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Weaving Identity Death: SPINDLE WHORLS IN SAN PEDRO DE ATACAMA

Grace Eriksen

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Grace Eriksen

University of California, Merced

School of Social Sciences, Humanities, and Arts

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Abstract

Sex and gender are complex components of both individual and group identities, and examining them together with other aspects of identity is an important part of understanding larger social contexts. Historically, studies of sex and gender in society focused more on male roles and contributions, but recent research has become more inclusive and diverse in the examination of both female and nonconforming gender roles. This study examines the intersectionality of social roles, sex, and gender as expressed through funerary objects in the burial contexts of San Pedro de Atacama, Chile. Using existing records of burials in two cemeteries, Coyo Oriental and Solcor 3, this project compares 184 sampled graves to determine similarities and differences in burials for male and female individuals. Results show that some burials may reflect gendered practices, though the degree to which these practices are associated with sex differs between the two cemeteries, suggesting that regional culture plays a role in the social construction and expression of gender.

Keywords: sex, gender roles, culture, Chile, burials, identity

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Identity, even in its most minimal sense, is vital to our understanding not only of the self, but of the collective. In the social sciences, the term “identity” often refers to an inherent quality that all people, as individuals and as groups, possess. These identities, of a single person and of the group(s) they belong to, are socially constructed, with meanings created both by the individual and their perception of the self or the group, and by the society in which the individual or the group exists. They can be conscious and deliberate, or nonconscious and inadvertent, with both positive and negative social impacts (Brubaker & Cooper, 2000; Burke & Stets, 2009). Individual and group identities are multifaceted constructs, influenced and created by the intersection of society, biology, and the environment, but also by each other (Mac Sweeney, 2009; Torres et al., 2022). Individual identities cannot exist without group identities, and vice versa: the identity of the individual is often defined in terms of the self in relation or opposition to the whole while the identity of the group relies on the shared and collective identities of the individuals within it (Fowler, 2004; Mac Sweeney, 2009; Salazar et al., 2014).

This paper explores identity through a bioarchaeological lens that brings together skeletal studies with mortuary evidence of textile production at two cemeteries from pre-Columbian Chile. While weaving is undeniably important when it comes to early Andean cultures, few studies discuss the significance of weaving and weaving tools as markers of identity in burials. When weaving and textiles are discussed regarding identity, it is usually in terms of patterns, style, weave, and for the period focused on here, Tiwanaku influence as a marker of social status or trade (Baitzel & Goldstein, 2018; Oakland, 1992; Torres-Rouff & Knudson, 2017). Surprisingly, given the importance of such items, the inclusion of weaving tools themselves (such as spindle whorls) in graves are rarely considered in full. Few studies, with the exception

of Vogel et al. (2016) in their study of El Purgatorio, Peru, attempt to address the links between spindle whorls and their wider social contexts. As such, this study examines the potential symbolic, ritual, and social reasons for the inclusion of spindle whorls in burials in the Middle Period (AD 400-1000) San Pedro de Atacama cemeteries of Coyo Oriental and Solcor 3.

Identity in Anthropology

The intersectionality of identity (Davis, 2008), when applied to studies of living populations, allows anthropologists to create in-depth analyses of sociocultural groups around the world. When it comes to studies of past populations, however, archaeologists are limited in the information they can access. In many cases, the data used to build interpretations of past populations and their various identities is derived from mortuary contexts. In such cases, our understanding of the expression of individual identities is inherently biased, as the dead themselves have varied influence over how their survivors choose to bury them (Fahlander, 2012). However, the combination of intersectionality and personhood theories, ethnohistoric data, and the study of the materials together with the skeletal remains included in graves, bioarchaeologists can work to create interpretations of identity and personhood that provide a more nuanced view on identity in prehistory (Boutin, 2016; Conkey & Spector, 1984; Crandall & Martin, 2014; Geller, 2017; Sørensen, 2000).

