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WHAT IS LOCAL?

Looking at Ceramic Production in the Peruvian Highlands and Beyond

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In archaeology, identifying what is local or not is crucial for defining interaction systems and interpreting sociocultural, economic, or political relationships. The review presented here examines the concept of “local” in ceramic analysis, when no direct evidence of production exists. Various North American and European research frameworks are examined, illustrated with several studies worldwide. The discussion is oriented toward the interpretation of ceramic data in Andean archaeology, emphasizing ethnographic and archaeological cases from the Andes. A shift in Andean ceramic studies is emerging, which takes into consideration the concepts of production styles, technological communities, and the construction of identity. Style and abundance are no longer secure criteria, and a contextual, multi-angle approach to the question of what is local is suggested.

HOW DO WE DEFINE WHAT IS LOCAL and what is regional? To what extent can a product be called local? How has this concept been applied in Andean archaeology? As a methodological contribution to the analysis of Andean ceramics production and circulation, this article looks at what can be called “local” when only indirect evidence of ceramic production is available. It presents various North American and European research frameworks used to describe what is local, from compositional and technological approaches to economic, structural, and sociocultural perspectives. This article also illustrates the range of data interpretation and production scenarios seen in ancient and traditional Andean contexts. However, it does not address issues of craft specialization or the organization of ceramic production in the Andes, which have been discussed elsewhere in detail (e.g., Costin 1991, 2001; Costin and Hagstrum 1995; D’Altroy 2001; Vaughn 2006).

In the following pages, I introduce the concept of “local” by looking at pastes, resource areas, and communities of potters. I review some of the contributions that have had a major impact on ceramic studies, and I present different factors affecting ceramic production, potters’ behavior, and distance to resources. I then turn to the concept of “local” in Andean ceramic studies, looking at what has been called “local” and on what basis. Last, I offer a look at new directions taken in ceramic research that expand the interpretation of the concept, taking into account the complexity of ceramic production and distribution, and the notion of space

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beyond physicality. Throughout the article, various theoretical approaches are examined, which explore not only what is local, but how local (or nonlocal) it is, and Andean examples are given to illustrate the different points discussed. Several of the concepts about local production presented here rely on ethnoarchaeological and ethnographic data. Although direct analogies should not be drawn from these examples, they do offer interpretive scenarios of very interesting depth to increase our understanding of ancient ceramic production.

“LOCAL” FROM A PASTE PERSPECTIVE

The question “Is it local?” is a cornerstone upon which further studies and higher interpretation rely. As Cathy Costin remarks: “The location of production activities must be identified . . . largely because the spatial context of production is used as primary data for inferring the social context of production” (2000:384). It is also used in economic and political research frameworks (Stark 1985:158–59). However, the location of ceramic production is, more often than not, difficult to identify when direct evidence is lacking. Ceramic characterization studies therefore offer crucial information about resource areas, ceramic manufacture, and technology. Compositional data must then be coupled with stylistic, environmental, ethnographic, archaeological, and other contextual data to improve our understanding of the ceramic production and distribution patterns embedded in a web of sociocultural, economic, and politic interactions.

Provenance studies are based on the postulate articulated by Weigand, Harbottle, and Sayre (1977:24) stipulating that sources of raw materials can be distinguished by their chemical (and mineral) composition and that the differences in composition between sources are greater than they are within a source. Thus, different paste groups can be recognized based on their mineral and/or chemical composition. These groups point to the use of different raw material sources or paste preparation, and ultimately to production areas and communities of practice. The identification of the local or foreign character of a ware is also tied to one’s knowledge of local and regional geology, and to comparison with materials of known origin (Arnold et al. 1991; Bishop et al. 1982; Rice 1987:413).

The link between a source and the community of potters using it is quite complex, and many collateral factors must be considered, such as the variability in sources of raw materials, resource procurement strategies and paste preparation (Arnold 2005:16–18; Arnold et al. 1991:79; Gosselain 2008; Kingery 1982:41). In addition, the type of raw materials, their processing, the size and abundance of the minerals or aplastics in the paste, and the recipes all reflect manufacturing processes as parts of a technological tradition. These paste characteristics can be used as indicators of local or regional production areas, social boundaries and distribution networks because they are less likely to change or to be influenced by consumer demand than decoration and style (Gosselain 2000:192; Stark et al. 2000:298, 324).

A SUBJECTIVE CONCEPT

The term “local” is subjective and has a strong spatial connotation. It may refer to an area that is restricted to a few kilometers around a community, to a valley, or to a region. Maria Zedeño (1994:14) states that “regional manufacture implies ceramic production by a number of communities among which common resources were exploited, by-products circulated, and technological knowledge shared. In this sense, ceramics may be considered local if it can be reasonably demonstrated that they were manufactured within a specific region.” In archaeology, “local” has often been defined on the basis of spatial distribution of style, abundance, or paste composition (Rands and Bargielski Weimer 1992:33; Rice 1987:413). However, style can be imitated, and potters commonly adapt their products to the market. The potters I interviewed in Peru (Druc 1996, 2005, 2011) all tell me that they can change the form, size, and decoration of their pots on request. For a potter, “local” is where he or she produces, even if the raw materials come from several kilometers away.

The abundance criterion (Bishop et al. 1982:301) is no longer considered an unequivocal identifier of local production either, as more and more characterization studies demonstrate that large numbers of ceramics on a site can be nonlocal, even in domestic contexts (e.g., Adams et al. 1993; Day et al. 1999; Heidke 2011; Triadan 1997). Also, nonlocal wares are not restricted to fine and decorated ceramics. The study by Miksa (1998) and Heidke et al. (2002) of Hohokam plain ware in central Arizona in the American Southwest contradicts the traditional belief that most plain, utilitarian wares are local. Miksa (1998:99) found that 98% of the plain ware at Grewe, a large Preclassic Hohokam site, was tempered with crushed schist, with the closest source located some 10 km from the site. Comparative studies and detailed analysis with petrofacies maps showing the mineral variability of sands in a particular valley revealed that several sources were used, suggesting multiple production loci and the use of materials outcropping 30 km away (Miksa 1998:98, 106).

