

Andean Social Identities:  
Analyses of Community, Gender, and Age Identities at Chiribaya Alta, Peru

by

Emily Ann Schach

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Graduate Supervisory Committee:

Jane E. Buikstra, Chair  
Kelly J. Knudson  
Pamela L. Geller

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## ABSTRACT

Social identities are fundamental to the way individuals and groups define themselves. Archaeological approaches to social identities in the Andes emphasize the importance of group identities such as ethnicity and community identity, but studies of gender and age identities are still uncommon. In this dissertation, I build on these earlier approaches to Andean social identities and consider community, gender, and age identities at the site of Chiribaya Alta using case studies.

The coastal Ilo Chiribaya polity is associated with the Andean Late Intermediate Period in the lower Osmore drainage of southern Peru. Previous analyses indicate that Chiribaya sites in this area formed a *señorío*, an Andean chiefdom with separate occupational groups of fishers and farmers. The most complex excavated Chiribaya site in this region is Chiribaya Alta. At this time, excavations have sampled nine of the cemeteries present at the site. Two of these cemeteries, four and seven, have the most elaborate burials at the site and are each associated with different occupational communities.

This dissertation examines community, gender, and age identities at Chiribaya Alta through the use of three case studies. The first case study argues that the iconographic designs on coca bags interred with the dead signified occupational community identities. Coca bags buried in cemetery four have designs relating to mountains and farming, whereas those from cemetery seven have symbols associated with water. These designs correspond to the occupational community groups associated with each of these cemeteries. The second case study uses grave good presence and absence to examine the nature of gender roles and identity at Chiribaya Alta. Multiple correspondence analysis indicates that normative gender roles are reflected in grave good

assemblages, but that gender identity was flexible at the individual level. The final case study presents newly generated age-at-death estimations using transition analysis combined with mortuary analyses to explore the manner in which gender and age intersect for older individuals at Chiribaya Alta. This final paper argues that there is an elderly identity present amongst individuals at Chiribaya Alta and that gender and age intersect to impact the lives of older men and women differently.

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# CHAPTER 1

## INTRODUCTON

Social identities play an important role in how individuals define themselves as members of social groupings. The importance of social identities has become critically apparent in modern discourses, as seen through pushes for diversity and the emergence of identity politics. Social identities, such as community, gender, and age identities, were also important to people in the archaeological past, as seen through the emergence and florescence of identity studies in archaeological contexts (e.g., Appleby 2010; Back Danielsson and Thedéen 2012; Baitzel and Goldstein 2014; Cave and Oxenham 2017; Chesson 1999; Clayton 2010; Conkey and Spector 1984; Costin 1998; Geller 2009, 2017; Gowland 2006; Halcrow and Tayles 2008; Joyce 2000; Knudson and Stojanowski 2009; Meskell 1999; Rega 2000; Sharratt 2011; Sofaer Derevenski 1997; Stockett 2005; Yaeger and Canuto 2000).

The central Andes are an ideal location for the study of prehistoric social identities due to the excellent preservation of perishable materials and the availability of ethnographic studies. Andean archaeologists are usually most interested in ethnic and community social identities (e.g., Blom 2005; Cassman 2000; Goldstein 2000, 2015; Knudson 2008; Knudson and Blom 2009; Nystrom 2009; Reycraft 2005a; Torres-Rouff 2009). Work on other social identities are limited, with notable exceptions involving gender (Bray 2003; Gero 1992; Hastorf 1991; Silverblatt 1987; Somerville et al. 2015), age (Baitzel and Goldstein 2014; Tung and Knudson 2010), and intersectional social identities (Torres-Rouff and Knudson 2017).

Studies of Chiribaya social identities follow the above trend, with numerous studies addressing ethnic and community identities (Buikstra et al. 2005; Dzedzic 2016;

Lozada 2011; Lozada and Buikstra 2002, 2005; Reycraft 2005b; Sutter 2009; Tomczak 2003) but relatively few discussing other dimensions of social identity (Buikstra 1995; Lozada and Rakita 2013). Building these previous Chiribaya studies, this dissertation uses three case studies addressing social identities at the Late Intermediate site of Chiribaya Alta in southern Peru. Broadly, these case studies all address different dimensions of social identity. The first discusses community identity, the second analyzes gender identity, and the third uses an intersectional approach to gender and age identities for elderly individuals. These case studies are meant to illustrate the ways in which social identities are signified in the Chiribaya burial environment and impact the lived experiences of individuals.

### **Social identities: Community, Gender, and Age.**

This dissertation is concerned with social identities at Chiribaya Alta. Here, I will briefly introduce each of these social identities. Each dimension of social identity is discussed in more depth within the case study chapters.

Community identity is a form of group identity, which operates to create a collective sense of ‘us,’ and thus cannot exist among lone individuals (Cohen 1985; MacSweeney 2009). In the Andes, community group identities take the form of *ayllus*, which are collective memberships that can exist on multiple scales (Allen 1981; Bastien 1978; Goldstein 2000; Weismantel 2006). Critically, *ayllu* membership includes affiliations to places on the landscape and therefore, is important to the case study presented in chapter 2, as the Ilo Chiribaya were organized into communities of occupational specialists with different relationships to the natural landscape.

Gender identity is the manner in which cultures understand sexual difference (Gilchrist 1999). It is a social identity build upon human phenotypic sexual difference,

but it is not equivalent to sex, rather it relates to the cultural expectations placed upon individuals of each sex. Thus, gender appears natural to individuals within their cultural context, but gendered expectations and experiences are variable across space and time (e.g. Brumfiel 2006; Buikstra and Scott 2009; Conkey and Spector 1984; Geller 2009b; Gero and Scattolin 2002; Gilchrist 1999). Archaeological approaches to gender have used a variety of methods and contexts, including households (Allison 2015; Gero and Scattolin 2002; Hastorf 1991; Hendon 1996, 1997), iconography (Alberti 2005; Hubert 2016; Joyce 1993; Mandell 2015; Peled 2016), mortuary contexts (Arnold 1991, 2002; Bacus 2007; Clayton 2010; Hamlin 2001; Knüsel and Ripley 2000; Marcus 1993; Sofaer Derevenski 1997, 2002), and bioarchaeology (Bentley et al. 2007; Geller 2017; White 2005).

Age identities relate to the expectations and experiences associated with times during the human life course (Appleby 2011; Kaufman and Elder 2002). As such, age identity is the individual's experience of their social age category, which is expected to shift as a person progresses through the life course, i.e. ages (Appleby 2011; Sofaer 2011:290; Welinder 2001). Archaeological studies of age identity usually focus on children or the entire life course (e.g., Ardren and Hudson 2006; Baitzel and Goldstein 2014; Baxter 2005; Bugarin 2005; Ceruti 2010; Gilchrist 2004, 2011, 2012; Gowland 2006; Halcrow and Tayles 2008; Harlow and Laurence 2002; Joyce 2000; Kamp 2001; Lillie 1997; Moore 2009; Robb 2002; Sofaer Derevenski 1997, 2000). The case study presented in chapter 4 is concerned with the elderly, a social age category that has not been the major focus of archaeological studies with some notable exceptions (Appleby 2010, 2011; Cave and Oxenham 2016; Fahlander 2013; Gowland 2016; Welinder 2001).

## The Ilo Chiribaya *señorío* of the south-central Andes

The Ilo Chiribaya polity is a complex chiefdom centered on the lower Osmore drainage of southern Peru near the modern city of Ilo (Buikstra 1995). This group largely dates to the Late Intermediate Period, although there are some earlier radiocarbon dates suggesting that this group first emerged during the terminal Middle Horizon (Buikstra 1995; Buikstra et al. 1997, 2005). There appear to have been multiple Chiribaya-affiliated chiefdoms along the southern coast of Peru and northern Chile, as Chiribaya style ceramics have been found in areas stretching from Arequipa in the north to Azapa, Chile in the south (Buikstra 1995; Focacci 1990; Jessup 1991; Kolomanski 2016; Muñoz Ovalle and Focacci A. 1985). Excavations have been conducted at multiple locales, but the best studied Chiribaya chiefdoms are located in Azapa, Chile and Ilo, Peru (Buikstra 1995; Jessup 1991; Focacci 1990; Muñoz Ovalle and Focacci A. 1985). Here, I focus our discussion on the Ilo Chiribaya.

Archaeological and bioarchaeological studies suggest that Ilo Chiribaya political economy resembled that of a *señorío*, which is an Andean chiefdom consisting of multiple occupational communities (Buikstra et al. 2005; Lozada 2011; Lozada and Buikstra 2005; Tomczak 2003). *Señoríos* are described by Rostworowski (1970, 1977, 1989), who used ethnohistoric texts to study the organization of proto-historic coastal Andean chiefdoms. They consist of multiple endogamous communities that had economic specializations.

