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LIFE HISTORIES OF POTS AND POTTERS: SITUATING THE INDIVIDUAL IN ARCHAEOLOGY

Patricia L. Crown

Archaeologists often implicitly assume that individual ceramic objects were the work of a single individual artisan. Ethnographic and archaeological data suggest that this assumption should be questioned. Ceramics from the Greater American Southwest demonstrate that multiple hands contribute to the finished products in two ways. Two artisans may collaborate on vessels in various combinations of task differentiation. Alternatively, some vessels are modified over time, with artisans adding new features to existing vessels in diachronic collaboration. Such collaborative vessels have implications for understanding labor demands, learning and teaching frameworks, specialized production, and the life histories of ceramics.

Los arqueólogos suelen asumir que cada objeto de cerámica habría sido obra de un sólo artesano. Sin embargo, las evidencias etnográficas e incluso arqueológicas sugieren que esta suposición debería ser cuestionada. Cerámicas del Gran Suroeste Americano demuestran que múltiples manos han contribuido en la elaboración de los productos finales de dos maneras: dos artesanos pueden colaborar en la confección de las vasijas a través de diversas combinaciones en la especialización de las tareas. De manera alternativa, algunas vasijas existentes se modifican con el tiempo, con la posibilidad de que nuevos artesanos van añadiendo nuevos elementos en una especie de "colaboración" diacrónica. Tales vasijas "colaborativas" tienen implicaciones para la comprensión de las demandas del trabajo, los sistemas de aprendizaje y de enseñanza, la producción especializada, y las historias de vida de las cerámicas.

In 1977, the publication of *The Individual in Prehistory* (Hill and Gunn 1977) raised issues concerning the importance of individual variation in crafts production and provided initial methods for identifying the work of the individual artisan in an assemblage. Coming at a heady time when archaeologists optimistically sought to address anthropological questions of increasing specificity, the articles in *The Individual in Prehistory* pointed toward new directions for understanding variability in artifact assemblages and stimulated additional studies of the individual. Over time though, as archaeology has focused on different questions, some of the specific issues and methods raised have been supplanted and some have been incorporated into archaeology in unanticipated ways. In this paper, I question the underlying assumption in many of those papers: that individual artifacts were made by individual artisans. I argue instead that multiple hands often participate in the creation of finished ceramic vessels. Furthermore, as children learn to become competent potters, their motor performance and cognitive abilities alter with increased practice, making it nearly impossible to identify their entire corpus of work as the work of an individual. Finally, artisans may alter pots over time, covering the work of the original potter with later additions. While questioning some assumptions underlying *The Individual in Prehistory*, I freely admit that my own research assumes that we can tell when we do not have a single individual creating an artifact.

Situating the Individual in a Community of Producers

Multiple Hands and Task Segmentation

Ethnographic research emphasizes that, from gathering clay to firing a vessel, multiple hands may participate in the creation of finished pots. There are many steps involved in making a vessel, including some or all of the following: quarrying clay; gathering other materials for aplastics and pig-

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American Antiquity, 72(4), 2007, pp. 677–690

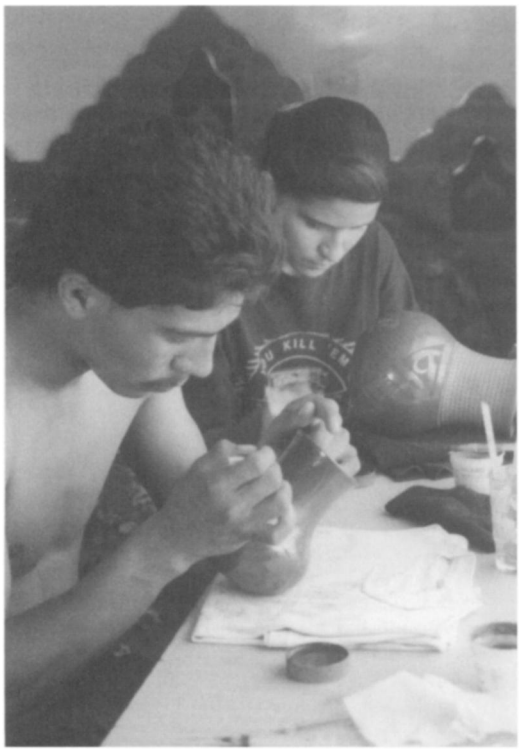

Figure 1. Potters from Mata Ortiz, Chihuahua, working cooperatively to complete designs on pottery for sale. Octavo Silviera, the potter on the left, works on the skilled, detailed portions of the designs, and his wife, Myrna, on the right, finishes the less skilled portions by filling in his designs with red and black paint. She also polishes the vessels. (Photograph by J. Robert Estes.)