OPERATIONAL TOOLS TO IDENTIFY WHAT IS LOCAL IN CERAMIC PRODUCTION

When direct evidence of production is lacking, the local character of a ware must be determined on the basis of different lines of investigation, while taking into consideration the many factors affecting production and ware distribution. In *Ceramics for the Archaeologist* (1968:336–41), Anna Shepard discusses the interpretation of ceramic data and the identification of intrusive pottery, stressing the importance of combining various sets of data. She advises looking at temper and technological evidence rather than stylistic ones to identify nonlocal (and local) wares, in particular when dealing with sherds and not whole vessels. Shepard also lists some of the situations that can jeopardize the identification of local and nonlocal productions (Shepard 1968:339, Table II). Her list includes the use of materials from another potting center, the sharing of resources, itinerant potters traveling with their clays, and relocated or immigrant potters using materials from

their original region or producing with their traditional techniques.

In the Andes, many examples illustrate the cases mentioned by Shepard. There are Inka and colonial cases of production by relocated potters (e.g., Acevedo 2004; Duviols 1986; Espinoza Soriano 1978; Hayashida 1999); local production with nonlocal resources by local or itinerant potters traveling with their materials and producing “local style” (e.g., Donnan 1971; Druc 1996; Ramón 2011; Sillar 2000); and local imitations of, for example, Moche, Nasca, Inka and Spanish wares (e.g., Acevedo 2004; D’Altroy 2001; Vaughn et al. 2006; Wegner 2000). Also, the artifact might have been manufactured in one location and decorated elsewhere—a process termed *duo-location* by Karen Mohr Chavez (1992:78, 86) when describing traditional ceramic production in Raqch’i, a community 120 km southeast of Cuzco.

The problem of identification of ceramic production—local or not—is approached differently by the (mostly) Franco-Belgian school, tapping into the concept of *chaîne opératoire*, originally defined for the lithic industry by André Leroi-Gourhan (1964, 1988:225). This concept relates to the steps of a product’s transformation from the raw material(s) to the final object, as processes embedded in a sociocultural environment. It helps identify technological traditions and ceramic production styles and has been extensively used for the Andean context by Guillermo De La Fuente (2011a, 2011b).¹ Different production processes may also exist for different ware types (e.g., domestic, elite, mortuary; Stark 1985:159). Court or elite potters will typically produce wares that can be distinguished by their higher craftsmanship, creativity, technology, and use of better and/or refined materials. The resource area, encompassing the different sources used around a site, may be similar for producing elite, burial, or common wares, thus yielding a local assignment to all. The study of a Moche workshop on the Peruvian coast illustrates this point. The workshop was excavated by Chapdelaine and colleagues (1995). It was associated with the ceremonial site of Huaca de la Luna (Department of La Libertad; departments are labeled in Figure 1) and produced figurines, ritual ceramics and decorated vases. Based on an INAA study including samples from a clay source 1 km north of the workshop, and from another within the periphery of the archaeological site, it was determined that the potters working in this workshop used local clay. The authors also observed that intra-source variability here was a function of depth rather than extension of the clay deposits (Chapdelaine et al. 1995:211). Domestic undecorated wares from the site, however, showed greater paste variability than the products from the workshop, and they did not closely resemble the local clays tested. The authors concluded that there must have been a tighter control of production for figurines and decorated vases for use at the ceremonial site than for domestic ware, which might even have been produced off-site. The examples given above show how diverse local production scenarios can be. We now look at a model that has been widely used to help identify what is local.



Figure 1. Political map of Peru, identifying the departments mentioned in the text. (based on a map by Daniel Dalet, <http://d-maps.com>)

How Far Is Local?

Dean Arnold set a milestone in ceramic production studies when he published *Ceramic Theory and Cultural Process* (1985). He not only stresses an ecology approach and investigation of source and paste variability, he also examines the behavioral, cultural, and economic factors affecting ceramic technology and production, venues suggested by Frederick Matson earlier (1965a:203, 210, 215; 1965b:279, 281, 285). Arnold's investigations in the Andes, Guatemala, and Mexico show the importance of combining ethnography and the analysis of the available potting resources to help understand ancient ceramic production (e.g., Arnold 1972, 1975, 1978, 1993, 2000, 2005; Arnold et al. 1991). In his ethnographic world tour of ceramic production strategies, Arnold examines the usual distances traveled on foot to get clay and temper, highlighting a "preferred territory of exploitation" of 1 km or less for clay or temper and an upper limit of 7 km for clay and between 6 and 9 km for temper (1985:50–52). This constitutes his "exploitable territory model" or the theoretical general limit for resource procurement beyond which obtaining the raw materials is uneconomical (Arnold 1985:35, 55). This does not apply everywhere, of course, and in the Andes straight-line distances can be very deceiving because of the extremely high relief. Arnold refines his threshold model in an article published in 2006, giving an upper range of 7 km for temper acquisition (Arnold 2006:7). He emphasizes that his model applies to foot travel and offers "crude probabilities" (Arnold 2006:4; 2011:85). The use of a pack animal or wheeled vehicle is considered an energy extender (Arnold 1985:37–38, 2006:86, 2011:89) that can push the threshold model beyond the 7 km general acquisition limit or allow fewer trips to the source. The transport of material to the potter's village by a specialist is termed "importing procurement strategy" by Bishop and colleagues (1982:318).

The "ceramic resource threshold model" is based on various assumptions, one of which being that distances to resources are patterned and cross-cultural, and another that "distances to ceramic resources approximate the energy costs necessary to obtain these resources and are not significantly affected by culturally specific or culturally relative criteria" (Arnold 2006:3, 7). This second assumption differs somewhat from perspectives focusing on culture, tradition, habitus, and social relationships when studying the potters' work, material acquisition, and production strategies (see Gosselain 1992, 2000, 2008 or Stark 2003 for a review of the social theory model). The latter perspectives complement rather than invalidate Arnold's threshold model. Whatever the theoretical approaches, distances to resources documented ethnographically approximate Arnold's initial proposal. Gosselain's review of walking distances to resources in Africa yields thresholds of 1 km, 3 km, and 5 km (for 1/3, 2/3, and 3/4 of the cases, respectively; 2008:70). Heidke and colleagues extended Arnold's ethnographic data bank to 73 cases, detailing not only distances to clay sources but also the type of temper used and the transport type (Heidke et al. 2007, table 5.1). They confirm a general limit of 3.3 km for on-foot acquisition of clay materials but remark that potters could travel further if accompanied by a pack animal (2007:149). In the Andes, llamas, horses, or mules often carry materials (Druc 1996; Ramón 1999; Ravines and

Villiger 1989; Sjömann 1992).