The Ilo Chiribaya *señorío* was a loosely organized polity of at least two occupationally specialized groups (Buikstra et al. 2005; Lozada and Buikstra 2005). The first group, *pescadores* or fishers, relied on the collection of maritime resources. The second group, *labradores*, were agro-pastoralists responsible for farming and camelid

herding. The presence of these two groups is supported by site locations, ceramic styles, cranial modification styles, and dietary differences between sites associated with *labradores* and *pescadores* (Buikstra et al. 2005; Lozada 2011; Lozada and Buikstra 2002, 2005; Tomczak 2003).

### ***Chiribaya Alta***

All of the case studies presented in this dissertation take place using the mortuary remains from Chiribaya Alta. This site is an excellent location for the study of prehistoric social identities in the Andes. The hyper-arid climate of the Peruvian coast results in well-preserved human remains and mortuary artifacts, including textiles and wooden objects. The presence of both Chiribaya occupational communities and elaborate mortuary ritual allows for in-depth studies of social identities using these materials.

Chiribaya Alta is the largest and most complex Chiribaya site excavated to date in the Osmore drainage. It is a multi-component site with evidence of domestic structures, agricultural terracing, a wall and moat system, as well as extensive mortuary sections. Thus far, excavations at the site have targeted nine spatially discrete cemeteries. Of these, cemeteries 1, 2, 4, and 7 have the largest number of excavated tombs. Cemeteries 4 and 7 contain tombs with the greatest number and most elaborate of grave goods. These two cemeteries also are each associated with different occupational communities within the Chiribaya polity—cemetery 4 is associated with *pescadores* and cemetery 7 is associated with *labradores*.

The location of Chiribaya Alta, overlooking the narrow lower Osmore valley on the *pampa*, makes it well suited for agro-pastoral activities. It is also only 7 km from the Pacific coast and is thus a location facilitating access to maritime resources. It does appear that both *labradores* and *pescadores* were interred in the cemeteries at Chiribaya



Alta, suggesting that it was an important location for both occupational communities within the Chiribaya *señorío*.

Previous analyses of social identities at Chiribaya Alta have largely addressed differences between *labradores* and *pescadores*, where we see differences in the mortuary goods and lived experiences of individuals from each group (Buikstra et al. 2005; Lozada 2011; Lozada and Buikstra 2002, 2005; Tomczak 2003). *Labradores* are associated with greater terrestrial resource consumption, modified crania in the fronto-occipital style, Yaral style ceramics, and burial with camelid remains. In contrast, *pescadores* have greater marine consumption, annular cranial modification, and the presence of San Geronimo style ceramics in their graves. Lozada and Rakita (2013), used mortuary analysis at Chiribaya to address aspects of gender and age identity. Their analysis reveals that children under 5 years old are often buried in urns, which may have served as symbolic wombs (Lozada and Rakita 2013:118). In terms of gender identities, male burials were associated with *keros* and musical instruments and female burials with weaving tools (Lozada and Rakita 2013:119).

### **Structure of the dissertation**

This dissertation uses three case studies to understand social identities within the Ilo Chiribaya polity. Each of these is focused on a different form of social identity and uses different methods to explore the differentiation and role of social identities. Nevertheless, all of these cases use evidence from the mortuary remains at Chiribaya Alta to explore how these identities were signified amongst the dead.

The first case study is presented in Chapter 2 and concerns community identities at Chiribaya Alta as seen through iconography on *chuspas* (coca bags). In this case study, we argue that the iconography on textiles, which usually represent the natural and social

world, serve as material symbols of community identity at Chiribaya Alta. Analyses in this case study compare the coca bags from Chiribaya Alta cemeteries four and seven, which are associated with *pescadores* and *labradores* respectively, to understand how these two groups were signaling their community identity within the Ilo Chiribaya *señorio*. Results indicate that *chuspas* from Cemetery 4 have motifs relating to mountains and farming, whereas those from Cemetery 7 have symbols associated with water. Therefore, we argue that *chuspas* from these cemeteries indicate that these two *ayllus* used different iconographic motifs to signify their differential affiliations to landscapes and community.

Gender, rather than community, identity is the focus of the second case study. Chapter 3 of the dissertation presents a mortuary analysis using Multiple Correspondence Analysis to explore differences between expected gender roles and identities at Chiribaya Alta. This analysis builds on a previous univariate analysis of gender at Chiribaya Alta conducted by Lozada and Rakita (2013). Here, I propose that the use of multivariate techniques, in this case multiple correspondence analysis, avoids the imposition of Western gender binaries onto the archaeological past because it does not limit the analyzed sample to sexed burials. Instead, sex is used a supplementary variable to aid in the interpretation of the multivariate biplot. The results of the multivariate analysis indicate that males at Chiribaya Alta are associated with *keros*, *bolsas*, and musical instruments, while females are associated with *panuelos*, and weaving tools. This suggests that these objects reflect normative gender roles but there is considerable variation on the individual level in terms of grave goods. This variability suggests that gender identity was flexible at Chiribaya Alta on the individual level.

The final case study, presented in chapter 4, presents an intersectional approach to gender and age identities among the elderly buried at Chiribaya Alta. Methodological constraints have made the identification of older individuals buried at archaeological sites a challenge, as most traditional methods for estimating skeletal age-at-death have an open-ended range of 50+. In this case study, however, we employ transition analysis, which is able to estimate the ages of older individuals with greater accuracy. I employ this method to identify older individuals at Chiribaya Alta and use mortuary data to explore the ways in which gender and age intersect to impact the lived experiences of elderly individuals. These analyses reveal that older individuals do possess an elderly identity at Chiribaya Alta. Furthermore, male individuals increasingly signify their gender identities as they age through the accumulation of masculine grave goods, whereas female individuals gain access to masculine artifacts as they age. These results suggest that gender and age intersect to impact the lives of older men and women differently as they age.

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## CHAPTER 2

### CHUSPAS AND COMMUNITY IDENTITY AT CHIRIBAYA ALTA: AN ANALYSIS OF TEXTILE ICONOGRAPHY

Textiles in the modern Andes convey a symbolic language, where motifs have meaning rooted in the natural world (Heckman 2003; Silverman 2008). Modern Andean textiles are also strongly associated with place, as communities use particular styles and motifs to signify their identity (figure 1; Femenías 2005; Medlin 1986; Meisch 1985; Morales 2012). Thus, textile motifs can serve to represent important elements of the natural world, while doing so in a manner usually associated with an individual's *ayllu* (community) identity. *Chuspas*, or coca bags, are abundantly present at the Late Intermediate Period cemetery site of Chiribaya Alta. These brightly colored bags are decorated with iconographic figures and often still hold a coca offering, which was left with the dead during the funerary process. Here we argue that the motifs present on Chiribaya coca bags served important symbolic roles, (1) to represent features of the landscape to whom offerings were made during coca rituals and (2) to signify *ayllu* affiliation.

The ancient Ilo Chiribaya polity is an example of an Andean *señorio*. *Señorios* have been ethnographically described as representing communities of occupationally specialized, endogamous groups, each with a separate *ayllu* identity, a concept which I will explain more fully below (Rostworowski 1977, 1978, 1989). Similarly, bioarchaeological studies of the Chiribaya have suggested that an individual's community identity impacted their lived experiences in terms of diet (Tomczak 2003) and cranial modification (Lozada 2011; Lozada and Buikstra 2002). These identities were also expressed materially in the mortuary contexts through ceramic styles and design (Jessup



Figure 1. Map of locations cited as examples in text.

1991) and the presence of camelid remains in the graves of agriculturalists buried at Chiribaya Alta (Lozada et al. 2009). Therefore, community identity was an important factor in guiding the lived experiences of Chiribaya individuals.

Our goal is to explore the relationship between Chiribaya *chuspas* and occupational *ayllu* identity through a comparison of iconographic motifs at Chiribaya Alta Cemeteries 4 and 7. These cemeteries have been associated with distinctive occupational *ayllus* through analyses of diet and head-shaping (Lozada and Buikstra 2002; Lozada et al. 2009; Tomczak 2003). Since the iconographic motifs on bags are

visible symbols that would have signaled and reified the *ayllu* identity of the wearer through daily use, we assess the extent to which *ayllu* identity extends into coca ritual practices.