ments; fetching water; processing clay; mixing clay, water, and aplastics; forming vessels; scraping the surface; slipping the pot; polishing the surface; decorating the surface; gathering fuel; and firing the pot. Ethnographic studies of pottery producing societies reveal that different individuals may complete different tasks in the production of a single vessel (Figure 1) and sometimes multiple individuals (defined as separate biological organisms) work cooperatively to complete the same task for a single vessel (Kramer 1985:84, 1997:50–51; London 1986:511; Wright 1991:198). Indeed, Dean Arnold (1999:79) argues that increased task segmentation in making crafts is "an indicator of a more complex production organization," and is associated with specialized production. Observations of domestic workshops engaged in producing pottery reveal that essentially all family members contribute labor toward the workshop output, undertaking whatever tasks they can manage as children and gradually taking on more complex duties as they develop the ability to complete them successfully (Arnold 1999; Duncan 2000:96; Lackey 1982:127–8; London 1991:200–201). In peasant potting households, individuals may pay or barter for prepared clay, formed and dried vessels, or someone to fire their completed vessels (Arnold 1999:78; Estes 2001; Hagstrum 1999). Among urban potters in Puebla, Mexico, miniature vessels placed in children's graves are made by local potters (who make a variety of other vessels), but are decorated with pink and blue designs painted by individuals who come from another region annually to decorate only these vessels (Kaplan and Levine 1981:878). It appears that as production moves from the household to the workshop, so it often moves toward increasing task segmentation and group effort in completing the finished product.

Ethnographic studies also reveal that collaboration is sometimes a standard feature of teaching frameworks for children learning to make pottery. Competent potters may give their own vessels to novices to practice decoration techniques (Bowser 2000:227) or may allow novices to paint portions of largely finished designs (Bowser 2000:227; DeBoer 1990:88). Skilled potters may take the hands of the learner in their own to guide them in learning forming techniques (Gosselain 1998:94). Skilled potters also rework learners' vessels to prevent their efforts from failing (Hagstrum 1999:284; Hendry 1992; Lackey 1982:133; Nash 1970:55; Sillar 1994:52). Collaboration may be a fairly common aspect of the learning/teaching process in ceramic production.

For archaeologists these observations make studying the individual complicated, because in order to determine the input of the individual, we must first assess the possible input of multiple producers. Difficult as this may seem, consideration of the role of multiple hands in producing vessels alters our viewpoint by changing the focus of attempts to identify individual artisans with individual vessels toward situating the individual within a community of producers. We no longer assume that each artifact was the product of a lone artisan, but instead consider the possibility that many individuals contributed to the final product. Such a perspective enriches our interpretations because it considers the "invisible" producers who may have

aided with the less skilled tasks required to complete a vessel (Wright 1991:198). It also helps us to consider the possibility of task segmentation among producers even in less-complex societies. As importantly though, it helps explain some of the discrepancies in skill levels that are strikingly visible on some vessels.

In the American Southwest, many scholars working in the last twenty years have considered the possibility that multiple hands contributed to completing individual vessels. For instance, most researchers would argue on the basis of Southwestern ethnographies (Mills and Crown 1995), cross-cultural regularities (Murdock and Provost 1973; Skibo and Schiffer 1995), potter's toolkits in burials (Shafer 1985), and images of potters at work (Moulard 1984), that women *formed* vessels in the Mimbres area. Yet, several different studies conclude that men *painted* some of the designs on this pottery based on three different types of images: images of ritual (Brody 1977), images of distant fish species (Jett and Moyle 1986), and images of human birth (Hegmon and Trevathan 1996, 1997, although see Espenshade 1997; LeBlanc 1997; Shaffer et al. 1997). Evidence of dedicated ceramic workshops is lacking in the American Southwest, and most studies suggest household production, with perhaps part-time specialized production of some wares in some time periods. The Mimbres data suggest the possibility of task segmentation in pottery production as well.

Among historically documented groups living in the Southwest, men often decorated the pots formed by their wives, sisters, or other adult female relatives (Bunzel 1929; Guthe 1925:69; Ortiz 1979:288). Highly skilled potters sometimes decorated pots made by other, less-skilled potters, who were often relatives (Blair and Blair 1999:186; Kramer 1996:175; Nahohai and Phelps 1995; Naranjo 1992:106–107; Peterson 1997:57; Wyckoff 1985:120). In his study of San Ildefonso potters, Guthe (1925:69) notes that, for vessels made by women, men may either execute designs on their own or relieve a female potter painting a large design. Relatives sometimes helped polish vessels as well (Peterson 1997:63, 110). Tessie Naranjo's (1992) study of Santa Clara potters from three age groups (20–39, 40–59, and 60–90 years of age) indicated a shift from more communal activity in pottery-making among the oldest group to less-communal activity among the youngest group. She particularly found that collection of clay and wood and firing of pottery were communal activities in all three age groups, while forming the vessel and slip collection were individual activities in all three age groups. Interestingly, only members of the oldest age group executed designs on pottery collaboratively (Naranjo 1992:106–107, Figure 7). One of the oldest potters described how she decorated pottery for other women, and in return they would form pots for her from clay she prepared (Naranjo 1992:107).

Historically, Southwestern Pueblo groups emphasized cooperation and the community rather than competition and individualism. Even today, truly gifted individuals are viewed as those who not only possess special abilities, but also share those abilities with others through teaching or collaborating (Romero 1994). Sharing knowledge with other community members was thus potentially as important as sharing labor. Collaboration reflected societal values that promoted collectivism over individual action and recognition (Romero 1994; Rothbaum and Trommsdorff 2007). Even when a single individual performed all stages in the production of a vessel, the act of making pottery was viewed as a collaboration among a potter, ancestors who contributed their knowledge to the process, and a cosmological being (variously named, but often translated as Clay-old-lady or Clay Mother) (Babcock 1993; Nahohai and Phelps 1995:43; Naranjo1992:89).