The work presented here focuses on gender identity and the social identities that form part of the labor of textile production through spinning and weaving. Sex and gender are two of many contributing factors in the development of identity. Like identity itself, expressions and constructions of sex and gender are influenced by biological, social, and environmental factors. Following theories of intersectionality, all aspects of identity, such as sex, gender, race, class, profession, etc., influence and construct each other, and cannot be fully understood in isolation

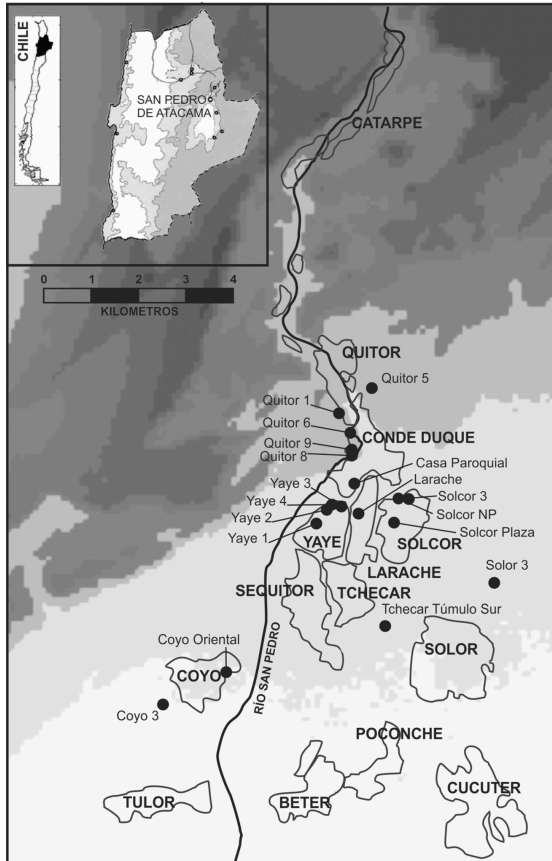
(Davis, 2008; Fahlander, 2012; Joyce, 2017). The concepts of sex and gender themselves are no exception to this intersectionality: the common definitions of gender rely directly on definitions of sex, and definitions of sex themselves are inherently based in gendered ideologies. Often, gender is portrayed as the cultural interpretation of sex, in accordance with or regardless of biological characteristics while sex is defined as biological and physical attributes that define someone as “male” or “female” in gender (Butler, 1999; Schudson & Morgenroth, 2022; Thorne, et al.).

Another important factor in identity examined in this case study is that of weaving, which is, in itself, a multifaceted reflection of both the individual weaver and the group to which they belong. In the Andes, weaving has been an important part of life and identity for thousands of years, with the oldest recorded instance of woven textile dating back to roughly 8000 BCE (Jolie et al. 2011). Archaeological and historic records outline a long tradition of weaving and textile production, not only as a trade, but as a deeply symbolic and integrated aspect of culture and identity (Graubart, 2000; Oakland, 1992; Plunger, 2009; Salazar et al., 2014; Sepúlveda et al., 2021). Additionally, ethnographic records of contemporary Latin American weavers demonstrate the continued importance of weaving as a component of culture and identity today (Berlo et al. 1996; Arnold 2018).

Background

Figure 1

Map of the San Pedro de Atacama ayllus



Note. (Torres et al. 2022)

The San Pedro de Atacama region (SPA) consists of a series of 13 interconnected oases, located in the Atacama desert of northern Chile (Salazar et al., 2014). These are considered ayllus by the present day community, a term that has spatial connotations as well as recognition of kin-based social units that comprise the unique community structures associated with geography, sociopolitical groups, and lineage (Abercrombie, 1998; Knudson & Torres-Rouff, 2014; Stovel, 2013). SPA's ayllus have been the focus of multiple studies of identity in the last three decades that bring together studies of material culture and human skeletal remains (Knudson & Torres-Rouff, 2014; Marsteller et al., 2011; Nado et al., 2012; Oakland, 1992;

Salazar et al., 2014; Stovel, 2013; Torres et al., 2022; Torres-Rouff & Knudson, 2017). When taken together, these studies build a strong foundation for understanding identity at individual, local, and interregional levels.

Though human occupation of the SPA region spans over 10,000 years, permanent settlements did not appear until the Late Formative Period (100-400 CE), which is a time characterized by small-scale agriculture and camelid herding (Pestle et al., 2021; Salazar et al., 2014). Over time, these populations grew, expanded, and became more complex. The subsequent Middle Period (600-1000 CE) is associated with prosperity, interregional interaction, growing social complexity, and an increased presence of Tiwanaku-style artifacts in the ayllus (Knudson & Torres-Rouff, 2014; Pestle et al., 2021; Rivera, 2008). For the ayllus, growing social complexity also meant increases in social inequality evidenced through the wealth of individual grave goods and emergent patterns of violence observed throughout the cemeteries of the SPA (Hubbe et al., 2012; Nado et al., 2012; Torres-Rouff, 2011; Torres-Rouff et al., 2018).