### **Andean Group Identities**

We are interested in the manifestation of group identities in daily coca chewing as seen through *chuspa* style. Here we will begin by broadly discussing group identities before presenting a discussion of Andean social structures. As such, we draw on the emic concept of *ayllu* to understand the interaction between identity and the sociopolitical structure of coastal Andean chiefdoms known as *señoríos*,

Group identities are those operating using a collective sense of ‘us’ and cannot exist among lone individuals (Cohen 1985; MacSweeney 2009). In archaeology, ethnicity is the most studied form of group identity (e.g. Jones 1997; Lucy 2005), but other group identities include religious, community, and occupational identities (Buikstra and Scott 2009; MacSweeney 2009; Yaeger and Canuto 2000). Definitions of group identities are variable, but here we adopt the modified interactionalist paradigm originally developed for community, where it is envisioned as, “an ever-emergent social institution that generates and is generated by supra-household interactions that are structured and synchronized by a set of places within a particular span of time” (Yaeger and Canuto 2000:5). Thus, community identity is created by individual agents and their relationships within and outside their social group and their place in the landscape. The interactionalist perspective applied to group identities more broadly works well for our purposes, because we are interested in the ways individuals were signaling their group identity and interacting with these symbols through daily coca practice.



Andean communities and groups are classified using the term *ayllu*. Bastien defines *ayllu* as, “distinguishable groups whose solidarity is formed by religious and territorial ties, by permanent claim to land and lineage, by affinal ties, and by work” (Bastien 1978:211). *Ayllus* are drawn from real and/or fictive kin occupying a particular territorial space on the landscape (Allen 1981; Bastien 1978; Goldstein 2000; Weismantel 2006). The term is multi-scalar and *ayllu* describes multiple levels of collective memberships, including occupational, residential, and modern ethnic groups. (Choque and Mamani 2001; Gifford and Hoggarth 1976; Goldstein 2000; Weismantel 2006). Members share allegiance to the same features of the landscape and make offerings to and materially symbolize this relationship with venerated local places (Allen 1981; Bastien 1978; Femenías 2005; Lozada 2011; Radcliffe 1990).

*Ayllu* membership is an important source of individual self-identification in the Andes and as such, it is manifested materially. For example, in the Colca Canyon of southern Peru there are two *ayllus*: the Collaguas and Cabanas. The women in each of these *ayllus* wear hats that differentiate themselves from each other while also mimicking the form of each group’s venerated mountain (Femenías 2005; Lozada 2011). Thus, in the Colca Canyon *ayllu* membership is visible to others in a way that can be explicitly tied to the landscape.

The Chiribaya polity lived in *señoríos*, which are coastal Andean polities identified from ethnohistoric records by Rostworowski (1977, 1978, 1989). *Señoríos* were lordships that consisted occupational specialists including fishermen, farmers, merchants, and artisans (Rostworowski 1977; 1978). In the coastal Chincha *señorío* on the Central Peruvian Coast a census recorded the presence of 10,000 fishermen, 12,000 farmers, and 6,000 merchants (Rostworowski 1970, 1977). Occupational groups existing

within *señoríos* are *ayllus*. Rostworowski describes ethnohistoric documents from the North coast of Peru where, “there existed *ayllus* whose members did a single type of work, excluding from their labors any other occupation” (1977:171). Archaeological evidence suggests these polities existed throughout the precontact coastal Andes, especially during the Late Intermediate Period (Marsteller et al. 2017; Lozada and Buikstra 2002; Marcus et al. 1999).

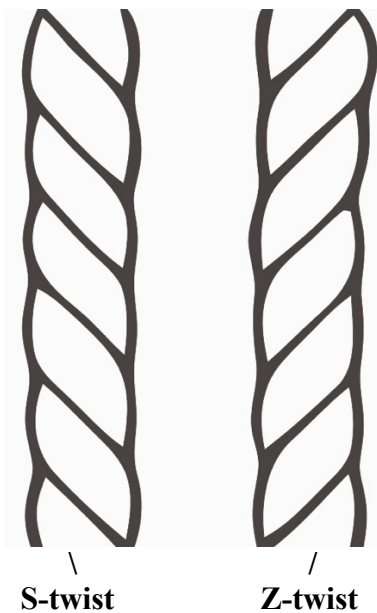
The occupational *ayllus* within *señoríos* were spatially segregated into separate domestic communities and had different affiliations to landscape features. For example, fishermen during the contact period lived in communities separate from farmers, trading salted fish for the other commodities they needed (Rostworowski 1977; 1997). They also worshiped separate gods related to the sea, exemplified by the offerings found on guano islands off the coast of South America (Benson 1995; Rostworowski 1977). Thus, fishermen were a part of *señoríos*, but lived separately and had different *ayllu* and landscape affiliations from their farming counterparts.

### **Weaving, Dress, and Identity in the Andes**

Weaving is an important task in the modern Andes and considerable time is devoted to the production of textiles (Franquemont 1986; Goodell 1969; Silverman 2008; Zorn 1992, 2004). A textile object is produced through a lengthy process, which requires the spinning, plying, and dyeing of yarns, the weaving of the textile pieces, and finishing steps, including sewing, embroidery, and other decorative finishes. To better understand the *chuspas* in Chiribaya tombs, we will briefly discuss the textile production processes in the modern Andes. These processes produce textile objects that signal and reify the social identities of the user, as seen from numerous ethnographic examples (e.g. Ackerman 1991; Femenías 2005; Heckman 2003; Medlin 1986; Meisch 1985; Morales

2012). Ethnographic works indicate that the iconography on textiles reflect aspects of the social and natural landscapes (Heckman 2003; Meisch 1985; Zorn 2004), and thus they can be used to identify groups and their relationship with the landscape.

Yarns are spun using either an S or Z spin, which reflects the direction the fibers are spun on the drop spindle (Goodell 1969; Splitstoser 2012). Clockwise spins are S and counter-clockwise spin are Z (figure 2). Plying is a process through which yarns are strengthened by spinning single strands together. Yarns are plied to strengthen them for the weaving process as the warp-faced weaves of the Andes require enough strength to not break under the tension and friction required to produce them (Rowe 1977). Yarns are dyed before they are woven. Andean weavers produce a variety of colors using natural dyes (Callañaupa Alvarez 2012; Phipps 2010; Rowe et al. 2007). Cochineal, an insect-based dye, is the most famous and can produce a variety of colors including oranges, pinks, reds, and purples. (Callañaupa Alvarez 2012; Phipps 2010).



**Figure 2.** Illustration of yarn twist direction.

The weaving process is completed using a simple loom where tension is provided with a backstrap or posts (Arnold and Espejo 2015; Franquemont and Franquemont 1987; Minkes 2005; Rowe 1977; Zorn 2004). The warp of the textile piece, those yarns held under tension, is wound first around wooden stakes before being transferred to the loom (Franquemont and Franquemont 1987; Rowe 1977). In warp faced fabrics, like those woven today in the highland Andes and prehistorically by the Chiribaya, the surface of the fabric consists of these more densely packed warp threads (Arnold and Espejo 2015; Rowe 1977). A shed is opened between alternating warp threads. Then the weft, the thread added to the fabric during the weaving process, is passed between the warp threads through the shed. Warp-faced designs are made by pairing two different colors on each side of the manipulated warp threads in the shed. Instead of alternating warp threads of the same color in the shed, several warps in a row are selected, making the second warp color visible in sections. This process can produce a wide range of designs and motifs (Arnold and Espejo 2015; Callañaupa Alvarez 2012; Meisch 1985; Rowe 1977).

Andean textiles are linked to and a signal of individual and group identities (e.g., Boytner 1998; Cieza de León [1554] 2010; Femenías 2005; Franquemont 1997; Guamán Poma [1613] 2009; Morales 2012; Reycraft 2005; Rodman 1992). For example, the Inka Empire used clothing styles to differentiate between ethnic groups (Betanzos [1557] 1996). This practice continues in the modern Andes where groups signal their ethnicity and other social identities through dress (Femenías 2005; Medlin 1986; Meisch 1985; Morales 2012). Furthermore, many Andean groups feel that clothing is essential to identifying their individual communities (Medlin 1986; Meisch 1985). In Calcha, Bolivia, residents actively regret textiles leaving their community (Medlin 1986:276). Furthermore, archaeological textile analyses in the Atacama Desert have revealed that

individuals affiliated with the Tiwanaku polity were distinguished from local community members through tunic styles (Rodman 1992). Thus, textiles are and have been a signal of community identity for Andean peoples.



Figure 3. Example of hexagon motif from Taquille Island. Textile in the collection of Emily A. Schach.

