

**SOCIAL PROCESS AND CULTURAL TRADITION:
AN EXAMINATION OF ANCIENT SPINNING TECHNIQUES
IN THE NORTHERN SOUTHWEST**

By

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Introduction

Weavers and spinners conjure up images of the provider, creating fabrics that serve a variety of purposes for everyday life. Unfortunately, in the American Southwest these perishable materials rarely make it into the archaeological record. Only under pristine preservation conditions does textile preservation occur. More often the weavers' tools such as spindle whorls, loom parts, loom holes, battens and needles, have a higher chance of survival than the perishable raw materials (Figure 1).

A spindle whorl is one of two items used to spin yarn and thread (Figure 2). Initially, the spinner twists raw fibers around a spindle tip – usually a thin, wooden shaft. In maintaining a continuous motion, the right hand controls momentum and the left hand constantly pulls out fibers. The thread is then wrapped around the spindle shaft above the spindle whorl (Kent 1957; Teague 1996).

Several attributes affect variation in spindle whorl properties, particularly whorl weight and shape, spindle shaft diameter and length, spinning technique, and the intended size of yarns produced (Teague 1998). Changes in whorl weight are reflected in differences in whorl material type or densities, whorl thickness or outer diameter. Overall, however, all of the attributes contribute to the size and weight of the whorl.

Background Research

Generally speaking, spindle whorl research has focused on spindle whorl attribute variation and how it could reflect differences in fiber types spun. More specifically, Parsons' (1972) often cited work from the Teotihuacan Valley, examined issues regarding spindle whorls as indicators of interregional trade, exchange, chronology and organization of production.

Moreover, she created a functional typology distinguishing between whorls used for cotton production and whorls used for maguey (*Agave* spp.) production.

Many archaeologists used Parsons' cotton/maguey typological criteria to interpret spindle whorl assemblages in the Greater Southwest (Howard 1989; Kisselberg 1987; Spoerl and Gumerman 1984; Winthrop and Winthrop 1975; Wilcox 1987). Teague (1996, 1998), however, turned to the ethnographic record to test whether or not spindle whorl attributes actually correlated with specific types of fiber. She alternatively found (Teague 1996, 1998) that fiber type correlated with the intended yarn size which ultimately determined whorl attributes but within a great deal of variation (Teague 1998:45). As a forewarning, Teague's ethnographic comparison in conjunction with her experimental studies revealed that the methods and technology of yarn production while a complicated process must be thoroughly understood prior to any interpretation of archaeological assemblages (Teague 1998:31). Teague's (1996, 1998) detailed study provided me with several alternative perspectives for analyzing whorl variation in the North American Southwest.

Through an analysis of spindle whorl attributes I reexamined the archaeologically-defined cultural boundaries in the Northern Southwest. I found that the people living on the Colorado Plateau after A.D. 1000 practiced two different spinning techniques (Figure 3). The Eastern, Kayenta, and Winslow Branches of the Anasazi, the Cohonina, and the Wupatki area, although defined as separate cultural traditions via the normative architectural, ceramic, and lithic attributes, practiced a similar spinning technique -- thus, representing Group 1. The Northern Sinagua -- Group 2, on the other hand, practiced a distinctly different spinning method. Ethnographic descriptions of Hopi and Zuni spinning techniques resemble Group 1's spinning methods while Group 2 is more comparable to ethnographic and archaeologically known

techniques found in Southern Arizona and Greater Mesoamerica. Today I plan to present the results of a temporal, spatial and functional spindle whorl analysis briefly describing the patterns found and illustrating the methods used to distinguish between the different spinning techniques. Additionally, I explore how people in a certain area come to share a particular spinning technique or technological tradition (Stark 1998) and thus have an identity that cross-cuts boundaries originally defined by using the normative culture tradition approach.

Cultural Affiliation Spindle Whorl Analysis

The purpose of the data analysis was to first describe spindle whorl variation and how it may identify different spinning functions and techniques. Using the results of the analysis, an examination of whorl spatial variation across the well represented Pueblo II to Pueblo III cultures determined if different spinning techniques correlated with different cultures. A correlation between culture and technique represents the identification of a spinning technological tradition.