My own research on how children learned to become competent potters in the past in the Southwest corroborates the presence of collaboration in completing some vessels. For this study, I examined thousands of whole decorated Southwestern vessels in museum collections. I selected 845 vessels for detailed analysis that appeared to be the work of learners because they were poorly made or poorly painted compared to the majority of vessels of the same wares. I evaluated the skill level of vessel construction versus vessel decoration separately. I determined the relative skill level involved in constructing a vessel by documenting the forming technique, finishing technique, vessel symmetry, form complexity, and form size. The relative skill level involved in decorating a vessel was assessed by examining the motor control, linework (both width and straightness), overlap at corners,

presence of errors, integration of different motifs, equality of motif proportions, and stylistic appropriateness of the design (see Crown 1999, 2001, 2002 for further discussion of attributes recorded). By comparing the level of skill evident in the finished products, I found evidence for collaboration between skilled and unskilled potters in four distinct ways. First, skilled potters sometimes formed vessels that were then decorated by unskilled potters. Second, unskilled potters sometimes formed vessels that were decorated by skilled potters. Third, skilled potters sometimes decorated one portion of a vessel and unskilled potters decorated another portion (Figure 2). Most often the skilled potter decorated the interior of a bowl or the body of a jar, while the unskilled potter decorated the exterior of the bowl or the neck of the jar. Finally, skilled potters occasionally painted most of a design and left a small portion for the unskilled potter to complete, most often a single motif or the hatching within a motif. In these latter cases, the unskilled individual was practicing motor skills without practicing creativity.

These types of collaboration are rarely documented for the ethnographic record in the Southwest (although see Olsen 2002:162, 230, who notes that Acoma/Laguna Pueblo potters sometimes give children formed vessels to practice painting or outline designs for learners to fill), yet they are clearly visible in the prehispanic record. As noted above, these types of collaboration are also documented among potters outside of the Southwest. They are indicative of a type of adult guidance known among educators as scaffolding. The skilled individual provides a scaffold for the learner's limited skills, as the learner moves from creating through cooperative activity with the teacher to working alone. There is an advantage to this type of guided learning; studies in developmental psychology show that children perform at higher developmental levels when working in collaboration with adults or peers than when working alone (Vygotsky 1978:86–87). The scaffolding extends a learner's current level of skill to a higher level of competence. In learning an entire task sequence, such as pottery production, researchers find that adult teachers intervene and provide scaffolding at the more difficult parts, allowing more independence for the easier steps in the process (Greenfield and Lave 1982:203).

The unskilled child may have been providing labor for completing vessels as well as extending their skill-level (Duncan 1999). When children provide labor for pottery-producing households, they generally begin with tasks that have the least potential to damage the completed products and often the monotonous tasks that do not require much thought; finishing decorations for skilled artisans freed the artisan to pursue other tasks that required greater skill and concentration.

Interestingly, given the goals of *The Individual in Prehistory*, such collaborative vessels are recognizable in assemblages not because we can recognize individuals in those assemblages, but because we can clearly recognize when we do *not* have a single individual completing a vessel. It is the discrepancies between the motor skills and quality of one portion of a finished vessel and the motor skills and quality of another that alert us to the fact that tasks were shared by more than one individual.

Multiple Hands and Vessel Renewal

There is also evidence that Southwestern potters altered pots through time, by reslipping, repainting, and refiring existing vessels (Crown and Wills 2003). The time frame for this alteration is not known, so it is not possible to evaluate whether it was the same or a different potter revising an earlier work, but the contexts in which such revised vessels are found suggest that the pots could have been decorated repeatedly by successive generations of potters. Evidence for such revised pottery is most clearly apparent on black-on-white pottery in assemblages from Chaco Canyon dating between about A.D. 900 and 1140, but it appears to be present also on black-on-white pottery from the Mimbres area dating to roughly the same time period. The revisions are evident in three distinct ways. First, some vessels have outer slip flaking off to reveal paint beneath the slip. Second, on some vessels, earlier designs and fireclouds show through later slip, much as *pentimenti* do on European oil paintings (Figure 3). Finally, some vessels that have been categorized as unpainted in fact have faint designs, which may be the remnants of fugitive paint designs or ghosts left from refiring the pots to burn out organic paint designs. It is possible that these latter pots were ritually cleansed of designs for later repainting, much as ceremonial masks and