Building on Arnold's procurement model and Shepard's call for an extensive data base of potting resources in the area of study, Beth Miksa and James Heidke proposed a provenance definition based on detailed maps of available resources at a scale small enough to acknowledge variations at the kilometer level or so (Heidke and Miksa 2000; Miksa 1998). This allowed Miksa to differentiate between local sand tempers (< 1 km) and “behavioral” local sand (<3 km, Miksa 1998:92). A behavioral source is defined as a possible source and a common limit to how far prehistoric potters (in the American Southwest) would travel to collect their sand temper (Miksa and Heidke 1995:134). Ceramics with tempers acquired beyond 3 km were judged nonlocal (Miksa 1998:92). In a later article, Heidke, Miksa, and Wallace (2002:163–64) state that “local production is inferred when a sherd's sand-temper composition is the same as that of the petrofacies in which the sherd was recovered.” This definition relies on detailed geological survey. Rock temper (as opposed to clay or sand temper) could be acquired from up to 8 km away (Miksa and Heidke 1995:134, fig. 9.1).

What Dictates Choice?

Efficiency of production and proximity or availability of resources, however, are not always adequate criteria to identify what is local (Arnold 1985; Shepard 1968:337). A procurement area may be enlarged if special material properties are sought (Bishop et al. 1982:316–17; Fowler 2008:780–82). The choice of materials and acquisition strategies may be linked to cultural behavior or social ties, and the closest sources are not necessarily the ones exploited (e.g., Arnold 2006:86; Di Pierro 2002; Druc 2005, 2011; Heidke et al. 2002; Miksa 1998:106; Sillar 2000; Triadan 1997; see also Gosselain 1992, 2000; Lemonnier 1986; or Sillar and Tite 2000 for a discussion on technological choice). In the case described by Di Pierro (2002), potters of several Neolithic villages in Switzerland and France systematically used a specific granitic temper from one particular region, a custom that also suggests that paste recipes and resource areas were shared across villages several kilometers apart. Other ethnographic studies report cases of potters returning to their original home to get their materials even when they had moved to another area several hours away by foot (Druc 2011; Gosselain 2008:70), or cases of relocated potters still using “home” recipes and materials (Mason 1996:29). Bill Sillar gives examples of potters in the south-central Andes who established themselves away from their community but would still produce the same style of ceramics with material from their home village or with local clays (Sillar 2000:78). The limit of—or access to—resource areas and choice of a particular clay or temper mine can also be determined by political or social dictates and land ownership (Sillar 2000:69; Stark et al. 2000). This is well illustrated by Brenda Bowser (2000, 2005), who looked at social relationships and political alliances that influence procurement and exchange of raw materials in Conambo, in the Ecuadorian Amazon. She observed that sources can be located a few minutes from the production place or up to 50 km away if the potter wants to avoid obligations to the owner of the field (2005:26). Transport is by foot and/or canoe. For ancient procurement strategies in the Andes, the study by Sharratt et

al. (2009) has shown that although clay is extensively available in the Moquegua Valley of Peru, Middle Horizon potters (AD 600–1000) from Wari and Tiwanaku settlements would mine resources in different parts of the valley according to their respective cultural and political affiliation. Using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS), Sharratt and colleagues (2009) analyzed the variability of the clays within the valley and compared their signature with compositionally different ceramic groups (2009:812). This study revealed that the closest sources were not necessarily the ones used (2009:816). As well, the authors observed that Wari- or Tiwanaku-style ceramics were replicated using local material.

Thus, social and political affiliations or land ownership can determine in part how large the acquisition area and, consequently, the extent of what is local. These factors and many other sociohistorical and functional ones in turn influence paste variability (see Arnold 2000:339–57), which must be recognized as part of the “local” character of production. How far resources may be exploited also varies with acquisition strategies and the intensity of production. Olivier Gosselain found that when a large quantity of material is needed, distances to resources are usually within 1 km of the place of production (2008:70–71). Sporadic or seasonal production may allow for acquiring material from farther away, accumulating resources over time, or taking advantage of trips to or through the resource areas (Fowler et al. 2008:767; Gosselain 2008:70; Sillar 2000:69). In that respect, Gosselain, while studying resource acquisition strategies in Cameroon and Niger, observed that materials were collected within a “space of experience” and that the discovery of a source or its exploitation is often subordinated to other activities (2008:70). This space includes areas used for other practices, such as fields, gardens, dwelling places, roads, wells, or fishing sites, as well as areas of social interactions. In Morrope (Lambayeque), on the north coast of Peru, Shimada reports the exploitation of clay sources in the potter’s own field four hours from her house (1994:302). Finally, if a village or an area with good clay resources does not specialize in ceramic production, the clay sources could be mined by potters from neighboring villages. This is illustrated by the acquisition pattern seen in the Parish of San Marcos Acteopan, in the state of Puebla, Mexico (Druc 2000). There, seven of nine villages produce ceramics. However, they all obtain their clay near the non-potting village of Tepango, 15 to 20 minutes away by truck (about 10–12 km away), which specializes in growing tomatoes. Clay is either mined by the potters, bought already mined, or even brought to the potter’s workshop by traders. In summary, the location of a pottery center or workshop is not always linked to proximity, availability, or abundance of materials, and the local signature of the wares produced is often biased by behavioral strategies.

ANDEAN PRODUCTIONS: THE MANY WAYS OF BEING LOCAL

Our understanding of ceramic production in the Andes benefits from numerous ethnographic and ethnoarchaeological studies of traditional ceramic production, which are often used as comparative scenarios for the interpretation of the archaeological ceramic data (e.g., Arnold 1972, 1975, 1993; DeBoer and Lathrap

1979; Donnan 1971; Druc 1996, 2005, 2011; Hagstrum 1989; Mohr Chavez 1992; O’Neale 1976; Pozzi-Escot et al. 1993; Ramón 1999, 2011; Ravines and Villiger 1989; Shimada 1994; Sillar 2000; Sjömann 1992; Tello 1978). With the exception of studies mindful of the problematics of archaeology and ceramic analysis, early ethnographic accounts often mentioned distances to resources in terms of “local” or “close to,” or by giving a measure of time. With the rise of provenance studies in the Andes, closer attention is paid to resource location and procurement strategies, in conjunction with investigating the social, political, and economic factors affecting production. What “local” means, however, can vary for the potter as well as for the investigator. Most empirical studies taking distance into account rest on invisible assumptions that are objectivist. However, there is a clear limit to empirical interpretations when it comes to locality because it is a highly conceptual, relational, and social matter, rather than simply a physical one.