Assumptions

Three primary assumptions accompany this analysis. First, I assume the spindle whorls were used at the site collection area. I do not know if the spindle whorls came from primary use contexts but I assume they represent that production activities occurred on the site. Second, many of the wood whorls probably did not survive therefore masking the variability present on the sites. However, I analyzed the variation of the artifact classes present.

Finally, I assumed that the different variants identified were different technological traditions (Stark 1998). Presumably, the different variants were a product of differential distribution in cultural contexts. For instance, a majority of the Kayenta wooden whorls originated from Kiet Siel. The whorls could have originated from one room or distributed across the site.

Consequently, my lack of knowledge regarding cultural context obscures the information regarding variant representativeness. However, the analysis provides a starting point for further inquiry regarding the integrity of a spinning technological tradition.

Temporal and Spatial Analysis

A regional temporal and spatial analysis of 353 spindle whorls from the Museum of Northern Arizona (MNA) collections revealed that the earliest ceramic, wood, and modeled whorls on the Colorado Plateau dated to the Basketmaker III period and occurred in the Kayenta region (Figure 4). Ceramic disk whorls occurred in all the cultures depicted in the study area. Of the 215 circular, perforated worked disks – or ceramic disk whorls (Figure 5)– 81% dated to the Pueblo II through to the Pueblo III periods with 3% dating to the Basketmaker III and early Pueblo periods, and only .46% dating to the Pueblo IV period.

A total of 29 wood disk whorls (Figure 6), while similar in shape to the ceramic disk whorls were actually larger and thicker due to their light weight. A majority of the MNA wood whorls (55%) originated from the cliff house site, Kiet Siel and dated to the Pueblo II through the Pueblo III periods. The remaining 45% came from open air Kayenta branch sites and Wupatki. The three open air Kayenta sites dated to the Basketmaker III period whereas Wupatki dated to the Pueblo III period.

Seven stone disk whorls occurred within the MNA collections and only four were complete with culture area designations (Figure 7). They were similar in shape to the ceramic and wood whorls but were lighter, thinner and smaller. Two Kayenta stone whorls dated to the Basketmaker II and III periods, however, their physical properties all fell within the range of variation for the Hopi pump drills. The other two stone whorls were from Wupatki and dated to the Pueblo III period.

Modeled whorls are small, round, bead whorls (Figure 8) that occur in a variety of forms. A majority (96%) of the modeled whorl sample came from the Flagstaff/Northern Sinagua region whereas two occurred in the Kayenta heartland. One of the Kayenta discoidal type whorls was larger and heavier and fell within the range of Hopi pump drills (Figure 9 and 10). The second Kayenta modeled whorl was stylistically unlike any of the Northern Sinagua whorls. All of the Northern Sinagua whorls dated to the Pueblo II through the Pueblo III periods. The only site with an earlier date was a Kayenta multi-component Basketmaker III/Pueblo II period site.

Functional Analysis

The functional analysis of each material type indicated that the ceramic, wood, and stone disk whorl inner diameters were statistically similar at the .05 level (Figure 11). The Northern Sinagua modeled whorls, on the other hand, were distinctly different with respect to inner diameter. The wood and modeled whorls had comparable outer diameters, however, the wood whorls were significantly lighter than the modeled whorls. Interestingly, the thinnest and lightest of the four material types were the stone disk whorls with the wood whorls being slightly heavier. The differences in shape and the significantly smaller modeled whorl inner diameters in conjunction with ethnographic descriptions suggested the ceramic disk whorls versus the modeled whorls were used in different spinning techniques. Perhaps the light stone and wood disk whorls were used in a similar technique as the ceramic disk whorls yet for the creation of a finer yarn.

Discussion and Conclusion

Teague (1996, 1998) and Kent (1983) make a good argument based on yarn structure that the most common fiber type spun during this time period on the Plateau was cotton. However,

comments made by Mc Gregor (1941) on Sinagua perishable textile materials suggests some of the MNA spindle whorls were perhaps used to spin agave or yucca.