Textile iconographic motifs often reflect aspects of the social and environmental landscape, while simultaneously communicating group and individual identities. Numerous motifs are associated with individual communities (Franquemont 1986; Meisch 1985; Silverman 2008; Zorn 2004), including the Loraypu design which is produced in Chinchero, Peru (Franquemont 1986). For example, the weavers of Taquille Island on the Peruvian side of Lake Titicaca produce a number of textile designs associated with the island, one of which is a small hexagon divided into 6 pieces (figure 3, Zorn 2004). This iconographic design represents the division of the island into six *suyus*, which form the land-tenure division for crop rotations on the island, thus representing the physical and social landscape (Zorn 2004). That this figure is also

associated with the island of Taquille means that it also communicates the identity of the weaver and wearer as Taquillian to outsiders.

Textiles, like *chuspas*, continue to play an important role in the portrayal and reification an individual's social identities in death, as Andean funerary objects often belong to the deceased (e.g. Ackerman 1991; Cieza de León [1554] 2010a:117; Cobo [1653] 1990:250). For example, in Abancay, Peru, during the funerary ritual an individual's best clothes are washed and then the body of the deceased dressed in a manner reflecting their own stylistic preferences during life (Ackerman 1991:243). Cobo describes a similar practice during the Inka period ([1653] 1990:250). Numerous archaeological studies of Andean textiles have noted wear on the items interred with the dead (Cassman 2000; Minkes 2005; Rodman 1992), suggesting that they had been worn and used during life by the decedent.

In this study, we consider the stylistic differences between *chuspas* present within mortuary spaces as reflecting social identities and their continued formation by living individuals involved in the funerary process. *Chuspas* remain important signifiers of social identity in the Andes (Sharratt 2014), and we argue that their stylistic variation, including iconography, signals and reifies an individual's community identity.

### **Coca Ritual and the Landscape**

In the modern Andes, coca chewing is a social act (Allen 1988; Bolin 1998; Grisaffi 2010). In the Peruvian highland community of Sonqo, coca use has clearly defined rules of etiquette (Allen 1981:157), whereas in lowland Bolivia, coca use is not accompanied by these rules but is still viewed as a social act (Grisaffi 2010). In both places, refusal to participate in coca chewing is viewed as a refusal to socialize. Coca is frequently shared and exchanged at the beginning of a social interaction and signifies a

reciprocal relationship between users (Abercrombie 1998; Allen 1988; Bastien 1978). This reciprocal relationship is reified through the continual sharing of coca during social interactions throughout the day. For example, Allen (1988) reports that highland villagers use coca four to five times throughout the day, and each time coca is shared.

Thus, coca is used to cement relationships amongst individuals, but the coca sharing ritual also references the landscape. In highland coca practices, coca has a powerful essence that is offered during coca chewing etiquette known as *k'intu* (Allen 1988:103-104; Bolin 1998:15; Gifford and Hoggarth 1976:9). During *k'intu*, individuals select three to five of their best coca leaves and arrange them between their thumb and forefinger. Then they blow on the leaves and make an invocation to the earth, locally venerated places, and their *ayllu*. These are meant to be the recipients of the coca leaf's essence. In the highlands, the mother earth (*Pachamama*) and divine mountains (*apus*) are amongst these recipients as participants ask for their continued blessings (Bolin 1998; Radcliffe 1990). Thus, coca chewing, conducted multiple times a day, continually reifies the social contract between individuals, their *ayllu*, and the landscape.

### **Ilo Chiribaya**

The Ilo Chiribaya polity, centered in the lower Osmore Valley of southern Peru (figure 4), largely dates to the Late Intermediate Period (Buikstra 1995). Chiribaya ceramics have been found in southern Peru and northern Chile stretching in the north from Arequipa and south to Azapa (Focacci 1990; Jessup 1991; Kolomanski 2016; Muñoz Ovalle and Focacci A. 1985). The Ilo valley is one of two major Chiribaya centers; the other is south in the Azapa valley of northern Chile, where Chiribaya are known as Maitas (Jessup 1991; Muñoz Ovalle and Focacci A. 1985). These two Chiribaya centers share stylistically similar material culture, especially in the form of

ceramics and textiles, although the ceramics of the Ilo Chiribaya are finer than their Chilean counterparts. Skeletal and material remains from Ilo Chiribaya affiliated sites indicate varied diets (Knudson et al. 2007; Tomczak 2003), multiple occupational community groups (Lozada and Buikstra 2005), and rich material culture (Boytner 1998; Clark et al. 1993; Jessup 1991; Lazo 1990). Chiribaya-affiliated human remains have also figured in numerous paleopathology studies, especially those regarding tuberculosis in the Americas (Bos et al. 2014; Harkins et al. 2015; Salo et al. 1994). Here we focus on the Chiribaya polity as a *señorío*.



Figure 4. Map of Ilo Chiribaya sites discussed in this text.

Numerous lines of evidence support the hypothesis that Chiribaya political economy resembled a *señorío*, including site locations, material culture, cranial



modification and dietary differences (Buikstra et al. 2005; Lozada 2011; Lozada and Buikstra 2005; Tomczak 2003). The Chiribaya *señorío* was a loosely organized coastal polity consisting of two economically specialized groups (Buikstra et al. 2005; Lozada and Buikstra 2002, 2005). The first group, the *labradores*, was terrestrially based, cultivated agricultural land, and tended camelid herds for the polity (Lozada and Buikstra 2005). The *pescadores* were the second group and were responsible for the marine based activities within the *señorío* (Lozada and Buikstra 2005). These specialized economic groups are similar to those described ethnohistorically (Rostworowski 1970, 1977, 1989), although biodistance analysis suggests that groups within the Chiribaya *señorío* were exogamous, in contrast to ethnohistorically described *señorios* (Lozada and Buikstra 2005).

Archaeological research supports the assertion that *labradores* and *pescadores* had different lived experiences within the *señorío* (Jessup 1991; Lozada Cerna 1998; Tomczak 2003). The locations of Chiribaya sites supports this inference, as several locales, including San Geronimo located in the modern city of Ilo, are located within half a kilometer from the ocean and are well suited for maritime activities. Evidence of maritime activity at San Geronimo includes eight stone-lined storage pits containing small dried fish (Jessup 1991). In contrast, other Chiribaya sites, such as El Yaral, are located further inland and better suited for agro-pastoral activities. Camelids are largely absent from the graves at Yaral, but there nine camelid sacrifices are associated with a large public structure (Buikstra 1995). It is clear that peoples from these two Chiribaya ayllus interacted, as graves and individuals from both *pescador* and *labrador* sites include objects associated with farming and fishing and have access to fish and terrestrial resources (Buikstra 1995; Tomczak 2003).

Bioarchaeological evidence suggests Chiribaya *labradores* and *pescadores* had differing lived experiences (Lozada and Buikstra 2005; Lozada 2011; Tomczak 2003). Isotopic carbon and nitrogen analyses of bone collagen and apatite reveal differences between access to marine and C<sub>4</sub> plant resources within the Ilo Chiribaya polity (Tomczak 2003). Dietary consumption varies between Ilo Chiribaya sites; the *pescador* site San Geronimo has the highest access to marine foodstuffs, whereas the inland site of Yaral has the least (Tomczak 2003). Conversely, maize and terrestrial resources made up the primary diet for those individuals buried at Yaral (Tomczak 2003). Furthermore, it appears that Ilo Chiribaya were marking their occupation *ayllu* affiliation through cranial modification (Lozada and Buikstra 2005; Lozada 2011). Cranial modification must be completed during the first years of life (Hoshower et al. 1995; Tiesler 2014) and thus the shape of the head is a visible embodied symbol throughout life, a form of culturally mediated style which cannot be removed. *Pescadores* marked their affiliation with annular modification, the highest percentage of individuals with this type of modification are buried at San Geronimo (Lozada and Buikstra 2005; Lozada 2011). In contrast, individuals at the inland agriculturally oriented site of El Yaral, have a fronto-occipital style of modification. These lines of evidence indicate that *labrador* and *pescador* identities impacted the lived experiences of individuals, rather than simply occurring in Chiribaya mortuary contexts.

*Ayllu* identity was also marked materially in Chiribaya mortuary contexts (Jessup 1991; Lozada et al. 2009). For example, mortuary ceramics buried at San Geronimo tend to be decorated with multicolored bands and semi-circles, whereas ceramics at El Yaral are more frequently decorated with eight-pointed stars and trapezoidal panels depicting stepped pyramids (Jessup 1991). Furthermore, graves from San Geronimo contain a

variety of fishing paraphernalia, objects these individuals would have been using occupationally (Jessup 1991).