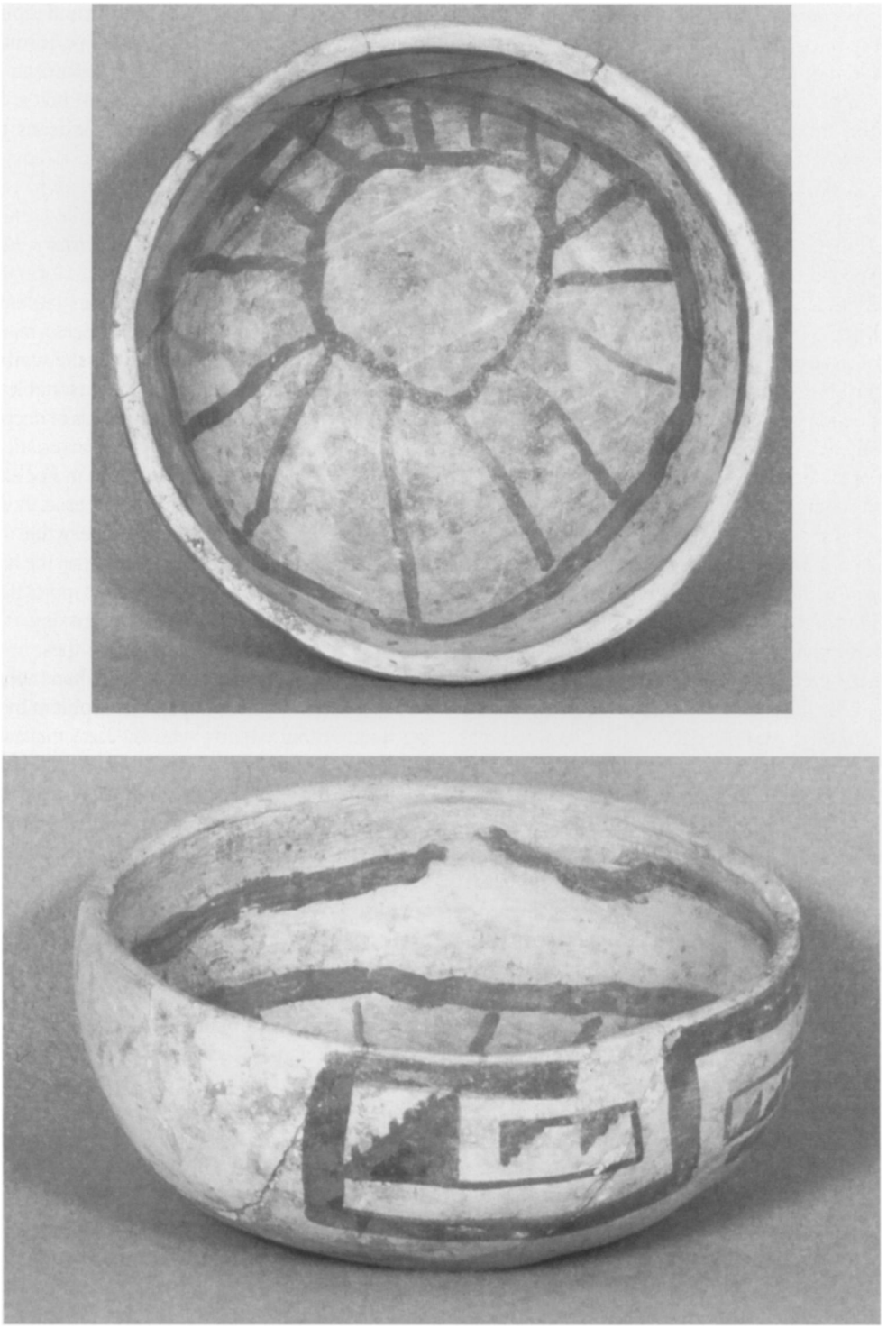

Figure 2. A Hopi Yellow Ware bowl from Shimopavi. An unskilled learner decorated the interior of the bowl, while a skilled potter formed the vessel and decorated the exterior. (Catalogue No. A157770, Department of Anthropology, Smithsonian Institution. Photograph by Marianne Tyndall.)

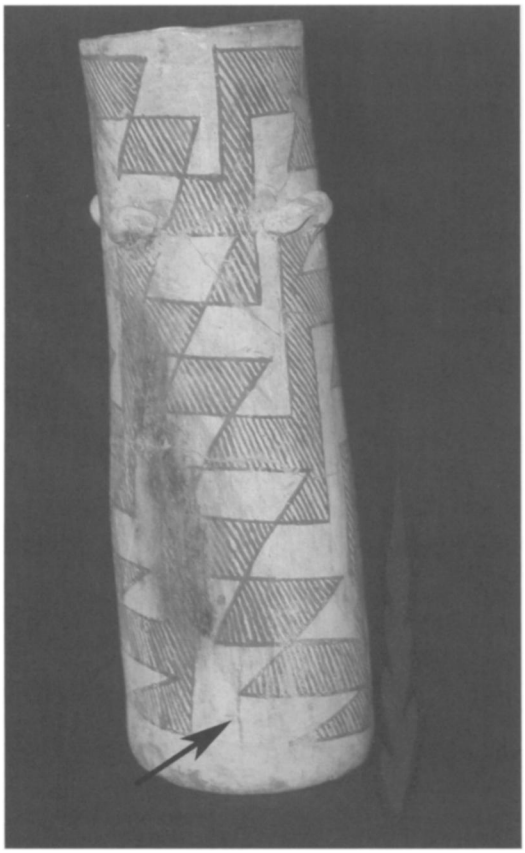

Figure 3. A cylinder jar from Pueblo Bonito, Chaco Canyon, New Mexico, with an earlier design visible (see arrow) beneath the slip and paint of the latest design. (Catalogue No. A336496, Department of Anthropology, Smithsonian Institution. Photograph by the author.)

kiva murals were cleaned and repainted repeatedly.