Materials and Methods

This study focuses on people interred at two Middle Period cemeteries, Solcor 3 and Coyo Oriental. Solcor 3, a smaller cemetery located roughly 2 kilometers east of the San Pedro River, appears to be a wealthier cemetery with higher degrees of social inequality. The Solcor ayllu is part of the main cluster of SPA ayllus, though it is farther from the river than the Yaye and Larache ayllus (Hubbe et al., 2012; Nado et al., 2012; Torres-Rouff, 2011). Located roughly 5 kilometers southwest of Solcor 3, on the western side of the San Pedro River, Coyo Oriental is noted as an affluent cemetery associated with mining and high rates of interpersonal violence. The Coyo ayllu is separated from the main cluster of ayllus, not just by the river, but also by a

small expanse of desert, leaving it somewhat isolated from the core (Salazar et al., 2014; Torres-Rouff, 2011; Torres-Rouff & King, 2014; Torres-Rouff et al., 2018).

The individuals selected for this study were based on the availability of mortuary context data in the notes of Father Gustavo Le Paige, housed at the Instituto de Arqueología y Antropología, and demographic and paleopathological data compiled by previous researchers (Nado et al., 2012; Torres et al., 2022; Torres-Rouff, 2011; Torres-Rouff et al., 2018). While remains from Solcor 3 were excavated in the 1980s following scientific protocols by archaeologists on staff at the Instituto de Arqueología y Antropología (formerly Instituto de Investigaciones Arqueológicas) of the Universidad Católica del Norte, Chile, the remains from Coyo Oriental were excavated by Father Gustavo Le Paige during the mid-twentieth century and skeletal remains in these cases are limited to crania. For this study, only adult individuals where sex could be determined, information as to grave context was available, and paleopathological data had been collected were studied, resulting in a total sample of 184 individuals (114 from Coyo Oriental and 70 from Solcor 3).

Figure 2

Table of sampled individuals from both sites.

Site	Females	Males	Totals
Coyo Oriental	52	62	114
Solcor 3	32	38	70
Totals	84	100	184

Standard bioarchaeological methods (Buikstra & Ubelaker, 1994; Buzon et al., 2005) were employed to determine age and sex, and analyze evidence of traumatic injury (Nado et al., 2012; Torres et al., 2022; Torres-Rouff, 2011; Torres-Rouff et al., 2018). Since the Coyo Oriental

sample consists of only crania, sexually dimorphic features of the skull were used to determine individual sex, while individuals were sexed using features of the os coxae whenever they were available at Solcor 3.

In addition to analyses of pathology and sex, chi-squared tests of independence were conducted in order to determine whether certain funerary objects included in burials have a significant association with sex, trauma, age, or other funerary objects. In order to contextualize the occurrence of spindle whorls as funerary objects associated with identity, the inclusion of spindle whorls in graves was analyzed alongside the inclusion of other items, and the frequencies of such items together were taken into consideration as a whole alongside markers of age, sex, and trauma.

Results

Figure 3

Table of Chi-Squared Results.

Site	Variables Compared	Chi-Squared Result	Significant? ($\alpha = 0.05$)
Solcor 3	Snuff Paraphernalia and Sex	df = 1; $\chi^2 = 10.192$	Yes
Coyo Oriental	Snuff Paraphernalia and Sex	df = 1; $\chi^2 = 28.005$	Yes
Solcor 3	Bows and Sex	df = 1; $\chi^2 = 14.47$	Yes
Coyo Oriental	Bows and Sex	df = 1; $\chi^2 = 11.049$	Yes
Solcor 3	Spindle Whorls and Sex	df = 1; $\chi^2 = 6.461$	Yes
Coyo Oriental	Spindle Whorls and Sex	df = 1; $\chi^2 = 2.661$	No
Solcor 3	Cranial Trauma and Sex	df = 1; $\chi^2 = 0.095$	No
Coyo Oriental	Cranial Trauma and Sex	df = 1; $\chi^2 = 0.061$	No
Solcor 3	Cranial Trauma and Spindle Whorls	df = 1; $\chi^2 = 0.065$	No