In the ethnographic literature, distances reported for the Andes show that in 67 % of the cases clay and/or temper is acquired less than 3 km from the place of manufacture, less than half an hour away.² However, a hike of an hour or more (5 to 7 km) with or without a pack animal is not rare in the highlands, and farther distances are also mentioned (Druc 1996; Ramón 1999, 2013). In addition, besides exploiting a wide resource area, a potting community can use a variety of sources concurrently. Gabriel Ramón (1999:226) reports the mining of 12 different sources for the sole producing center of Santo Domingo de los Olleros in the highlands above Lima, with distances ranging from 20 minutes to 2 hours 30 minutes on foot. Roughly converted to kilometers and assuming a highlander can hike 5 km in one hour, these sources are less than 500 meters from the potter’s house (four sources) to 5 km away for five sources, and 10 to 20 km away for three sources. Druc (1996:24) and Sjömann (1992:64) also observe cases of multiple sources being exploited by one potter or one community. Arnold witnessed this in Quinoa and highlighted that the dispersion of resources over diverse geological settings and dispersed settlement patterns would yield higher paste variation (2000:343). In these cases, compositional variability of the different sources used would constitute the “local” signature of the potting community. Another interesting problem is the sharing of resources by different neighboring villages or communities (e.g., Druc 1996; Mohr Chavez 1992), which may blur provenance identification. In that case, the production zone encompasses the different communities using the same sources. This is illustrated by the Marcajirca case presented below. Adequate distinction can be reached, however, providing one of the resources used is different or not prepared the same way, or paste recipes differ between the communities sharing resources. Arnold stresses that to accurately distinguish different potting communities, they should be 14 km or more from each other (2005:18), double the distance of his resource area model of 7 km radius around a production place.

Unreliability of Style

As seen above, style is not a reliable criterion for identifying what is local. Two Andean ethnographic cases illustrate this point. The first case involves the potting

villages of Jangala and Mangallpa in the Cajamarca Department in the north Peruvian highlands, 10 km apart (in a straight line). The potters use the same type of volcanic material and paste preparation, but technology, forms, and decorative style distinguish the two traditions: bivalve molds with incised designs are used in Jangala, while Mangallpa potters use coils and paddles to strengthen and decorate their pots (Druc 2011). The potters are aware of the different techniques used in each village but say they wouldn't know how to produce pots like their neighbors. However, there are exceptions. The petrographic analysis of a Mangallpa-style ceramic fragment found in Jangala proved to be a Jangala imitation. In an archaeological context, a stylistic analysis would have classified it as nonlocal. The other case of style imitation comes from the Callejon de Huaylas and Conchucos, in the department of Ancash, Peru. The well-known center of Tarica produces pots with the paddle-and-anvil technique and white painted decorations, which are traded far and wide. In the adjacent San Luis region of Conchucos Peru, the wares are manufactured the same way but are heavier owing to the addition of crushed slate as temper, and they are not painted. As a selling incentive, a potter in the San Luis area used to produce Tarica-looking pots, bathing them in or decorating them with limewater to get the white appearance of Tarica ware (Druc 2005). His products stood out in comparison to the other potters' productions in his village and the surrounding area, but the tools and the paste were "local." How would that be interpreted in an archaeological setting?

"Local" in Andean Archaeology

I now turn to archaeological examples from different cultural periods, where compositional analysis has changed our view of ancient ceramic production in the Andes. The results often defy the abundance, style, or distance criteria used to identify what is local, and show how paste composition can vary according to ware function. The first example presents the X-ray fluorescence (XRF) analysis of the ceramics from the Early Formative site of Piruru (1800–1500 BC) in the Central Peruvian highlands, by Catherine Rozenberg and Maurice Picon (1985, 1990). Piruru started as a small ceremonial center visited by semi-nomadic groups and transformed into a small village during the second millennium BC with an increasingly sedentary population. Three of the four ceramic types present at the site were found to be nonlocal when compared analytically with the local clays from the Tantamayo Valley. These ceramics were interpreted as part of the ware assemblage of seasonal inhabitants. Only one ceramic type grouped with the local clay samples on the dendrogram of the XRF data. This ceramic type is coarse, arrives late in the sequence, and is found concurrently with better-made nonlocal, but probably regional, ceramics (Rozenberg and Picon 1990:10–11). This pattern of differential evolution in ceramic production is rarely acknowledged in the Andes but is of importance in interpreting the nature and significance of local production. The presence of the nonlocal ceramics at the beginning of the site development is suggested to relate to the partial nomadism of the first occupants of Piruru, and not to be an indication of exchange networks (Rozenberg and Picon 1990:12).

An example of different production based on ware function is seen in the neutron activation study of early Nasca polychromes from the Early Intermediate period (AD 1–750) from Marcaya, a small settlement in the Rio Grande drainage (Ica Department), on the south coast of Peru (Vaughn and Neff 2000, 2004; Vaughn et al. 2006). The study reveals that the polychrome wares found on the site have a homogeneous paste and are not local, whereas utilitarian wares present local, heterogeneous compositions. A similar pattern is suggested for other sites in the valley upstream of the Early Intermediate ceremonial center of Cahuachi. It is estimated that 80% of the polychrome ware representative of Nasca style found throughout the southern Nasca region were produced near Cahuachi and distributed to the neighboring residential settlements. This conclusion is based on the study of 260 ceramic samples from excavated and surface collections and regional settlement survey in the southern Nasca region. One clay sample matched the main compositional group, and there is “growing evidence for ceramic production (in Cahuachi)” (Vaughn et al. 2006:687).

The standardized Inka state ware found at most Inka settlements throughout the Andes has been the topic of much research. Several studies were aimed at understanding whether these wares were made locally or distributed widely from centralized workshops. If local, would the production be done by displaced potters or by local potters using an imported technique and paste recipe? Cathy Costin (1986, 2001) highlighted the presence of several local wares and an Inka-style state ware in the Upper Mantaro Valley (Junin Department), a region of the central Peruvian Andes conquered by the Inkas in AD 1460. Petrographic analysis and a study of the concentration of ceramic production debris revealed that the local Wanka ware was manufactured in one town in the valley, using a single source (Costin and Hagstrum 1995:626). Cooking pots with a micaceous self-slip were also locally manufactured but with a different material, similar to that used in traditional production today. Finally, the painted Inka-style jars displayed different mineral and chemical compositions, suggesting a distinct manufacture locus and resource area located somewhere in the valley and producing for the region (Costin and Hagstrum 1995:626–27; D’Altroy and Bishop 1990). The same researchers also proposed that the imperial Inka-style jars found in the neighboring Yanamarca Valley were produced by local corvee labor, organized at the regional or provincial level (Costin and Hagstrum 1995:619; Costin 2001:235), and that only a few ceramics came from Cuzco (D’Altroy 2001; D’Altroy and Bishop 1990). Other studies in Peru, in the central highlands (Tschopik 1950), the Leche Valley (Lambayeque Department; Hayashida 1999), the lower Jequetepeque Valley (Department of La Libertad; Donnan 1997) on the north coast, and the Lurin Valley close to Lima (Makowski et al. 2008) have shown that long-distance ceramic imports were rare, that local techniques would be used to produce different styles, and that local wares were produced alongside Inka-style ceramics. D’Altroy and colleagues (1994:402) state that much of the Inka ceramics were produced for regional consumption using local materials and exhibit regional stylistic variants that distinguish one region from the other. This is also observed in the Calchaqui Valley in northwest Argentina, where