In a recent paper, W. H. Wills and I (2003) suggest that these vessels were used in rituals of renewal, with vessels refurbished with new designs and refired for continued use. Most of the vessels identified with such renewed designs come from ritual contexts and are unusual shapes (cylinder jars) suggesting special use, communal ownership, and continuing importance over long periods of time. It is likely that the designs were painted on such heirloom vessels over long periods of time by different individuals, creating receptacles of memory. In these cases, it is the historical linkage of different individuals working at different times in creating layers of decoration that forms a community of producers for each of these vessels. Such linkages undoubtedly enhanced the power and importance of these vessels for performing rituals. Indeed, the obliteration of one design and replacement with another was likely a ritual performance itself. Here again, it is not the individual artisan who is important as much as the position of that artisan within a diachronic community of artisans contributing to that single vessel.

The Changing Individual

In his chapter in *the Individual in Prehistory*, James Hill argued that "individual motor performances change little through time, indicating that temporal variability in individuals' motor performances should not interfere with identifying the works of individuals' (Hill 1977:57). Using personal letters written by British novelists over periods of decades, he analyzed their handwriting characteristics to show that each author's idiosyncratic motor habits in writing were different from the other authors as well as consistent over time. However, while these results are compelling, they are based on the handwriting of already skilled adults whose motor habits are set and unconscious; what is missing is the many years of practice that formed these motor habits as the future authors learned handwriting. Hill (1977:93) acknowledged this problem by citing handwriting experts who indicate that handwriting becomes consistent only after adolescence as the individual writes more, but Hill argued that potters would begin learning pottery at an earlier age so that stability in motor performance would occur much earlier on pottery designs than Western handwriting. My ongoing research on learning challenges this argument.

Like any craft, becoming a competent potter requires learning a sequence of tasks, each task involving motor skills and knowledge of materials, tools, and sometimes symbols and rituals. Learning in the context of doing is a lengthy process that entails moving toward error-free performance in practice; no individual, however old, begins or completes their first vessel as a fully skilled potter. Acquisition of skill takes years. Indeed, ethnographic studies of learning among potters reveal that the learning process can take from a few months to many years (Crown 2007; David and Kramer 2001; Roux 1989). Many potters do not consider themselves to be truly skilled until they are well into their adult years and often past childbearing when they can devote more time to the task of making pottery (Naranjo 1992). And many pot-

ters never master the largest, most complex forms (Bowser 2000:227; Kramer 1997:28), leaving production of these to the most highly skilled artisans in a village. The work of the individual potter alters throughout a lifetime of potting as skills generally follow a pattern of improving with practice to a plateau, and then gradual loss of skill if motor and cognitive processes lessen with advanced age.

In pottery-producing societies worldwide, learning to make pottery generally begins in childhood (Crown 2001, 2007). Because Hill focused on designs on pottery, I will focus on design learning as well. In most nonstate pottery-producing societies, children learn to decorate pottery by observation and imitation of skilled same sex adults. Children generally begin learning after age five and are expected to have mastered the basic skills in making domestic pottery by the marriageable age, generally around 15–16. Learning to paint designs in a culturally appropriate way requires motor coordination, cognitive maturity, and practice (Alland 1983; Biber 1962; Cox 1993, 1997; Deregowski 1980; Goodnow 1977; Krampen 1991). Just as very young children in our own culture must learn to hold pencils properly in order to write, so children in pottery-producing cultures must learn to hold paintbrushes properly in order to learn to decorate pots. The milestone of holding these tools with a precision grip comes at around age four, and from this age on, the fine motor skills involved in controlling these tools improve with repeated usage. But even as such motor coordination is improving, there are aspects of the growing brain that limit replication of culturally appropriate designs. It is not until age seven to nine that children in different cultures fully understand the style characteristics of their culture group and recognize the symmetry relations of those particular designs (Dennis 1940, 1942:347; Wilson and Wilson 1984; Wilson and Ligvoet 1992).

Highly complex design styles require longer learning periods than simple design styles and may require that children begin learning earlier in life (Roe 1995:48, 51). In his study of Shipibo-Conibo potters, DeBoer (1990:88–90) found that children begin with simple designs and a limited number of ways of combining them and gradually learn more complex forms and operations. He documents an 11-year learning period for this pottery. Where designs are highly complex and require a long learning period, the work of unskilled learners will deviate more clearly from the work of skilled artisans, making it easier for the archaeologist to recognize. Similarly, some forming techniques, such as wheel-throwing, require a longer learning period than simpler techniques, such as pinching or coiling (Roux 1989). Wheel-throwing is particularly difficult to learn because it requires acquisition of motor skills specific to the task that are not generally used in everyday activities, and that involve each hand/arm performing different, but coordinated actions (Roux 1989:68–70).