Zuni and Hopi ethnographic descriptions and archaeological specimens of disk whorl locations on spindle shafts originating from the Kayenta Anasazi region suggested the prehistoric whorls were used in a similar technique much like the Hopi and Zuni methods (Figure 12). Both groups employed a longer spindle that was primarily supported on the thigh (Teague 1996, 1998). If all the disk whorls were used to spin cotton then I presume the statistical significance between disk whorl inner diameters represents the use of a horizontal, thigh supported spinning technique.

Alternatively, the Northern Sinagua modeled whorls had a smaller, shorter spindle shaft evidenced by a small inner whorl diameter. The smaller, heavier, beaded forms are consistent with ethnographic descriptions of modeled whorl spinning techniques.

No ethnographic accounts describe a modeled whorl spinning technique at any of the Southwest Pueblos (Kent 1957). However, several ethnographic descriptions exist in the literature concerning modern Mesoamerican textile production (Cordry and Cordry 1968; Smith and Hirth 1988; O'Neale 1945). O'Neale (1945) described modeled whorl spinning techniques in the highlands of Guatemala. The spindle shaft was similar to Southwest Pueblos in that it was a thin, rounded stick with a tapered end. Unlike the pueblo disk whorls where the whorl was located higher on the shaft (Teague 1996), the Guatemalan whorls sat much lower (Figure 13). Moreover, the spinner set her spindle in a shallow bowl or gourd, or "on a broken dish" (O'Neale 1945:8). The Mesoamerican technique provided more twist at a quicker rate than the Pueblo techniques. Yet, an experienced spinner could create a functionally equivalent yarn at an equal

speed with the same amount of twist using the horizontal, thigh supported technique (Teague, 1996 personal communication).

Bartlett (1854, in Teague 1996, 1998) noted a similar technique among the O'Odham and Maricopa of southern Arizona and northern Mexico. Yet, the whorl was a small wood block. Thus, if all the Northern Sinagua modeled whorls were used to spin cotton, I suspect the statistical difference between the modeled and ceramic disk whorls represents differences in spinning technique. The modeled whorls were used a similar fashion to Mesoamerican spinning techniques and the ceramic disk whorls were used in a horizontal, thigh supported technique. While I am unclear how the Northern Sinagua used the ceramic disk whorls, Teague (1998) argues that the horizontal, thigh supported technique extended from the Colorado Plateau to as far south as Zacatecas.

This pattern begs the question -- Why do the Northern Sinagua people choose the technologically distinct Mesoamerican-like technique after A.D. 1000 (Figure 14)? Kent (1957) suggested the presence of the modeled whorls in the Sinagua region was a product of diffusion from the south -- a Hohokam trait in the Sinagua region or perhaps a product of distance-decay from the more southern cultures. The modeled whorls were commonly found on post-A.D. 1000 west Mexican coast, and southern Arizona sites, and areas directly influenced by the Hohokam such as the Verde Valley, Prescott, and the Flagstaff area (Kent 1957). Kent (1957) and many others (Colton 1932; McGregor 1936, 1941; Schroeder 1977; and Stanislawski 1963) have traditionally used the migration model to interpret the southern traits in the Sinagua culture. I agree with Kent's (1957) observations that the modeled whorl technology had a southern origin. The forms are strikingly similar and the attributes are statistically similar to the Hohokam modeled whorls. I think, however, that the Northern Sinagua people on down through the Verde

Valley, the Hohokam and northern Mexico shared a salient social identity (Schortman and Nakamura 1991) that coalesced around a very active exchange network focused on a number of trade items (Bradley 1996). Today, I am specifically interested in how the cotton trade and the similar spinning traditions linked these regions.

Current research (Huckell 1993; Kent 1983; Magers 1986; Teague 1998) suggests the cotton plant does not show up on the Plateau until after A.D. 850. The agricultural limitations confined it to hot, low lying locations with an extremely long growing season. Within the northern Southwest, locations with the latter restrictions are rare.