craft production strategies display differences between the northern and southern regions (D'Altroy et al. 2000:20). Alden and colleagues (2006), Hayashida et al. (2003), and Sillar (2012), each in their own way, showed that the production of the fine Inka ware was done using local materials.

A few studies stand out as a counterpoint to the above observations. Krzanowski and Tunia (1986:179) identified nonlocal Inka-Cuzco-style ceramics in the Cayash region of the Huaura River drainage, in the Junin Department (Figure 1) in the north-central Peruvian highlands. Petrographic analysis and Roentgen spectrography showed that these ceramics must have been produced in two different centers outside the valley because their mineral composition differs from the composition of the ceramics of the Cayash tradition. A group of Inka-Cayash ceramics was also identified, presumably produced in the region. Petrographic analysis indicated the mining of five sources in the region, one of which was only mined to produce cooking pots using a distinct recipe from the other forms (Krzanowski and Tunia 1986:175). Closer to the core of the Inka Empire, Ixer and Lunt conducted a study of Inka fine ware, Killke ware,³ and Plain wares (cooking pots and Inka utilitarian wares) from five neighboring sites in the Cusichaca Valley 80 km north of Cuzco (Ixer and Lunt 1991; Lunt 1988). The authors found that the plain cooking pots and Inka utilitarian ware showed greater paste variability than the decorated wares and had mineral compositions resembling the bedrock geology of the Cusichaca Valley. They were thus considered local (Ixer and Lunt 1991:155, 159). To the contrary, the Inka fine ware and Killke ceramics (representing respectively 20% and 15% of the valley assemblages) were not local and are very homogeneous in composition. They suggest these wares were produced in controlled workshops, probably in the Cuzco area. This conclusion was based on detailed petrographic analysis and comparison with local geology, clay test tiles made with alluvial clays from the Urubamba and Cusichaca rivers, and traded modern ceramic samples from production centers south of Cuzco (Ixer and Lunt 1991). These examples show the variable production strategies under Inka rule, using local materials and techniques to produce local and Inka-style wares.

Considering patterns of exchanges in the Mantaro and Yanamarca valleys before and during Inka occupation, Timothy Earle calls "local" the subsistence products and craft goods coming from within 10 km of a site (2001:300). His rationale for this cutoff relates to settlement density and organization, allowing for "direct access to a desired resource or the exchange for the commodity with a neighboring family or community" (Earle 1985:376–77). Earle (1985:376) calculates this distance to be 1.5 times the distance between contemporaneous communities (7 km in the case of the Yanamarca Valley). Indirectly, this definition rests, in part, on the idea that the flow of goods is organized according to social relationships (Murra 1975, 1985). The upper limit for the regional procurement zone (10–50 km) is defined in relation to the distribution of the ethnic Xauxa and Wanka populations in the Mantaro Valley (Earle 2001:306). This theoretical framework, however, may affect data interpretation. Earle's definition of "local area" implies that goods found on site A bearing the style of a neighbor settlement

B will be called local. Thus neither technological style nor resource location are taken into account to define what is local.

In summary, the above studies display a few regular patterns for the Andes. Fine or elite ware characterized by relatively homogeneous composition and more work in their production and decoration is produced in fewer production loci than utilitarian ware. The latter displays heterogeneous and coarser compositions, suggesting a multiplicity of recipes and production loci. This differential production scheme does not preclude the use of local resources and technology, even if the special wares or fine ceramics are crafted by recruited labor, local or not. Neither does it preclude the co-existence of different production types in the same community. Below are three additional examples presented in more detail to highlight the combination of archaeological, ethnographic, geological, and ceramic provenance studies used to tackle the “local” question and better understand ceramic production in the areas of study.

Ceramic Production at the Formative Ceremonial Site of Chavin de Huantar

Chavin de Huantar is a well-known ceremonial center of the first millennium BC in the Ancash Department, in the north-central highlands of Peru (Figure 2). It is viewed as a pilgrimage center (Burger 1992; Keatinge 1981) and is characterized by a temple structure with subterranean galleries, circular and rectangular plazas, and a highly identifiable iconography and style (Burger 1988; Keatinge 1981; Kembel and Rick 2004). With a high ceremonial and pilgrimage profile, a large estimated population (Burger 1992:168), and far-reaching ideological influence (Burger 2008; Rick 2005), many ceramics were expected to have been produced at or near the site. However, no ceramic workshop has been found so far. The site is in a narrow valley at an elevation of 3,400 m, and long sunny days are not common. Nowadays, sporadic ceramic production is only found in a few villages around the town of Huari 40 km north of Chavin.

To investigate the ceramics found at Chavin, petrographic, X-ray fluorescence, and neutron activation analysis have been conducted on 284 ceramic fragments from Chavin and other sites likely to have been in contact with that ceremonial center (Druc 1998, 2004). The results show that at the early stage of the occupation of the site, the ceramics (mostly cooking pots and jars) were produced with volcanic material (Druc 2004). When the site grew both in population and influence, a new raw material was used which included intrusive rock fragments of granodioritic composition. It almost totally replaced the volcanic temper. Sedimentary material was also used, and potters started to refine their paste for the production of fine bowls and bottles. When Chavin’s era was over, completely different source materials and paste recipes appeared. Comparative materials, sands, and clays were also analyzed. Some 30% of the ceramics from Chavin were found to be nonlocal, with compositions not compatible with the local geology. The rest was considered local, probably produced near or within 10 km of the ceremonial site using valley resources. The shift from a volcanic to a granodiorite-tonalite temper implies a different paste recipe and probably a different ceramic tradition. Other studies have demonstrated that ceramic traditions and technological styles derive

from learned behavior or choices dictated by the sociocultural traditions to which the potters belong (e.g., Gosselain 2000; Livingstone Smith 2000). It is thus tempting to draw a parallel between this new ceramic tradition and the growth of the site, witnessing different influences and the possible arrival of new potters.