Neurophysiological studies of learning reveal that the early stages of motor learning require the direct conscious control and attention of the learner (Caine and Caine 1994; Minar and Crown 2001). The performance of the task is slow and prone to error. With repeated practice, segments of the task are grouped together (Schneider and Fisk 1983:122), allowing the brain to process parts of the task more quickly and efficiently. Eventually, the entire task no longer requires conscious thought, becoming automatic. Such automatic processing allows tasks to be completed with a minimum of attention and high level of consistency, which also requires extended, consistent practice (Schneider and Fisk 1983:138). This level of learning is desirable for behaviors that must be repeated frequently without change, particularly when high levels of production are required; skills learned to the automatic level are largely inflexible. When change IS required, the brain must downshift to controlled processing, which is slower, requires more attention, and is more prone to error (Schneider and Fisk 1983:120). For instance, typists who have achieved a specific level of automatic performance can increase their typing speed, but only by committing their full attention through active learning (Ericsson and Lehmann 1996:297).

As Tim Ingold (2001) argues, though, craft production involves synergy of human, tools, and raw materials embedded in a changeable environment. A critical part of skill acquisition then is the ability to adjust movement in response to "ongoing perceptual monitoring of the emergent task" (Ingold 2001:21). Thus, the highly skilled potter has had sufficient experience and practice to know how to assess and respond to minor variations in the vessel contour, surface finish, paint consistency, and changing brush flexibility, in addition to the spe-

cific weather conditions, noise levels, their own emotional state, and immediate environment. Highly skilled performance is not inflexible, but rather appears so because the skilled practitioner is able to make the appropriate adjustments to create a successful product despite variability in the environment (Roux and Bril 2005).

Hill (1977:93) notes that "the more expert a writer is, the less variability is exhibited in his motor performances, and thus the easier it is to distinguish his work from that of others." This same argument applies to decorating pottery or performing any other task requiring repeated motor performance; extended practice leads to automatic processing and results in consistent, error free performance. The more the artisan uses their skills in making and painting pottery under a variety of conditions, the more consistent the motor habits apparent on that pottery will be. Gaining that consistency requires both a lengthy period of learning to the automatic level and repeated doing, so that the performance is consistent.

Studies of expert performance across many fields reveal that the highest levels of performance require about ten years of daily practice, with a maximal practice time of four hours/day (Ericsson and Lehmann 1996). Individuals considered elite performers began such deliberate practice at younger ages than less-skilled individuals. The highest levels of fine motor skills, those skills that would be required for decorating pottery, peak in experts in their thirties, while the highest levels of creative and unique achievement for artists tend to fall in the thirties and forties (Ericsson and Lehmann 1996:278). However, these studies are of acquisition of skills that are not developed in everyday life activities. In traditional Southwestern settings, children grow up in households where ceramics are produced in a yearly round of activities and they routinely have access to household economic activities. Children become familiar with the routines before they are able to participate fully in them (Rheingold 1985); learning in such contexts generally takes less time. Furthermore, at least some of the motor skills used in pottery production are used for other daily activities, such as food processing, providing opportunities to develop those skills through practice beyond participation on pottery production.

The designs on the earliest decorated pottery in all portions of the American Southwest tend to be simpler than the designs on later Southwestern pottery. They contain fewer numbers of design elements, fewer brushstrokes, and simpler symmetry relations. Designs on later decorated pottery after about A.D. 900 are more complex, with more design elements, more brushstrokes, and more complex symmetry relations. While the late pottery is characterized by a wide range of recognizably different skill levels, the earlier pottery often is not (Figure 4). Instead, the early pottery is fairly uniform in skill level, and none of it is particularly skilled. These differences are, I believe, a function of the intensity of pottery production in these two different time periods (e.g., Roux 2003). The later potters painted more pottery and achieved a consistency in error-free performance characteristic of automatic, internalized learning. It is easy to distinguish the work of the skilled potters in these assemblages from the work of learners. In contrast, the early potters made few pots and probably scheduled these episodes of pottery production widely apart. There is little variation in skill level apparent in assemblages of these vessels, and little in the line work to suggest that potters had mastered design to an automatic level. Recognition of an individual potter would be extremely difficult if not impossible in these earlier assemblages.

I am suggesting, then, that in situations where potters work infrequently and on small quantities of vessels, their motor performance in decorating pottery remains throughout their lives at a fairly consistent, low quality level. Their performance never rises above controlled processing and is more prone to error. There is little variation in skill levels apparent in assemblages. In contrast, in situations where potters decorate high quantities of vessels, their motor performance improves as they move to automatic processing through extended, consistent practice. It is in these settings where archaeologists can most easily distinguish the work of the learner from the work of the skilled artisan, and probably also most easily distinguish the work of a single artisan from the work of any other artisan. Such learners took longer to achieve appropriate skill levels, but the higher volume output insured that their work was consistent and skilled once they had passed the learning period.