### ***Chiribaya Alta***

Chiribaya Alta is the largest, most complex Chiribaya-affiliated site in the coastal Ilo valley (Buikstra 1995; Buikstra et al. 2005; Jessup 1991). Dates from Chiribaya Alta indicated that it is the earliest excavated Ilo Chiribaya site, with dates ranging from AD 775 to 1100. It is complex, bounded by a wall, and contains both cemeteries and domestic areas. Chiribaya Alta is located on the Pampa overlooking the Ilo Valley, approximately 5 km from the coast, which makes it well suited to agro-pastoral and maritime subsistence activities (Buikstra 1995; Jessup 1991). Chiribaya Alta (figure 5) contains formally bounded cemeteries, agricultural terracing, domestic structures, and an earthwork that encircles part of the site (Buikstra et al. 2005). Nine cemeteries are present, which have yielded 307 tombs in excavations (Buikstra 1995). There is considerable variability in terms of mortuary offerings and many tombs from Chiribaya Alta are relatively elaborate, containing ceramics, ornaments, food items, and tools (Buikstra 1995:260).

Chiribaya Alta includes burials of both *labradores* and *pescadores* (Buikstra et al. 2005; Lozada and Buikstra 2002; Lozada et al. 2009). It contains nine cemeteries, two of which, Cemeteries 4 and 7, contain the most elaborate tombs at Chiribaya Alta (Buikstra et al. 2005). These two cemeteries are differentiated across occupational *ayllu* identity; Cemetery 4 is associated with *pescadores* and Cemetery 7 with *labradores*. The differences present between *labradores* and *pescadores* present at San Geronimo and El Yaral are similar to those present between Chiribaya Alta Cemeteries 4 and 7. Individuals

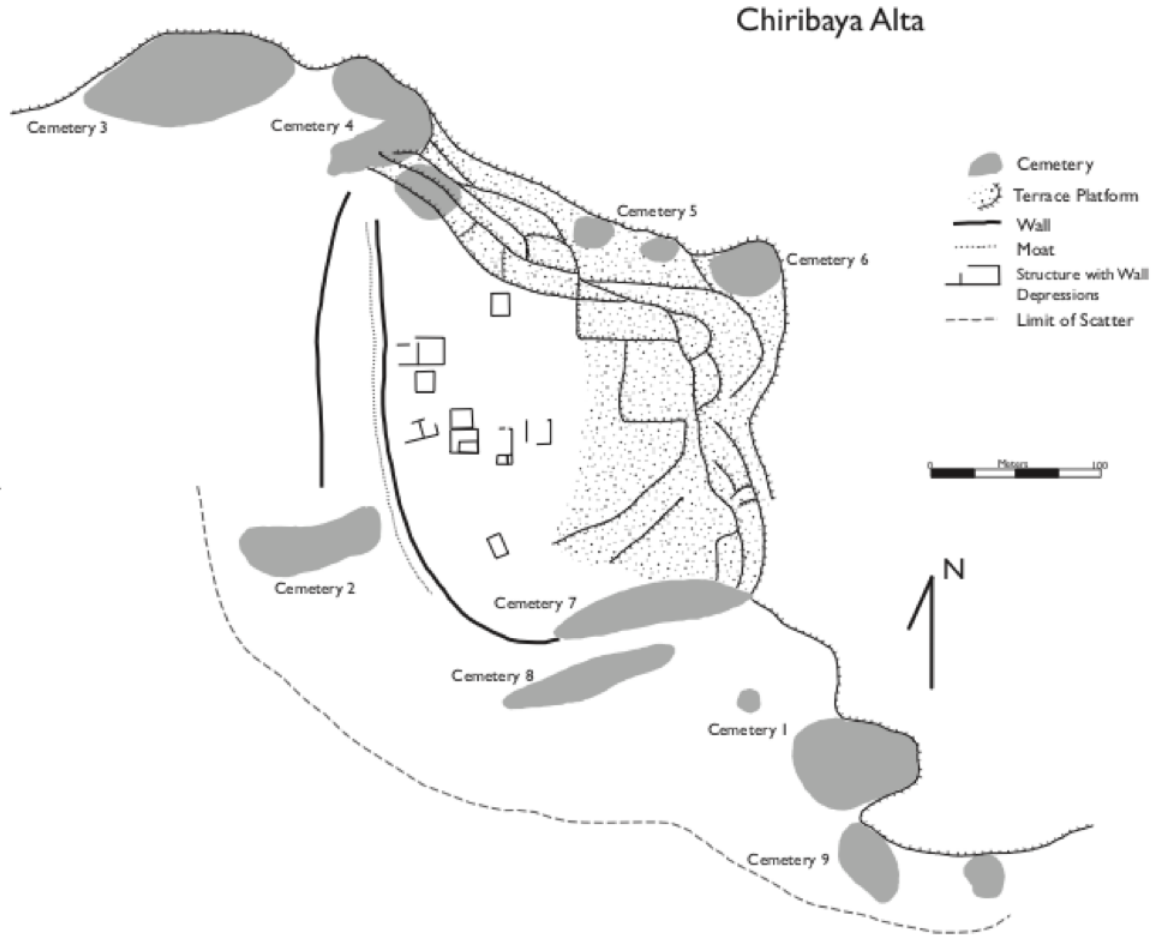


Figure 5. Site map of Chiribaya Alta.

in Cemetery 4 (*pescadores*) tend to have annular cranial modification and isotopes indicate that marine resources were a large component of their diet. In contrast, individuals buried within Cemetery 7 (*labradores*) tend to have fronto-occipital cranial modification, were eating fewer marine resources than those individuals from Cemetery 4, and have a high frequency of camelids in their graves (Lozada and Buikstra 2005; Lozada et al. 2005; Tomczak 2003). These cemeteries are not fully contemporaneous, but there is chronological intersection and similar material culture items recovered from graves (Buikstra et al. 2005). The earliest date from Chiribaya Alta is from Cemetery 7 and thus this cemetery was in use before Cemetery 4, which dates to the middle of the

Chiribaya occupation of the site. Despite these temporal differences, we believe that the distinctions between Cemeteries 4 and 7 primarily reflect community identities.

### *Chiribaya Coca Use*

This paper focuses on *chuspas*, which are portable bags used to transport coca. Here we argue that Chiribaya *chuspas* reflect the importance of coca. *Chuspas* are intimately related to coca ritual, which in turn articulate with the landscape and thus *ayllu* affiliation. *Chuspas* usually have a limited role in coca rituals, but in northern Bolivia men exchange *chuspas* as a part of coca etiquette (Bastien 1978). In other locations, *chuspas* are less active participants in coca ritual (Allen 1988; Sharatt 2014).

*Chuspas* are often present in archaeological contexts. To define *chuspas*, we draw upon the work of Horta and Aguero (1997:48), who studied Late Intermediate Period *chuspas* from the Azapa, Chile region, including those associated with Maitas-Chiribaya. The Maitas-Chiribaya share cultural characteristics with Ilo Chiribaya, including textile forms and motifs. *Chuspas* are defined as having the following five characteristics. First, *chuspas* usually have a trapezoidal form, although some *chuspas* are square or rectangular. Second, *chuspas* are usually woven with multiple colors, and iconography is usually white contrasted with another color or colors. *Chuspas* are also usually decorated with iconography produced through the use of complementary warps, which create a double-sided design. Decoration is also often extended through multi-colored embroidered side seams created through cross-knit looping. Finally, *chuspas* found within archaeological contexts in Azapa usually contain coca. This description of *chuspas* in Arica features are similar to many *chuspas* found within Ilo Chiribaya contexts, which have also been described as trapezoidal with iconography produced with complementary warps (Boytner 1998; Clark et al. 1993).

The Chiribaya were certainly using coca, indicated by the presence of coca and *chuspas* in mortuary contexts, bioarchaeological dental analysis, and benzoylecgonine hair tests (Aufderheide 1990; Cartmell et al. 1994; Clark et al. 1993; Indriati and Buikstra 2001). Coca quids have been discovered in the mouths of Chiribaya mummies in both Azapa and Ilo during autopsy (Aufderheide 1990; Cartmell et al. 1994). Hair and nail tests for the benzoylecgonine metabolite of coca in Chiribaya mummies from both locales also suggests high use within the Chiribaya polity (Cartmell et al. 1994). Of the Ilo Chiribaya samples 45% (37/82) tested positive for the metabolite, meaning that they had used coca during the year before death (Cartmell et al. 1994:90). A combined sample of Chiribaya individuals from Azapa and Ilo did not suggest differences between male and female use (Cartmell et al. 1994:91). Bioarchaeological dental analyses have also been performed on a segment of the sample from Chiribaya Alta, and unlike hair, dental pathologies reflect long term cumulative coca use (Indriati and Buikstra 2001). Dental analyses suggest a similar rate of coca use as hair tests, with 42% (11/26) of individuals showing strong indicators of coca use, including molars with deep and wide cervical root carious lesions on the buccal side, which is where quids were held in the mouth. These data suggest that coca rituals were performed frequently during life by nearly half of the Chiribaya population. Hence, the *chuspas* used to carry coca would have been a visible symbol of coca use and displayed regularly.