The next example presents the case of Marcajirca, in the same region as Chavin, but of a later period and with a totally different history.

On-site Production or Trade? The Case of the Late Intermediate Site of Marcajirca, Ancash

Marcajirca is a high-altitude defensive site of the Late Intermediate Period (AD 1000–1476) near the town of Huari, in the Ancash Department. The site is located at an elevation of 3800 m, on a ridge over the Huaritambo Valley (Figure 2). It includes residential, public, and funerary sectors (Ibarra 2003, 2007). The ceramics found in Marcajirca are tempered with crushed slate, a material called *shashal* in the region. They display the same paste characteristics and temper material as the traditional ceramics from Acopalca and Yacya, two production villages around Huari, 6 km apart and 8 to 10 km from Marcajirca (see Figure 2). Cooking pots and jars of varying size as well as maize toasters are produced by women using the coiling technique and are traded over the entire Huari region (Figure 3). These potting villages also share resources (Druc 2005; Ramón 2013). Yacya possesses good clay; *shashal* is mined half an hour to four hours from Acopalca, in the mountains (Druc 2005). Ceramic production in these villages was already known in colonial times (Ibarra 2003; Marquez Zorrilla 1998), and the tradition was most likely present at the time of Marcajirca’s occupation.

Petrographic analysis of Marcajirca ceramics by Druc and visual examination denote the overwhelming presence of carbonaceous temper (Ibarra 2007). Of the 12 samples analyzed, 8 are tempered with crushed slate fragments, three have mixed slate and sedimentary grains, and one has a granitic to granodioritic (igneous intrusive) temper composition. The latter is probably of nonlocal manufacture. The other samples show small compositional variations suggesting multiple producers, as opposed to being the products of a single workshop. On-site production in Marcajirca, however, might have been difficult owing to the high altitude, cold weather, and lack of *shashal* sources and clay. In addition, no evidence of ceramic production was found. Thus, it is suggested that most of the wares are nonlocal and were probably produced in the region of Yacya/Acopalca, based on temper similarities. Wares could have been traded to Marcajirca, 3 to 5 hours away (8 km, geodesic distance), a walking distance not uncommon in the Andes. The possibility of on-site production with Acopalca material by itinerant potters from the Huari area, however, cannot be discarded. This tradition is reported for different parts of the Andes (Donnan 1971; Druc 1996, 2011; Ramón 2011; Sillar 2000:91–92, 98–99). In an interview, an elderly potter from Acopalca said she would hike to the hamlets above the village to make pots, taking only her tools with her (Druc 1996). There, the men of the community were in charge of obtaining and preparing the material as well as firing the wares. In other examples, as the next case will show, itinerant potters travel with their materials.

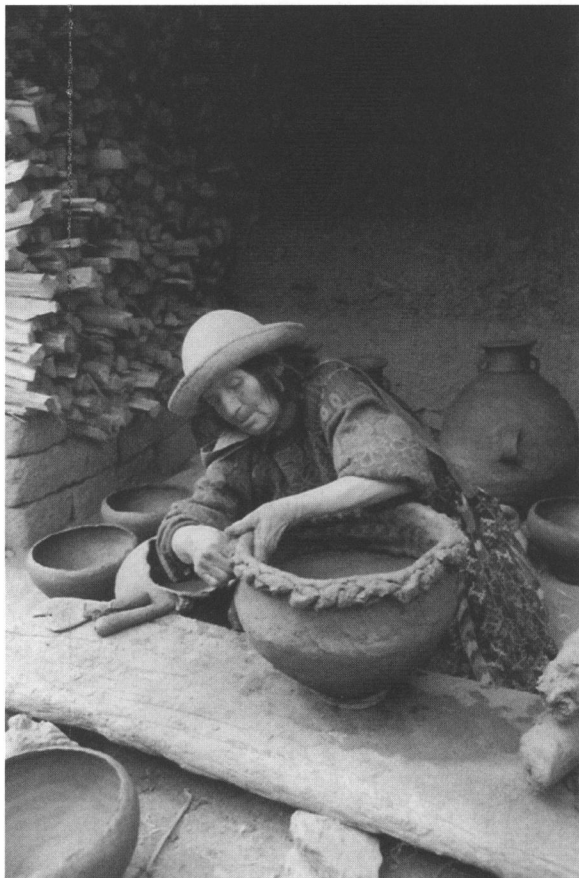


Figure 3. Example of local ceramic production in Yacya in the Huari region, in the Ancash department, Peru. Sra Anaseto Ocaña Janampa working on a coil to make a jar. (Photo by the author, 1997; reproduced with permission from Druc 2005: fig. 23a)

This situation is difficult to prove in an archaeological context and probably less frequent than off-site production. The latter option is examined below.

*Ceramic Production for the Formative Site of Kuntur Wasi,
North Peruvian Highlands*

Kuntur Wasi is a ceremonial site of the Formative Period (first millennium BC) in the Cajamarca Department, built on a hilltop at 2,300 m above sea level (Figure 4). The site has a number of terraces, platforms, plazas, lithic sculptures, and elite burials, which contained gold crowns, pendants, ceramics, and other sumptuary goods (Onuki, Kato, and Inokuchi 1995). Stylistic analysis suggests the presence of local wares and ceramics of nonlocal provenance and foreign influences suggestive of contacts with the coast and the north highlands (Inokuchi 2010). No ceramic workshop was found on the site. An on-going provenance study by Druc

