft tradition. Because they acquired their skill during apprenticeship(s) in the presence of mentor(s), who themselves were at some point apprentices of other mentors, their skill has been shaped by the cultural transmission that occurs over generations (Ingold, 2001). Ethnoarchaeological studies have extensively described different handicraft traditions, as the Indian

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stone knapping tradition in Khambhat (e.g., Kenoyer et al., 1991; Roux and Bril, 2005; Roux, 2000) or the Kalinga pottery tradition in Philippines (e.g., Longacre et al., 1988; Longacre, 1991; Stark et al., 2000; Stark, 1991). A given handicraft tradition is distinguishable by specific techniques of production (often associated with specific tools) and by specific artifact shapes. These techniques and shapes are thus familiar to the craftsmen belonging to this tradition. Importantly, over time this familiar context of production is susceptible to change. Indeed, craft traditions are not frozen cultural entities but rather sociotechnical aggregates that evolve, following the socio-economic changes of societies (Gosselain, 2000). Changes in shape or technique can occur through innovation within a community or can arise from borrowing between communities. For example, in northern India the modification of the traditional Prajapati (Hindu) "jajmani" barter system has led Multani Kumhar (Muslim) potters to adopt some of the Prajapati traditional shapes (Roux, 2013). Because it allowed a faster production of water storage jars, Haalpulaar'en women potters in Senegal have been reported to have borrowed the more efficient coiling technique of the Soninke women potters (Gelbert, 2002).

In the present contribution we evaluate how craftsmen that are experts in the production of familiar shapes using familiar tools adapt to the production of new, unfamiliar shapes and to the use of new, unfamiliar tools. To this end, we conducted field experiments in the Uttar Pradesh region of northern India, including both the Prajapati and Multani Kumhar potting communities. We analyzed the production of adult expert potters from both communities when throwing vessels of familiar vs. unfamiliar shapes, using familiar vs. unfamiliar wheels. This experimental approach to expertise in the face of novelty opens the road to a principled appreciation of innovation within archaeological analyses. Novelty in pottery – and how it may be detected in archaeological assemblages – has been addressed in earlier research but such studies have generally focused on novices, that is, most often children or adolescents who first learn a task (Creese, 2012; Crown, 2001, 2007; Wallaert-Pêtre, 2001). However, learning is not restricted to novices nor to a particular age, but is a process that operates over the whole life-span. Innovation by expert craftsmen was addressed by Arnold (2012) in a study of a particular type of shell bead within a large archaeological assemblage. In this approach the characteristics of beads rejected or abandoned before completion were used to distinguish the errors of novices from the mistakes of skilled craftsmen experimenting with new bead forms. In the present contribution we assessed the consistency of the assemblages produced by expert Prajapati and Multani Kumhar potters, at the level of the individual potter and at the level of the two communities of potters. Rather than focusing on particular functional or geometrical characteristics of the vessels thrown, we evaluated the variability of the assemblages produced. In so doing, we asked whether novelty affected the standardization of the different types of vessel thrown, a product characteristic widely used and debated in the (ethno)archaeological literature for its relation with production organization (e.g., Longacre et al., 1988; Arnold, 1991, 2000; Costin and Hagstrum, 1995; Roux, 2003; Arthur, 2014).

Materials and methods

Experimental setting

Eight Indian expert potters participated in the study: four Prajapati potters (group Pr) and four Multani Kumhar potters (group MK). The four Prajapati potters are referred to as Pr1 to Pr4; the four Multani potters are referred to as MK1 to MK4. These two groups of potters belong respectively to Hindu and Muslim communities living in the region of Uttar Pradesh, often in the same villages. The participants were all over 25 years of age and had a minimum of ten years of wheel-throwing experience (Mean ± SD, Pr: 24.3 ± 14.5 yrs and MK: 18.3 ± 7.3 yrs). In northern India the pottery handicraft is a traditional activity: the skill is learnt within endogamous castes that produce standardized traditional objects in mass production (Kramer, 1997; Roux and Corbetta, 1989; Saraswati and Behura, 1964). Over the last few decades, the trading networks of the two communities have become undifferentiated and, as a consequence, the respective productions of the two communities tend to be the same kinds of object (Roux, 2013). Although the repertories of the shapes produced are broadly shared by the two groups, the wheels used are community-specific and a non-borrowing phenomenon has been reported (Roux, 2013). The Pr potters use a hand-operated, high-inertia stick-wheel (Fig. 1, top panel), while the MK potters use a foot-operated, low-inertia kick-wheel (Fig. 1, bottom panel). The same soft gray clay is used by the two communities.

Fig. 1. The two common wheels used in northern India. Top panel: the high inertia stick-wheel used by the Prajapati potters. Bottom panel: the low-inertia kick-wheel used by the Multani potters. Drawings are adapted from Orton et al. (1993). The two wheels evoke distinct body positions: for the stick-wheel potters typically squat (sometimes they use a low stool), while for the kick-wheel potters sit.

A standardized experiment was set up in two pottery workshops – one Prajapati and one Multani – in the same village of Jahanjirabad. Potters were initially asked to produce two different assemblages. The first assemblage (denoted Experiment 1) included five familiar shapes, referred to as Money-Bank (A), Handiya (B), Kullar (C), Handi (D), and Kulfi (E), respectively (see Table 1). These familiar shapes were produced in the usual conditions of practice, using self-chosen quantities of clay. The four Prajapati potters (Pr1, Pr2, Pr3, and Pr4) produced shapes A, B, and C, while three Multani potters (MK1, MK2, and MK4) produced shapes A, D, and E. Each potter produced five specimens of the same shape. In this first experiment, potters relied on their practical experience of the shape to be produced; no visual model was presented.

The second assemblage (denoted Experiment 2) involved four unfamiliar shapes, referred to as cylinder (C1), bowl (C2), sphere (C3), and vase (C4), respectively. These unfamiliar shapes were produced using two predetermined[1] quantities of clay, 0.75 kg (A)

[1] The use of predetermined quantities of clay allows comparisons with the results of our earlier study on expert French potters who demonstrated mechanical optimization when reproducing the same model shapes with the same quantities of clay (Gandon et al., 2011). Using two different quantities of clay ensured that for each model shape potters threw vessels of different size.