### **Materials and Methods**

This analysis uses the Chiribaya Alta textile collections from the 1989 and 1990 excavations, which are currently housed at Centro Mallqui in El Algarrobal, Peru. The total sample is 87 bags, the majority of which are from Cemeteries 4 and 7 (n=63). Bags from all cemeteries were included in the initial analysis, although this discussion focuses

largely on Cemeteries 4 and 7. These bags are all from provenienced mortuary excavations, although one bag was recovered from the surface in Cemetery 1.

Analyses of the *bolsas* from Chiribaya Alta use standard methods in textile analysis, focusing on stylistic textile structure, yarns, design, and function. Classification of structure primarily used the guidelines from Emery (1994), as either warp-faced, weft-faced or balanced. Balanced weaves show the warp and weft equally in the finished fabric. In contrast, warp-faced weaves show only the warp in the final fabric and weft-faced weaves show only the weft. Chiribaya textiles are almost exclusively warp-faced in structure, although some belts use an oblique braiding technique (Clark et al. 1993; Minkes 2005). Average warp and weft counts were estimated using a linen tester and multiple counts from the textile specimen. The average weave counts indicate the density of threads in the weave, warp faced fabrics always have a higher average number of warp threads rather than weft threads.

Yarn was classified according to fiber, color, and spin/ply. Fibers were identified as either camelid or cotton. Previous analyses of Chiribaya textiles indicate that camelid wool is the most common material used to construct Chiribaya textiles (Boytner 1998; Minkes 2005; Reycraft 2005). Thus, while being centered on the Coast and in mid-valley the Chiribaya polity clearly had access to herds (Jessup 1990, 1991). Cotton is not commonly found in Chiribaya textiles except for rope (Minkes 2005). Rarely, textiles incorporating human hair (Minkes 2005; Rosenzweig and Artz 2011) and vegetation (Minkes 2005) have been reported in Chiribaya contexts but these were not encountered in the Chiribaya Alta bolsa sample. Colors were coded using general categories. Yarn spin and ply were classified using the parenthetical notation method, which uses nested parentheses to group yarns into production stages (Splitstoser 2012). This formulaic

method of recording yarn structure uses the same order of operations as mathematical equations. Previous Chiribaya textile analyses have reported almost exclusively Z-spun and S-plied yarns (Minkes 2005; Reycraft 2005), which is recorded as S(2Z) using parenthetical notation. It represents 2 z-spun singles, placed within the parentheses, plied together in an s-direction.

Supra-structures (e.g. seams and end finishes) were also classified using Emery (1994). This information includes the stitch used in seams, braids or tassels attached to bags, and the presence of cross-knit looping. The Ilo Chiribaya are known to use cross knit looping embroidery to decorate the side seams of tunics (Minkes 2005) and *chuspas* from Azapa decorated with cross knit looping (Horta and Aguero 1997:48).

All *bolsas* were also measured for size, and their form (rectangular or trapezoidal) was recorded. Minkes reports that Chiribaya *chuspas* range from 17 x 22 cm to 25 x 30 cm. Trapezoidal and rectangular bags have been recorded at Ilo Chiribaya contexts (Clark et al. 1993; Minkes 2008). The trapezoidal shape is the result of increased warp spacing for the fabric woven at the base of the bag (Clark et al. 1993).

Analysis of iconography included classification informed by analyses of archaeological textiles in Arica (Horta and Aguero 1997; Ulloa Torres 1982) and modern ethnography (e.g., Franquemont 1986; Silverman 2008). Designs use complementary warps, which produce a double-sided cloth (Clark et al. 1993:19; Minkes 2005), but there is at least one textile using supplementary warps in the Chiribaya Baja collection (Clark et al. 1993:12). Chiribaya designs range from simple lateral stripes to linear panels of geomorphic, zoomorphic, and anthropomorphic figures (Clark et al. 1993; Horta Tricallotis 1998; Lazo 1990; Minkes 2005; Ulloa Torres 1982; Umire and Miranda 2001). All designs were documented through photography and then classified.



Iconographic designs were categorized as: connected hooks, serpents, s shapes, stepped triangles, 8 pointed stars, modified ladder designs, diamonds, abstract panels, double headed llamas, pumas, anthropomorphic figures, and vined triangles. Differences in the frequency of iconography designs were tested using Fisher's Exact Test.

## **Results**

Eighty-seven bags from the Chiribaya Alta collection were analyzed as part of this study. Here we present the results of the analysis for all bags overall, differences by bag types, and a comparison between Chiribaya Alta cemeteries 4 and 7.

In terms of weave structure, all bags analyzed from Chiribaya Alta were warp-faced in structure. The average weave counts reflect a sample of finely woven bags. The average weft was 8.5 threads per cm ( $s$  1.927,  $n=86$ ) whereas the average warp was 32.89 threads per cm ( $s$  7.455,  $n=86$ ).

The yarns used in bags from Chiribaya Alta also display technological consistency. Wool is the dominant material used in bags; only one bag from Chiribaya Alta was made of cotton. Yarns were always S(2Z) with no variation in spin and ply direction. The Chiribaya Alta bag sample did contain yarns in a wide variety of colors including red, purple, white, blue, green, orange, and tans. Bag colors were classified based on the widest plain color stripes. Red bags are the most common, comprising of 75.9% (66/87) of the sample. Bags were also made in purple (13.8%, 12/87), tan (9.2%, 8/87), and green (1.1%, 1/87).

Suprastructures were also present on bags, primarily as seams but the presence of tassels, tie cords, and cross-knit looping edge finishes was also recorded. Side seams are present on all bags, commonly created in overcast stitch 59.8% (52/87), but 39.1% of bags had cross-knit looping covering the seam (34/87). One bag was stitched with a

running seam (1.1%). Tie cords were present on 62.1% (54/87) of bags. These tie closures were attached to the superior edge of a side seam and looped around the top of the bag to close it. Many bags in the collection were still tied shut with contents inside. Some bags also had evidence of being tied shut but lacked a tie closure, suggesting that this element was destroyed at some point after internment or something else was used to tie the bag shut. Nine bags in the sample had tassels attached to the lower edge. Cross knit looping was used as a superior edge finish in 32.2% (28/87) of bags.



Figure 6. Photo of Chiribaya *chuspa* (ChA Cem 4 Tomb 419 #3704.06.10) showing typical form and organization. Note the red pampa sections between iconographic warp stripes. The middle iconographic stripe consists of a puma figure motif, and the two lateral stripes have the connected hook motif.

Bags varied in form and size but the most common form was trapezoidal (44/53). Other bags were rectangular in shape (9/53). The average dimensions of all bags are 25.4 cm (n=53, s.d.=15.13) in length and 25.2 cm (n=52, s.d.=7.127) in width.

Bags decorated with iconography make up 74% of the Chiribaya Alta sample (64/87). The rest of the sample consists of plain bags (8.05% 3/87), costals (large storage bags; 2/87), and bags decorated with plain warp stripes (20.69% 18/87). Bags with iconography from Chiribaya Alta are similar to those described by Horta and Aguero (1997). A *chuspa* with iconography from Chiribaya Alta is a single web warp-faced bag. They are usually either red (53/65) or purple (10/65). Side seams are finished with overcast stitching or cross knit looping. Bags with woven iconographic motifs have side seams finished in overcast stitches or cross-knit looping. Bags with iconography are the only ones to have tassels along the lower edge. They are trapezoidal in shape (42/44) and approximately 27 cm in width by 24 cm in height. Bags with iconographic motifs usually have three linear stripes separated by wide stripes of a single color and smaller warp stripes near the design (figure 6).

Variation, however, is present in the iconographic motifs of bags at Chiribaya Alta. A wide variety of iconographic motifs occur on bags, including connected hooks (22/64), serpents (10/64), s shapes (10/64), stepped triangles (9/64), 8 pointed stars (6/64), modified ladder designs (9/64), diamonds (6//64), abstract panels (2/64), double headed llamas (3/64), double headed pumas (2/64), anthropomorphic figures (6/64), and vined triangles (3/64). These motifs are featured in figure 7. Some of the bags in the sample contained multiple designs, in which case each design was counted separately.

The frequency of motifs varies between the *pescador*-affiliated Cemetery 4 and *labrador*-affiliated Cemetery 7 at Chiribaya Alta. More than three-quarters of the *chuspas*



Figure 7. Iconographic motifs featured on *bolsas* from Chiribaya Alta. Top row: scrolled hooks, snake, snake, s-figure, and s-figure. Middle row: stepped triangles, large 8-pointed star, small 8-pointed star. Bottom row: double headed llama, double headed puma, anthropomorphic figure, and vined triangles.

in the Chiribaya Alta textile collection come from cemeteries 4 and 7 (82.81%, 53/64). There are more *chuspas* in Cemetery 7 (31) than in Cemetery 4 (22). The most common designs in these cemeteries are the connected hooks, serpents, s-shapes, and stepped triangles (figure 7).