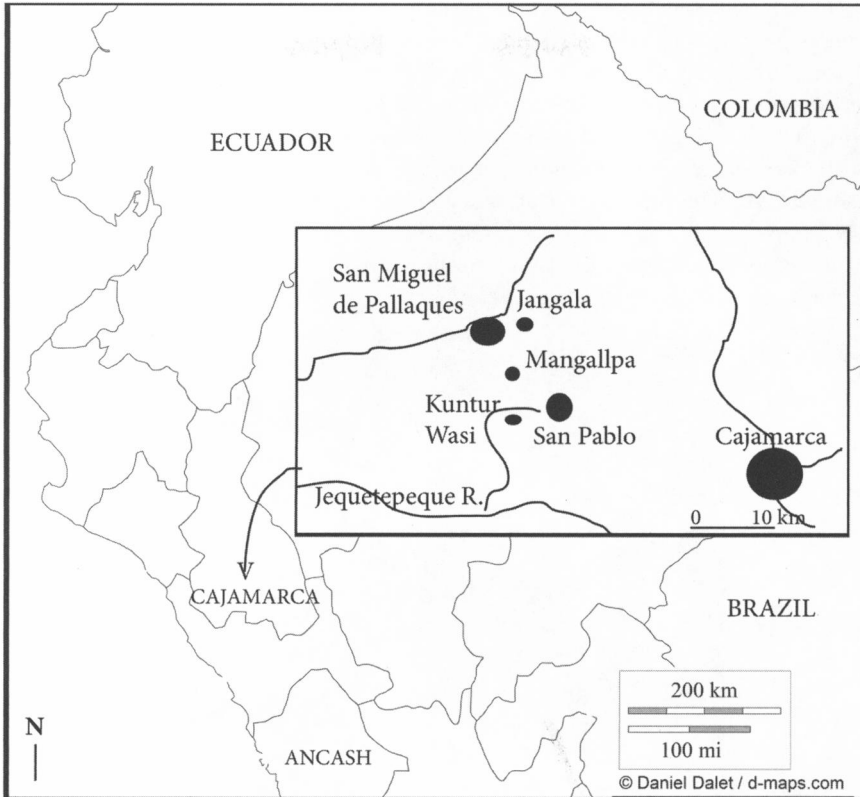


Figure 4. The Kuntur Wasi area, upper Jequetepeque drainage, showing the archaeological site, the nearby town of San Pablo, and ceramic-producing villages of Mangallpa and Jangala. (based on a map by Daniel Dalet, <http://d-maps.com>, and Druc 2011: fig. 1)

and Inokuchi has revealed that 30% of the ceramics are tempered with intrusive materials, which only outcrop 10 to 25 km from the site. The rest of the ceramics have volcanic compositions that match the local geology and the materials used in the contemporary production of traditional ceramics at Mangallpa, 7 km north from Kuntur Wasi. The village of Mangallpa is known for its production of domestic ware and for the fact that the potters are itinerant part of the year. Each Mangallpa potter produces some 300 pots a week on a seasonal basis. The wares—cooking pots and jars—are made and decorated using the paddle-and-anvil technique (Figure 5, Druc 2011). The clay is mined within the village limits (<2 km); the volcanic temper is excavated less than an hour away (<5 km). On Sundays and Thursdays, potters from Mangallpa walk down to sell their wares at the San Pablo market, three hours by foot (7 km). When leaving for long-term journeys, the potters travel with their materials, on foot or by bus. They used to

go to the coastal valleys, into the highlands, and up to Cajamarca 35 km away. Interestingly, potters interviewed in Mangallpa would not travel to places only 3 hours away, say to Kuntur Wasi; they prefer producing at home and carrying the wares down. Considering this, many of the ceramics found at Kuntur Wasi could have been produced off-site, in villages nearby. This would not preclude production close to the site by itinerant potters. If local and itinerant potters were using the same resource area, distinguishing between the two scenarios is difficult. The local concept, here, must be extended to a production area encompassing the matching resource area for on- and off-site production, which in this case would reach 8 km around the ceremonial site.

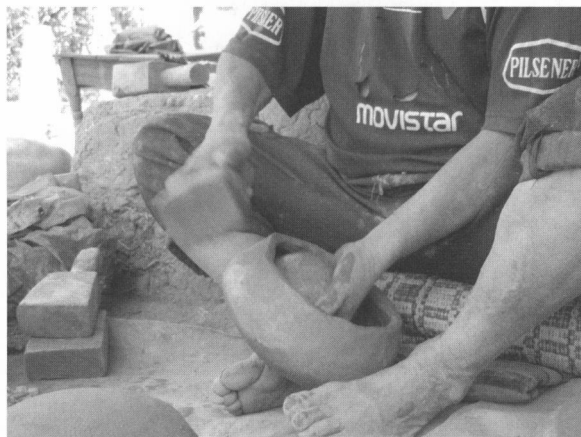


Figure 5. Ceramic production in Mangallpa, Cajamarca department, Peru.
Sr. Miguel Tanta Aguilar producing a cooking pot with the paddle-and-anvil technique.
(photo by the author, 2010)

DISCUSSION AND CONCLUSION

We have seen that several criteria can be applied to define what is local. Abundance, style, production locus, and paste composition should be combined whenever possible, along with archaeological, ethnographic, cultural, and environmental data. For the Andes, a preferred (67%) 3 km range is observed for the acquisition of clay or temper by foot, extending to 9 km as an upper limit. These distances can serve as a baseline to predict the extent of a production area in the Andes (production locus and resource area), and thus of what is considered “local.” In the highlands, these distances should be viewed as pheric (the time needed to cover the topography; Arnold 1985:33), and not as geodesic distances. As well, the use of an animal to transport material, as is often the case in the Andes, may extend the production area. It is also important to map the resources available and match them to the composition of the archaeological ceramics. Resource areas that extend beyond the threshold distance proposed by Arnold for ceramics found at a site can be interpreted in a number of ways. In the Andes, as in other areas of the world, the choice of procurement areas might be dictated by sociopolitical

factors, tradition, or personal reasons. These factors oblige us to define “local” on a broader conceptual scale, and to include the notion of technological tradition to circumscribe a production area, with a resource area that can be quite large. Fowler et al. (2008:783) state that “Zulu potters operate within knowledge transmission networks,” prospecting a resource area up to 30 km in range, even if they usually acquire their clays less than 3 km from their home. “Local” may have more to do with where and how a vessel is formed than with the origin of and distance to the raw materials.

Production strategies are so diversified that multiple conjoint scenarios should be envisioned as the rule rather than the exception. The local signature of a site can be characterized by a diversity of local recipes and raw materials used, in relation to the production of different ware types, or to the co-occurrence of diverse ceramic traditions and potters’ communities. Changes in clay acquisition and processing strategies are observed over time, resulting from a change in cultural practices and preferences for a certain granulometry, texture, and paste homogeneity (Fowler et al. 2008:768, 779, 782). Itinerant potters in the Andes introduce another complexity. They may produce pots complying with the style, forms, and/or decoration traditional to the villages they are visiting. Some carry their materials with them, others not, and in that case the wares are truly local even if the potter is not. Another variable to consider is the extent to which itinerant potters affect local productions, a question voiced by Matson more than 50 years ago (Matson 1965b:280). Local imitations of foreign styles are also frequent, but they can be spotted with paste analysis and comparison with local geology. In this case, the wares are compositionally local and stylistically nonlocal.