Although motor habits become highly standardized through repeated action, any craftsperson

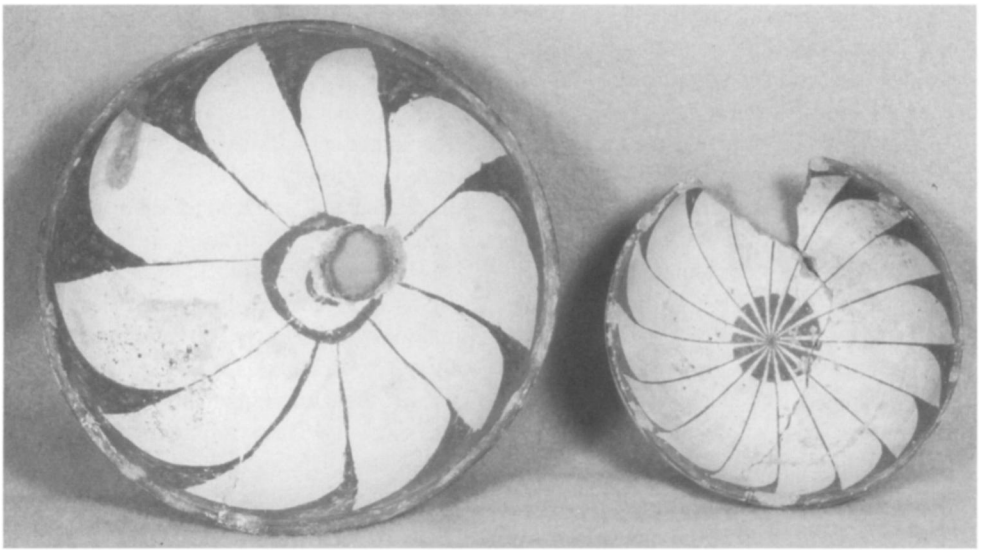

Figure 4. Two Mimbres Black-on-white bowls from the Galaz Ruin, New Mexico. Bowl on the right decorated by an unskilled learner attempting the flower design on the bowl on the left decorated by a skilled potter. (Collection of the Frederick R. Weisman Art Museum at the University of Minnesota, Minneapolis, Transfer, Department of Anthropology, University of Minnesota. Accession # 1992.22.210 2B-240 [vessel on left] and 1992.22.387 11B-493 [vessel on right]. Photograph by Marianne Tyndall).

may choose to create objects that are outside their normal repertoire, and such unusual items may not reflect the characteristic motor habits of the skilled artisan. Peter Roe (1995:49) discusses "realms of protected deviation," which are specific domains or audiences for nontraditional works. For instance, among the Cashinahua, adult potters make crude ceramics toys for their daughters in unusual shapes that would not meet with approval in full-scale versions (Kensinger 1975:64). Likewise, Hopi potters make small crude vessels as offerings for clay sources (Bartlett 1934) or as offerings for the fire to ensure a good outcome for the larger vessels in a firing (Blair and Blair 1999:159). Crudely made vessels were acceptable in these contexts, and were made by pinching and cursorily painted with slaps of a paintbrush (Crown 2002:114). Crude vessels matching this description are found in museum collections from the Hopi area. Because the vessels are made using nontraditional forming and decorative techniques, it would not be possible to identify these as the belonging to a specific corpus of work by a single skilled potter.

Implications

Recognizing and acknowledging collaborative craft products are important for a variety of reasons. First, if the collaboration is associated with task segmentation, where different individuals are responsible for a specific task or set of tasks in the production sequence, it may suggest a type of specialized production (Arnold 1985). When recruiting labor becomes critical to completing crafts, labor demands in all arenas of the household are likely strained.

Second, recognizing collaboration may be key to understanding learning and teaching frameworks. For instance, while ethnohistoric accounts of craft learning in the American Southwest emphasize observation and imitation with no direct instruction (Bunzel 1929; Fowler 1977; Hill 1982:139; John-Steiner 1975; Stanislawski and Stanislawski 1978), it is clear that learning in the past was more varied and sometimes involved collaborative production (Crown 2002, 2007). We will miss such changes in learning frameworks if we rely solely on written accounts and dismiss the possibility of multiple producers for individual works.

Third, the presence of collaborative vessels in assemblages challenges models that assume that all vessels are the work of individual artisans. For instance, the recent use of signaling theory to explain artistic elaboration on pottery (Bird and Smith 2005:230–231) has at its core the assumption that individual vessels were made and deco-

rated by individual women, with finer potters gaining social benefits through securing better marriages and subsequently sustaining political alliances. Engaging the labor of others in completing vessels might be viewed as cheating if such a model were rigidly applied. Yet the reality, as viewed from ethnohistoric records and the pots themselves, is more complex. As discussed above, ethnohistorically and in the present day, when collaboration is recorded among Pueblo family members, it is typically women who form vessels and men who paint them. The most visible "signals" are those applied by the male painters rather than the female potters. Interestingly though, when potters began signing their work at the behest of collectors, it was initially the women/formers who signed the pots rather than their male/painters (Peterson 1997:64), suggesting that it was the skill in forming, polishing, and firing the vessel that was most valued, rather than the skill in painting it. In my study of craft learning in the American Southwest, the pots that clearly demonstrate collaboration typically were not enhanced through the joint effort. Instead, the effort of the unskilled learner reduced the overall quality of the design. Such pots might signal the presence of an unskilled potter in the extended family, but probably would not do much to secure political alliances, if alliances were indeed created through displaying skill in crafts. Furthermore, there is some question of whether potters even living in the same community accurately identify the work of other potters (Bunzel 1929:65–67; Solheim 1984:98–99). Alternatively, for models whose goal is to define the choices made by an artisan (for example, Bernbeck 1999:97; Lemonnier 1993; Schiffer 1975) or the knowledge/experience of the artisan (Schiffer and Skibo 1997), it is necessary to consider the collaborative decisions of multiple hands in completing the tasks associated with making a ceramic vessel. One abiding choice for any potter may be to hand the work over to another person.