Coyo Oriental	Cranial Trauma and Spindle Whorls	df = 1; $\chi^2 = 0.946$	No
Solcor 3	Cranial Trauma and Snuff Paraphernalia	df = 1; $\chi^2 = 0.929$	No
Coyo Oriental	Cranial Trauma and Snuff Paraphernalia	df = 1; $\chi^2 = 0.915$	No
Solcor 3	Cranial Trauma and Bows	df = 1; $\chi^2 = 0.048$	No
Coyo Oriental	Cranial Trauma and Bows	df = 1; $\chi^2 = 0.072$	No
Solcor 3	Snuff Paraphernalia and Spindle Whorls	df = 1; $\chi^2 = 2.625$	No
Coyo Oriental	Snuff Paraphernalia and Spindle Whorls	df = 1; $\chi^2 = 0.200$	No
Solcor 3	Bows and Spindle Whorls	df = 1; $\chi^2 = 8.279$	Yes
Coyo Oriental	Bows and Spindle Whorls	df = 1; $\chi^2 = 0.089$	No
Solcor 3	Age and Spindle Whorls	df = 2; $\chi^2 = 3.109$	No
Coyo Oriental	Age and Spindle Whorls	df = 2; $\chi^2 = 0.018$	No
Solcor 3	Age and Snuff Paraphernalia	df = 2; $\chi^2 = 2.206$	No
Coyo Oriental	Age and Snuff Paraphernalia	df = 2; $\chi^2 = 4.201$	No

Figure 4

Distribution of funerary objects related to sex.

	Solcor 3		Coyo Oriental	
	Absolute Frequency	Percentage	Absolute Frequency	Percentage
Females Buried with Snuff Paraphernalia	8 of 32	25%	8 of 52	15%
Males Buried with Snuff Paraphernalia	24 of 38	63%	40 of 62	64%
Total Buried with Snuff	32 of 70	46%	48 of 114	42%

Paraphernalia				
Females Buried with Bows	9 of 32	28%	9 of 52	17%
Males Buried With Bows	28 of 38	74%	29 of 62	47%
Total Buried with Bows	37 of 70	53%	38 of 114	33%
Females Buried with Spindle Whorls	16 of 32	50%	18 of 52	35%
Males Buried with Spindle Whorls	8 of 38	21%	13 of 62	21%
Total Buried with Spindle Whorls	24 of 70	34%	31 of 114	27%

The use of hallucinogenic snuff powder has been linked to the ritual sphere in the San Pedro de Atacama region (Niemeyer et al., 2015; Torres et al., 1991), and some authors have hypothesized that ritual roles tied to snuffing were mainly the roles of biological males, or possibly individuals gendered as men (Torres-Rouff & Knudson, 2017). In both Solcor 3 and Coyo Oriental, the association between snuff paraphernalia (trays, tubes, and leather pouches) and male burials is statistically significant (Figure 3). Of the 32 females buried in Solcor 3, only 25% are buried with snuff paraphernalia, while 63% of males in Solcor 3 are buried with the same items. The pattern in Coyo Oriental is similar: 15% of females and 64% of males are buried with snuff paraphernalia (Figure 4). In addition to snuff paraphernalia, the association between bows and male burials is also statistically significant for both sites (Figure 3). The distribution of bows for female burials is similar to that of snuff paraphernalia, with 28% of females in Solcor 3 and 17% of females in Coyo Oriental being buried with bows (Figure 4). These findings corroborate the previous findings of Torres-Rouff and Knudson (2017).

Neither cemetery displays a significant association between cranial trauma and sex, or cranial trauma and any particular burial items (Figure 3). The lack of statistical significance of

trauma in association with sex corroborates the findings of Torres-Rouff et al. (2018). The associations between age and spindle whorls, as well as age and snuff paraphernalia, were also determined to be of no statistical significance (Figure 3).

Figure 5

Table comparing possession of bows and spindle whorls in relation to sex.

Site		Buried With Bows Only	Buried with Bows and Spindle Whorls	Buried with Spindle Whorls Only	Buried with Neither Item	Total Individuals
Solcor 3	Females	2	7	9	14	32
	Males	20	8	0	10	38
Coyo Oriental	Females	7	2	16	27	52
	Males	20	9	4	29	62

Interestingly, the association between spindle whorls and female burials is statistically significant in Solcor 3, but not in Coyo Oriental (Figure 3). In Solcor 3, 21% of males and 50% of females are buried with spindle whorls (Figure 4). Of particular intrigue is that this relationship appears to be the inverse of that between snuff paraphernalia and biological sex, at least in Solcor 3. This pattern is also reflected in the association of bows and spindle whorls: the relationship is statistically significant in Solcor 3, but not Coyo Oriental (Figure 3). Of the Solcor 3 sample, every single male buried with a spindle whorl is also buried with a bow, and 77% (7 out of 9) of females buried with bows are also buried with spindle whorls (Figure 5). The overall percentage of people buried with spindle whorls in both cemeteries is similar, with spindle whorls observed in 34% of the Solcor 3 graves and 27% of the Coyo Oriental graves (Figure 4).