Several studies are refining the concept of “local” with detailed geological survey and paste analysis, revealing that multiple off-site and nonlocal production locations can supply a site with many ceramics. The idea that a large site could be a consumer rather than a producer of ceramics opens new perspectives for interpreting the dynamics of craft production and socioeconomic relationships at the intra- and supra-regional levels. Finally, many ethnoarchaeological studies repeatedly show the limitation of a materialistic approach and highlight the importance of looking at technological choices and production practices, which are often influenced by nontechnical or environmental factors, such as habit, tradition, kinship, culture, and personal interactions (Fowler et al. 2008; Gosselain 2000:192, 209; Gosselain and Livingstone Smith 1995:157–58; Livingstone Smith 2000:36–38).

Along the same lines lies the concept of *communities of practice* (Cordell and Habicht-Mauche 2012), rooted in Bourdieu’s (1977) practice theory, a research orientation that is sparking interest in Andean ceramic studies, as seen in the work of Makowski and colleagues (2008) in Lurin. In short, the abundance criterion is not reliable as a token of “localism,” nor is style, which can be imitated. Production of common, elite, burial, and domestic ceramics may imply different production processes, distribution and consumption patterns, resulting in different local and nonlocal signatures. These are best explored using the concepts of communities of practice and technological styles, coupled with paste analysis.

Ethnic *identity construction* is also a new trend in Andean ceramic analysis, explored in particular by Emily Stovel (2005). She studies how certain ceramic styles are created and consciously homogenized and standardized in response to local and regional political and economic changes (2005:147). It is as if sociopolitical changes reinforce the desire to build or preserve local identity. Stovel applies this research orientation to the case of the Negro Pulido ceramic tradition (AD 300–1000) of San Pedro de Atacama (Stovel 2002, 2008). This ware flourished as a distinct local production, was regionally traded, and remained practically unchanged for centuries, despite Tiwanaku influence and intensive regional and long-distance trade (2005:158). One could examine under this light the long-standing local ceramic technological tradition among the Aymaras despite Inka and Spanish colonization (Tschopik 1950) or the concurrent production of local wares and Inka-state ceramics in the Mantaro Valley (e.g., Costin 1986; Costin and Hagstrum 1995; D’Altroy 2001).

“Becoming local” is another process affecting the interpretation of ceramic data in archaeology. This phenomenon is rarely documented and deserves more attention. A few ethnographic and archaeological cases show that after some time, a foreign design, recipe, or the use of uncommon sources can become a local tradition. This is seen in cases of imitations, and of potters moving to or relocated into a new area (Bailey 1996:58–59; Mason 1996:29, 32–35; Mason et al. 1996:121, 129). At first, they may use familiar recipes and mine home sources if not too far away, and ceramic characterization would identify their wares as nonlocal. The new potters may later try local materials, which might result in a decrease in ware quality until a balance is reached. The adapted recipe or the new resource then becomes the norm. Shepard illustrates a similar case in which Pecos potters of the American Southwest experimented with local sand materials and glaze paint, enabling them to decrease the import of glaze paint ware once they mastered the technology (Shepard 1965: 70–71, 79–80).

Combining perspectives allows for the local label to acquire more depth. The debate is shifting toward a “space of experience” as Gosselain puts it (2008:33). As such, two additional conceptual frameworks may help understand space as an area of intelligibility for production: the first is Aristotelian, the second is postmodern based on Lefebvre’s concepts of social space and “Thirdspace” (1991:26–46) reinvested by the geographer Edward Soja (1996).⁴ For Aristotle, any space defines a space of intelligence, which implies a conceptual view of space because distance does not matter as much as meaningfulness and relation (Tochon 2002:85). Soja (1996) demonstrated on the basis of Lefebvre’s framework that space defines social strata fabricated for status, power, and relational purposes. “Thirdspace” asserts the existence of another order of things, non-physical, representational, in which the sense of sharing is the way to bridge distance. Future work might explore the significance of locality in terms of relation and sharing, which would help transcend the limitation of our physical appreciation of distance.

The methodological guidelines that can be derived from the above review of literature in regard to the concept of “local” for the interpretation of ceramic production are several. Besides the need to specify which conceptual tools and

theoretical framework are used, the definition of “local” should be contextualized. The different levels of “local” intelligibility viewed in this article are summarized below, by order of increasing complexity of interpretation. They relate to seven spheres of understanding: physical, statistical, technological, economic, social, political, and conceptual or representational. Each can be differently approached, but guidelines can be proposed for interpreting Andean ceramic data:

1. Use threshold distances to resources of a 3–9 km range to reflect the Andean context, converting distances to account for the topography.
2. Conduct geological and ethnographic surveys and obtain comparative samples.
3. Determine a “space of experience” to circumscribe the acquisition area.
4. Identify as possible identity markers the technological style of the wares analyzed.
5. Consider the different production scenarios known for the area and time period studied.
6. Integrate the cultural, socioeconomic and political factors that may have affected production.
7. Examine changes in production tied to social, economic, or political changes in the region and to the construction or reinforcement of group identity.
8. Explore the meaningfulness of “Thirdspace” to move beyond materiality when identifying what could be local.

This approach goes beyond the identification of “local” based on direct or indirect evidence of production. It includes on- and off-site manufactures, multiple production settings related to ware types and targeted customers, and possible co-occurrence of various technological styles as testimony of the coexistence of different communities at the local level, however “local” is defined.

NOTES

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1. See De La Fuente 2011a; Gosselain 2000; Livingstone Smith 2007; or Roux 2011 for application of the concept of *chaîne opératoire* to ceramic production.

2. Distances were computed from ethnographic data for the Andes ($N=34$) available in Arnold 1985, 1993; Druc 1996, 2005, 2011; Hagstrum 1989; Ramón 1999, 2013; Ravines and Villiger 1989; Sillar 2000; and Sjömann 1992. When time was mentioned, it was converted to kilometers, estimating that 1 h walking meant 4 km in the sierra and 5 km on the coast.

3. Killke wares are decorated, predate Inka wares and are found in the Cuzco area since the middle of the first millennium AD (Ixer and Lunt 1991:141).

4. See Tochon (2002:83–95) for a discussion of Lefebvre's and Soja's integrated definitions of space.

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