Finally, collaborative vessels raise interesting issues about ownership, use, and deposition. I first discuss the vessels with single designs executed by multiple hands. Ethnographic examples of collaborative work most often arise from situations where pottery is made for sale. Such vessels have value beyond their use as tools for the household. With the prehispanic vessels included in my study, it is unclear whether the collaborative vessels were made for exchange or not. As noted though, most were not enhanced by the collaboration, so that it is unlikely that the collaboration was begun as an effort to attract suitable exchanges. I saw no evidence that collaborative vessels were used or deposited in any way differently from vessels that seemed to be the work of a single craftsperson. Usewear, primarily abrasion, was present in roughly the same amount and in the same locations as other Southwestern whole vessel assemblages (Crown 2005). The vessels were apparently used for the same range of activities and at the same intensity. They were recovered in a variety of contexts, including trash, caches, rooms, a kiva, and burials. The burials included children and adults.

The situation for vessels with multiple designs painted over time may be quite different. Here, the life of the vessel may extend beyond the life of the artisan. Particularly in the case of the cylinder jars from Pueblo Bonito, the vessels appear to "belong" to the site rather than any single individual, as they were left in caches when the site was abandoned (Crown and Wills 2003). As noted above, the diachronic collaboration of multiple potters over time likely enhanced the value of these vessels. It is currently unclear what prompted repainting of the vessels, but many do exhibit usewear, and the vessels are found in various contexts, including fragments in trash. The multiple layers of designs might create a genealogy for the vessels, with generations of painters connected through their creative efforts on these important ritual objects.

The literature on the social life or cultural biography of things emphasizes that things take on their own histories apart from their makers or owners (Appadurai 1986; Gosden and Marshall 1999; Hamann 2002; Kopytoff 1986; MacGregor 1999). We know that the meaning of objects is partially constructed through context, so that a change in context informs of changing meaning. We do not yet know if a change in authorship informs of changing meaning as well, for those vessels whose designs were altered and replaced over time. Furthermore, although research on depositional contexts and usewear suggest otherwise, it remains possible that collaborative vessels had different use-lives from vessels made by individuals.

Conclusions

The innovative research highlighted in *The Individual in Prehistory* was the scholarly precursor of many recent directions in archaeological research. The suggestion that it was possible to view artifacts as the work of individual artisans provided an important impetus to analyze artifacts with renewed attention to details of motor habits and stylistic nuance that had not been promoted by assemblage-based questions of time and culture. It is probably inevitable that the path traveled in looking for the individual in prehistory should lead us back to situating that individual in the context of a community of practice (Lave and Wenger 1991). Through this process, we have come to understand that not only does each artifact reflect the role of the individual working within a community of craftspeople, but it often reflects the role of several community members working in concert or over time.

As children, budding artisans were guided by experienced community members, who were models for observation and imitation, critics of finished products, and sometimes collaborative partners in the creation of artifacts. Such collaborative work raised the skill level of the child artisan, while reproducing community standards for how to create. As skill increased, scaffolding was gradually removed, but aspects of this learning process are apparent in artifact assemblages despite the fact that we have little possibility of recognizing the entire portfolio of any one learner. Potters who attained a high level of skill through repeated practice had the most consistent motor habits, so that output is directly related to our ability to recognize the work of mature artisans. The higher the output, the more standardized the motor skills, and the more easily recognizable the work of the individual artisan. Yet even mature potters may choose to create objects that are outside the standard repertoire and unrecognizable as the work of that individual. Such objects may be frustrating for the archaeologist, but they also tell us a great deal about the domains in which deviation was accepted, or even necessary.

Where output was demanding, many family members provided labor toward completing the myriad tasks required in making pottery. Here, the invisible producers were critical to completion of the finished product, which was truly a collaborative effort. And where vessels were modified by reslipping, repainting, and refiring over time, the finished product held layers of designs as a repository of memory. The vast majority of the cylinder jars with multiple design layers were left in old storage rooms when the Chacoan site of Pueblo Bonito was abandoned. Whether the individuals who placed these vessels in these rooms believed they would return and reuse the vessels or knew they would not, is unknown. In either event, the vessels were not removed when the site was abandoned, probably because they were objects that were not the work of any individual or the possession of any individual. Instead they belonged within the confines of the community where their ritual use was enacted. They were inalienable objects (Mills 2000; Weiner 1992), but inalienable from that locale rather than from any segment of the population that once occupied it.

Through each of these examples, we come to understand that the individual artisan is best understood by situating them within a community of learners, a community of practitioners, and a lineage of producers. Acknowledging the possibility of multiple hands working together thus enhances our interpretations of the past.

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