Discussion

While previous studies have established the relationship between the snuff complex and male individuals (Torres-Rouff & Knudson, 2017), the potential association between spindle whorls and female individuals has not been investigated to such an extent. Since spindle whorls and weaving tools are found in Andean burials beyond the San Pedro de Atacama region (Vogel et al., 2016), they likely played a significant role in the social construction of identity, both in life and in death. While the reasons for including these items in burials remain known only to those who buried the dead in Solcor 3 and Coyo Oriental, there are several likely interpretations for this phenomenon. These items may have been included in graves because they either accompanied the dead in life, had some sort of religious or ritual meaning, or were a symbolic marker of gender.

Spinning and weaving played an important role in local Andean economies and expressions of identity (Baitzel & Goldstein, 2018; Vogel et al., 2016). Textile and spindle whorl iconographies have been linked to specific regions, such as Tiwanaku in southern Peru and various other locations (Baitzel & Goldstein, 2018; Edwards et al., 2008; Sepúlveda et al., 2021). If spinning and weaving were such an important part of local and regional cultures, the spinners and weavers, who were instrumental in creating textiles, also played an important role in constructing local identity. Their work and designs contributed to the construction and expression of group identities, such as those linked to the Tiwanaku provinces (Baitzel & Goldstein, 2018; Nado et al., 2012; Oakland, 1992). As producers of items that reflected the identities of their groups as a whole, the position of being a weaver was also an important component of identity for the weavers, both as a group and as individuals. It follows, therefore, that the tools these weavers used in life, such as spindle whorls, would accompany them in death.

It is also possible that the inclusion of spindle whorls in graves was due to symbolic or ritual associations with the objects. This may account for the presence of spindle whorls in the graves of children too young to spin (Vogel et al., 2016), and it also accounts for the possibility that individuals buried with spindle whorls may not have all been spinners or weavers. Some contemporary ethnographic studies of Andean weaving communities reveal beliefs that textiles are like living beings, and that the processes associated with creating textiles are associated with the life cycle (Arnold, 2018). While modern cultures are reflective of modern, postcolonial contexts and not necessarily of archaeological cultures, it is possible that similar beliefs played a role in the placing of spindle whorls in graves. If this interpretation is the case, then the inclusion of spindle whorls as ritual objects reflects the importance of weaving as an aspect of local culture and identity—not only were these objects important for material value and culture, but they were also important symbolic markers in death.

A third possible reason for spindle whorls in burials is that such items were social markers of gender identity, or that, because spinning and weaving were often gendered practices (Baitzel & Goldstein, 2018; Vogel et al., 2016), these items reflect the division of labor regarding spinners and weavers. If spinning and weaving were primarily the work of females, or people gendered as female, then those buried with spindle whorls may indicate a gendered division of labor. If spindle whorls were indicative of female gender, then this may also account for the inclusion of spindle whorls in the graves of children too young to spin. However, it is also possible that spindle whorls in the graves of children marked those children as apprentices or the offspring of weavers.

Additionally, the presence of spindle whorls in the graves of biological males, as well as the presence of snuff paraphernalia and/or bows in the graves of biological females, could

indicate that these individuals had identities distinct from the traditional male or female binary. The idea of gender as a rigid binary between male and female is a largely Westernized concept, and it is therefore inappropriate to apply such a binary to archaeological contexts without acknowledging the potential for conceptualizations of gender that do not fit Western frameworks (Geller, 2017; Gontijo et al., 2021). Ethnohistoric evidence shows that Indigenous groups in North and Latin America experience constructions of gender that do not fit this Western binary system (Gontijo et al., 2021; Herdt, 1994), so it must therefore be considered here. Following this evidence, it is possible that individuals buried with potentially gendered items, such as spindle whorls, bows, and snuff paraphernalia, represented people who filled both feminine and masculine roles in their social groups.

With these interpretations in mind, the results of funerary object analysis for Coyo Oriental and Solcor 3 present some interesting differences. While burials in Solcor 3 show a clear and significant association between biological females and spindle whorls, this is not the case for Coyo Oriental. Differences in geographic location, resource availability, and local social structures influenced the ways in which the people of these *ayllus* maintained and expressed identity, both in life and in death.