Two of these designs occur more frequently on *chuspas* from Cemetery 4 than Cemetery 7. The first motif is the most common from cemetery 4, connected hooks and/or volutes, which are present on more than half the *chuspas* from this cemetery (55%, 12/22). In contrast, this motif only occurs on approximately a quarter of the *chuspas* in Cemetery 7 (26%, 8/31), a statistically significant difference (Fisher's Exact Test,  $p=0.0461$ ). Designs with snake heads were also more common in Cemetery 4, 32% (7/22) compared to 6% (2/22) of cemetery 7 *chuspas* (significant,  $p=0.0244$ ).

Two design motifs are more common in Chiribaya Alta Cemetery 7. The most common design, a stepped triangle motif produced through a modified ladder weave, occurred on 29% (9/31) of *chuspas* but was absent from Cemetery 4 (significant,  $p=0.0069$ ). The s-figure also occurred more frequently in Cemetery 7, 5% (1/22) vs 19% (6/31; not significant,  $p=0.2177$ ).

Frequency of Iconographic Motifs in Chiribaya Alta Cemeteries 4 and 7								
Cemetery	Total Bags	Bags w/Iconography	% w/Iconography	Warp Stripes	S-Shape	Isosceles Triangle	Snakes	Connected Hooks
4	28	22	79%	21%	5%	0%	32%	55%
7	35	31	89%	11%	19%	29%	6%	26%
Total	63	53	84.1%	18.9%	13.2%	17.0%	17.0%	37.7%

Table 1. This table shows the different frequency of the four most common iconographic motifs on *chuspas* from Chiribaya Alta Cemeteries 4 and 7.

## Discussion

The results from the Chiribaya Alta *bolsa* analyses suggest that members of the Chiribaya *señorío* were marking their occupational *ayllu* identity through *chuspa* iconography. Here, we argue that iconographic motifs from Chiribaya Alta Cemeteries 4 and 7 reflect *ayllu* affiliation through representation of expected aspects of the natural landscape. Here we will discuss the four most common motifs in Cemeteries 4 and 7, and explore their potential use as symbols related to *pescador* and *labrador* identities.

Cemetery 4 is associated with *pescadores*, and thus it has individuals who were involved in maritime occupational activities. *Pescadores* used iconographic motifs on *chuspas* to signal their identity. We believe that the two iconographic motifs most common within cemetery 4, connected hooks and snakes, are also symbolically associated with water, which is suggested by modern ethnography and ethnohistory (Arnold and Espejo 2015; Dransart 1995; Urton 1981).

The connected hook design is the most common iconographic motif present on *chuspas* at Chiribaya Alta, but it occurs more frequently in Cemetery 4. This design also occurs in the nearby Arica Valley during the Late Intermediate Period, which was inhabited by the related Maytas-Chiribaya polity (Arnold and Espejo 2015). This design is also produced in modern communities in highland Bolivia (Adelson and Tracht 1983; Meisch 1997). Arnold and Espejo (2015) have argued that this design reflects water flowing in an arid desert environment, like that of the south-central Andean coast. Water would have been important to all Chiribaya living in the Osmore drainage due to the desert environment, but especially for those individuals identifying themselves as *pescadores* for whom the ocean served as an essential source of food and livelihood.

The second motif to occur more frequently in cemetery 4 is the serpent, which is also associated with water (Urton 1981). Images of serpents appear on textiles throughout the Andean archaeological and ethnographic record (Dransart 1995; Dwyer 1973; Horta 1997; Peters 2002). The serpent also features prominently within Andean myth (Urton 1981; Dransart 1995). According to Gary Urton (1981:88) *amarus* are double-headed serpents who live in water springs and emerge as a rainbow during precipitation. These serpents are thus a signal of rain. The serpents portrayed by the Ilo Chiribaya in their textiles also have two heads and are sometimes backed by rainbows suggesting that elements of the *amaru* myth existed during the Late Intermediate Period.

*Labradores* buried in Cemetery 7 at Chiribaya Alta also used textile iconographic motifs to signify their occupational *ayllu* identity and relationship with the landscape. Two textile motifs are most common in cemetery 7, the s-shape and isosceles triangles. We believe that these designs are a signal of *labrador* identity and served as symbols related to the terrestrial earth and agricultural activities.

The s-shape motif is associated with cemetery 7 at Chiribaya Alta and is a common textile motif in modern and archaeological Andean textiles (Clark 1993; Franquemont 1986; Horta Tricallotis 1998; Silverman 2008; Ulloa Torres 1982). In the modern Andean highlands this motif is called *kuti*, which means that which returns in Quechua (Franquemont 1986; Silverman 2008:160). This name is shared by an Andean hoe used to harvest potatoes, which has the same shape (Franquemont 1986). Multiple ethnographic sources from the Peruvian highlands present this motif as representing the hoe itself (Callañaupa Alvarez 2012; Silverman 2008), and thus this motif relates to agricultural production. The association between this iconographic motif and Chiribaya

Alta Cemetery 7 suggests that this symbol was also related to agricultural activities for the Ilo Chiribaya and used to signify *labrador ayllu* identity.

The final motif involves stepped isosceles triangles formed through a modified ladder weave. Multiple modern Andean sources suggest that triangle figures represent mountains on Andean textiles (Callañaupa Alvarez 2012:103; Silverman 2006; Strong 2012). Triangles on modern Andean textiles appear in borders and in motif panels. In Qeros and other highland villages, the *k'iraqey puntas*, a border pattern of isosceles triangles, represents mountain peaks (Silverman 2008:61-62). Local villagers identify the triangle motifs by the same name as mountains and always represent mountains using isosceles triangles in landscape drawings. Borders of triangles also represent mountain tops in Chinchero, Peru (Callañaupa Alvarez 2012:103). The triangles in Chiribaya textiles have a stepped hypotenuse. Strong (2012:78) identifies these stepped triangles, sometimes paired with another, as mountain symbols in Peruvian art. Thus, we believe that these figures are also related to mountains amongst the Ilo Chiribaya.

This symbol is exclusively associated with *labradores*, for whom mountains and the sacred terrestrial landscape provided food and livelihood. It is also likely that Chiribaya camelid herders would have had to make trips to the Peruvian highlands, the domain of the glaciated Cordilleras Blancas. In modern highland villages, mountains are regarded as sacred living gods (Allen 1988; Bastien 1978; Bolin 1998). They are viewed as liminal spaces that are preferred for rituals because they touch the realm of spirits (Strong 2012:78). The Inka performed such rituals, including the sacrifices of children and adolescents on sacred snow-topped mountains throughout the Andes (Ceruti 2004; Fernández et al. 1999; Sillar 1994). Mountains also appear to have been important during the Middle Horizon (e.g. Kolata 1993; Williams and Nash 2006). For example, the Wari



in Moquegua oriented their architectural complexes on Cerro Baúl to higher snow-capped mountains visible from the summit (Williams and Nash 2006). The presence of mountains on Chiribaya *chuspas*, especially on those belonging to farmers and herders, suggests that they were also venerated places within the lower Osmore drainage. The adoption of the mountain symbol by *labradores* signaled and embodied their relationship with Andean peaks.

The distribution and frequencies of iconographic motifs from Ilo Chiribaya *chuspas* in Chiribaya Alta Cemeteries 4 and 7 indicate that occupational *ayllu* membership was marked materially in a way that highlights differing *pescador* and *labrador* relationships with the landscape. Bioarchaeological evidence and the presence of *chuspas* in these two cemeteries show that both *labradores* and *pescadores* were performing coca rituals, but their *chuspas* indicate that these two groups had different landscape affiliations and thus likely made their coca offerings to either terrestrial or marine features depending on occupational *ayllu* membership.

## **Conclusion**

Based on our analysis, it is clear that the iconography on *chuspas* signaled and reified occupational *ayllu* identity within the Ilo Chiribaya *señorío*. Furthermore, the motifs discussed above are linked to *ayllu* identity in a way that reflects the livelihood and landscape affiliation of *labradores* and *pescadores* buried at Chiribaya Alta. *Pescadores* (fishers), involved in maritime exploitation, were more likely to have connected hooks and snakes on their coca bags. Both of these symbols are related to water in the modern and ethnohistoric Andes, and the manner in which *pescadores* are associated with these symbols reflects their relationship with the ocean. In contrast, the

*chuspas* belonging to *labradores* (agro-pastoralists) more frequently have the s-shape and stepped triangle figures, symbols associated with farming and the sacred landscape.