Prior to the arrival of cotton cultivation on the Plateau, cotton textiles appeared in archaeological record with no associated production tools (Kent 1983). The difficult to obtain cloth presumably was a Hohokam trade product (Kent 1983). Due to the great distances traveled the items carried a certain amount of prestige during the early pueblo periods. The prestige carried over into the later pueblo periods substantiating the extra effort entailed to maintain a crop. The demand for textile products may have resulted from its mounting value not only as a highly versatile trade product but also as ritual paraphernalia.

Spinning techniques, like design styles, more often than not reflect apprentice choices (Stark 1998). Consequently, the choice of one particular technique reflected the spinner's desire to affiliate themselves with those people controlling the resources – such as cotton. In an effort to move away from defining spatially distinct cultures, the social identity concept identifies interaction networks maintained by social categories (Schortman and Nakamura 1991:313). In this case, the social relations with the South appeared more fluid with respect to yarn technological traditions when compared to the northern Plateau cultures – or Group 1.

The post-A.D. 1000 spindle whorl assemblage of the northern cultures -- or Group 1-- suggested they were not a part of the communication network of sites that linked the Northern Sinagua proxemically, ideologically, technologically and socially with peoples from the Southern Greater Southwest (Schortman and Nakamura 1991). Rather the sharing of ceramic styles (Samples 1996, personal communication; Wilcox 1993), yarn technological traditions (Neff 1996), and textile structures (Folb 1996, personal communication) specific to the Cohonina, Eastern, Kayenta and Winslow branches of the Anasazi, and Wupatki, suggest Group 1 generally, and the Kayenta Anasazi specifically, had a deep rooted spinning and weaving tradition that dated back to the Basketmaker III period. The shared spinning tradition signifies identity at a broader scale creating solidarity for numerous local groups over an extensive region. No incentive existed for Group 1 to adopt the new technology.

Clearly, the framework of culture tradition is inadequate for explaining this pattern. Instead, I use the framework of social process and find Group 1 represents an in situ spinning tradition with a developmental trajectory spanning back to the Basketmaker III time period (A.D. 700 – 900). Group 2, on the other hand, shares a salient social identity (Schortman and Nakamura 1991) with southern, more Mesoamerican spinning traditions. In sum, this juxtaposition of the cultural tradition and social process perspectives leads to a more subtle explanation and understanding of the people and cultures of the Northern Southwest.

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Therefore, the cultural processes and mechanisms triggering the widespread appearance of domesticates in the late third millennium are still elusive. In this study, we take advantage of the abundance of archaeological horse remains from the central Anatolian plateau (20 , 42 – 46) to provide the first rigorous test of the hypothesis of Anatolian horse domestication applying paleogenetics. These findings interpreted as suggesting that the mobility of wild horses in northern Eurasia allowed constant population reshuffling and repeated recruitment of wild local mares, precluding the establishment of a phylogeographic structure (52 , 53). Beginning with my thesis research, I examined the ancient economy of Pueblo spinning in the northern Southwest. I investigated spinning at the culture area unit of analysis therefore examining craft specialization at a very gross scale. Building on previous work in the Northern Southwest, I examined yarn spinning technique within and between the ever familiar cultural boundaries archaeologists have defined based on artifactual and spatial similarities and differences. Theoretically, relatively discrete cultural units occur in the northern Southwest -- the Winslow, Kayenta, and Eastern Anasazi, as well as the Cohonina and Sinagua and Mogollon. For each production group, the social processes leading up to the cultural distinctions follow two separate trajectories. There are more than 200 countries in the world and even more nations. The world is open now and at your work, during your business trips and studies or just through the Internet you can be involved in the multicultural communication. Someone thinks that for efficient conversation good communicational skills and language proficiency (usually, in English) are enough. However, it's not easy. Knowi. A tradition is a belief or behavior (folk custom) passed down within a group or society with symbolic meaning or special significance with origins in the past. A component of folklore, common examples include holidays or impractical but socially meaningful clothes (like lawyers' wigs or military officers' spurs), but the idea has also been applied to social norms such as greetings. Traditions can persist and evolve for thousands of years—the word tradition itself derives from the Latin tradere