Solcor 3 has been interpreted as a wealthier cemetery with higher degrees of social inequality, while Coyo Oriental has been interpreted as an affluent cemetery with an unusually high rate of violence (Hubbe et al., 2012; Torres-Rouff, 2011; Torres-Rouff et al., 2018). Solcor 3 demonstrates a strong division between burials interpreted as elite and non-elite individuals (Hubbe et al., 2012; Nado et al., 2012), and the results of this project's analyses indicate that such strong social divisions may have also extended to the divisions of labor and/or gender roles within the *ayllu*. It is possible that the role of spinning and weaving was more restricted to

individuals with a certain social status in Solcor 3 than in Coyo Oriental, and that the art of weaving was more accessible to different groups in Coyo Oriental. It is also possible that this role was more strongly associated with females or people gendered as female in Solcor 3, and that the people who lived in Coyo Oriental had a less strictly gendered division of weavers and non-weavers.

The similar percentages of graves with spindle whorls in Solcor 3 and Coyo Oriental supports the possibility that the individuals buried with these items represent portions of the populations that were weavers. If these individuals were weavers, the different significances of biological sex in association with spindle whorls between the cemeteries might indicate distinctive divisions of labor. In this case, weaving at Solcor 3 may have been a role traditionally filled by biological females, or perhaps, people gendered as female, while weaving at Coyo Oriental was equally accessible to biological males, biological females, and possibly, people who represented alternative gender roles.

Alternatively, the inclusion of spindle whorls in burials in both cemeteries could be indicative of symbolic meaning for the objects, rather than strictly indicative of the individual's occupation. This interpretation could exist in parallel with interpretations of spindle whorls as belonging to weavers, as the items could be used symbolically in burials of non-weavers while also being included in the graves of weavers. However, given that the percentages of spindle whorls in both sites are fairly low (Figure 4), it is less likely that these items would be used as symbolic funerary objects, and more likely that they were tools or personal items belonging to the individuals buried with them.

If the inclusion of spindle whorls in Solcor 3 was a marker of gender identity, or if being a weaver was a gendered position, then it is interesting how spindle whorls appear in association

with bows in burial contexts. While both cemeteries have a statistically significant association between bows and biological males, only Solcor 3 has an association between bows and spindle whorls. In Solcor 3, every single male buried with a spindle whorl is also buried with a bow, while nearly every female buried with a bow is also buried with a spindle whorl (Figure 5). If these objects indicate gender or gendered roles, then this could suggest that the individuals buried with both items may have filled both feminine and masculine roles, or that their identities existed outside contemporary, Western notions of a gender binary system.

Since other items, such as bows and snuff paraphernalia, are associated with biological sex in Coyo Oriental, the lack of association between spindle whorls and sex, as well as spindle whorls and bows, is a telling distinction for Coyo Oriental. While these items are associated with sex in Solcor 3, the lack of significant association in Coyo Oriental indicates that the people of these *ayllus* constructed and designated the identities of weavers differently. One possibility is that weaving for the people of Coyo Oriental was not a strictly feminine or masculine role, and that being a weaver was accessible to both biological females and males, while in Solcor 3, this role was more strictly feminine. Given the lack of significance for spindle whorls and sex, as well as spindle whorls and bows, it is also possible that notions of gender roles and structures within Coyo Oriental were generally less rigid than those in Solcor 3.

Conclusion

It may never be exactly clear why the people of the SPA *ayllus* or other parts of the Andes buried their dead with certain objects, or what the social significance of those objects were. However, that does not mean that studies of those objects should be limited to only objective observations and typologies, or that they should be discarded from analysis entirely. Funerary objects such as spindle whorls are reflective of the ways in which the individual's

identity was constructed by the people who buried them, of the ways in which those objects were valued by the group, and of the group's social makeup and hierarchies themselves. By examining the intersections of biological sex, age, trauma, and funerary objects such as spindle whorls, archaeologists can highlight different constructions and expressions of identity in death.

Overall, the examination of spindle whorls alongside biological markers and other funerary objects provides insight into the cultural variation that existed within the San Pedro de Atacama *ayllus*, but there is still more work that can be done. This paper focuses on the intersectionality of biological sex and funerary contexts, but the relationship between spindle whorls and individual identity can be further examined. While the skeletal data for many of these individuals are limited to only crania, those with more complete skeletons should be examined for biological markers related to weaving, such as osteoarthritis of certain joints. The results of these examinations could shed further insight into whether the individuals buried with spindle whorls were weavers themselves. Additionally, graves of children buried with spindle whorls should also be taken into account and examined in greater detail, especially since this aspect was not discussed in detail within this paper.

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