The Ilo Chiribaya used their *chuspas* regularly. Dental and chemical analyses of hair indicate that the rate of coca use within the *señorío* was high, approximately 45% of individuals were using coca on a regular basis (Cartmell et al. 1994; Indriati and Buikstra 2001). Thus, *chuspas* would have consistently reinforced and symbolized occupational *ayllu* identities through their use in coca rituals. The motifs present on coca bags are an example of how the signaling of Ilo Chiribaya *ayllu* identities extended into practices shared by both *labradores* and *pescadores*, since bags were abundant in both cemeteries.

Therefore, Chiribaya groups within the *señorío* were marking themselves in a visible way, which would have been apparent in daily practice. Dietary isotopes and cranial modification have already identified how these identities were embodied biologically and iconographic differences are present materially on ceramic vessels (Jessup 1991; Lozada 2011; Tomczak 2001). Variation in the iconographic motifs on *chuspas* demonstrate that the Chiribaya also embodied these identities through visible textile symbols.

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## CHAPTER 3

### GENDER ROLES AND IDENTITY AT CHIRIBAYA ALTA:

#### A MULTIPLE CORRESPONDENCE ANALYSIS OF MORTUARY CONTEXTS

Understanding the variability of gender expression across space and time is an important anthropological contribution. Archaeologists have used a variety of methods and contexts to understand gender in the past, including households (Allison 2015; Gero and Scattolin 2002; Hastorf 1991; Hendon 1996, 1997), iconography (Alberti 2005; Hubert 2016; Joyce 1993; Mandell 2015; Peled 2016), mortuary contexts (Arnold 1991, 2002; Bacus 2007; Clayton 2010; Hamlin 2001; Knüsel and Ripley 2000; Marcus 1993; Sofaer Derevenski 1997, 2002), and bioarchaeology (Bentley et al. 2007; Geller 2017; White 2005). Recent critiques, however, point out that approaches to gender identity in archaeology have struggled with the imposition of Western gender binaries onto the past (Geller 2009; Gero and Scattolin 2001; Jordan 2016; Stockett 2005). In this paper, we argue that it is possible to avoid such bias through the use of multivariate analytical techniques (Stratton 2016).

Previous univariate analyses at the Late Intermediate Period site of Chiribaya Alta, Peru have identified gendered grave goods, potentially related to gender roles during life (Lozada and Rakita 2013). These analyses, however, assume a binary distinction between males and females by only testing those graves with sexed skeletons a practice that limits the skeletal sample available to bioarchaeologists and ignores the culturally-constructed nature of both sex and gender. Furthermore, a solitary focus on normative gender roles prevents archaeologists from understanding the nuanced ways in which gender identity manifested in individual lives.

Here, we use a multivariate technique, multiple correspondence analysis (MCA), to analyze the graves at Chiribaya Alta. Sex is not included in this analysis and thus, the MCA groups graves without the binary assumption of sex. Instead, sex information is only used in the interpretation phase of the analysis. We argue that this holistic multivariate approach to archaeological mortuary assemblages is better able to understand the differences between normative gender roles and individual expressions of gender identity. Our analyses reveal that there is fluidity in individual gender identity whereas normative gender roles reflect a complementary gender ideology.

### **Theoretical Approaches to Gender**

Gender has become an active arena of archaeological research over the last several decades (e.g. Alberti 2005; Allison 2015; Arnold 1991, 2002; Bacus 2007; Clayton 2010; Damm 1990; Geller 2008, 2009b, 2017; Gero and Conkey 1991; Gero and Scattolin 2002; Hamlin 2001; Hastorf 1991; Hendon 1996, 1997; Hubert 2016; Joyce 1993, 2001; Knüsel and Ripley 2000; Mandell 2015; Marcus 1993; Peled 2016; Sofaer Derevenski 1997, 2002; White 2005; Stockett 2005). Here, we present the gendered theoretical perspectives of interest to us and define the terms used in this study of Chiribaya gendered expression.

Sex and gender exist in a system that is culturally constructed (Rubin 1975). Traditionally, bioarchaeologists have viewed sex as a fixed binary biological characteristic, which can be classified using morphological markers on the human skeleton (Geller 2008; Walker and Cook 1998). This view of sex, however, does not consider the variation present in human sexual difference and the culturally-constructed nature of sex (Fausto-Sterling 1993; Geller 2008; Hubbard 1996). Human sexual difference, which in a binary system is considered male or female, can be classified in a

variety of ways. The male/female binary conception of sex has not been stable throughout history, as a one-sex model predominated from the Classic Period until the seventeenth century, where human sexual difference was considered a variation of the male sex. More recently, Anne Fausto-Sterling (1993) points out that human sexes can be classified differently, suggesting five sexes that consider intersex variation: male, female, herm, ferm and merm. Thus, it is clear that the manner in which sexes are classified is culturally constructed. The methods employed by bioarchaeologists rely on modern sex binaries to classify the sex of the dead. Here, we rely on these classifications to guide our interpretations of Chiribaya gender, but we acknowledge that the concept of a fixed biological sex untouched by culture is inappropriate. As such, in this paper we use the terms male and female to describe human sexual difference. We have not limited our sample to sexed skeletons, however, in an effort to acknowledge the variation of human sexual difference and our limitations as bioarchaeologists working with human skeletal remains.

Gender is “the cultural interpretation of sexual difference that results in the categorization of individuals, artifacts, spaces, and bodies” (Gilchrist 1999:xv). As such, it is built upon the perceived sexual differences present in the human body. Gender archaeology was initiated by Conkey and Spector (1984) who critiqued the unquestioned application of Western gender ideology onto past societies that they argued was responsible for perpetuating a universal ‘gender mythology’. Like sex, studies of gender in archaeology now emphasize the cultural construction of gender and recognize the variability inherent in cross-cultural gendered expression (e.g. Brumfiel 2006; Buikstra and Scott 2009; Geller 2009b; Gero and Scattolin 2002; Gilchrist 1999). We use the terms woman and man to signify gender in this paper and to distinguish it from sex.

Gender as a concept can be partitioned into multiple components, which describe the different ways in which it manifests within societies. Our study is primarily interested in gender roles and gender identity, as well as the relationship between these two concepts. Here we will present these two concepts in more detail.

Gender roles are the different tasks and statuses accorded to specific genders (Conkey and Spector 1984:15; Gilchrist 1999:XV; Nelson and Rosen-Ayalon 2002:7). This aspect of gender reflects broader norms and ideologies within their cultural context. For example, traditional Western gender roles expect women to take on child care tasks, while men are expected to find work outside the home. Thus, gender roles reflect broad cultural expectations and experiences related to gender.

Gender identity is the individualized portion of the larger cultural construction of gender and is defined as “the private, individual experience of gender, which is also conveyed outwardly through physical and material expressions” (Gilchrist 1999: xv). An individual’s gender identity is both distinctive and related to culturally constructed normative gender roles. Thus, gender identity describes the individual experience of gender, which is not universal within a society because individual participation in gender roles can be variable and flexibly emphasized. Flexibility in gender identity reinforces the fact that biological sex is not destiny, as an individual’s gendered expression may not be rigidly defined by their biological sex and related gender norms. For example, in modern western societies women are still expected to be mothers, however, many women are voluntarily childless and comfortable with their gender identity (Gillespie 2003).

The ethnographic Andes has similar tensions between gender roles and gender identity, an excellent example of which concerns weaving and textile production. In today’s Andes, weaving is considered to be a feminine gender role, which is extremely

time consuming and takes many years to master (Crickmay 2002; Franquemont and Franquemont 1987; Seibold 1992). But this gender role is not universal to all women in the modern Andes, as many women do not know how to weave or regularly participate in weaving tasks (Franquemont and Franquemont 1987). Additionally, participation in this task is not limited to women, and in some Andean villages men participate in weaving and other tasks related to textile production (Allen 1988; Arnold 1997). Although in these cases, men and women are usually in charge of creating different textile items and/or use different type looms (Allen 1988; Bolin 2006). This is the case on the island of Taquille, located in the Peruvian territory of Lake Titicaca, where women weave and men knit (Crickmay 2002:50). Furthermore, in her ethnography of life in a traditional village within the Peruvian highlands, Catherine Allen describes how men who participate in textile production still view the task as fundamentally feminine, for example, one of her informants notes that during February he will, “be a woman and go around knitting,” (Allen 1988:78). Thus, the practice of textile production is perceived as female gender role, but this does not prevent men from participating in this practice or change an individual’s gender identity because there is flexibility at the individual level for participation in tasks.

It is clear from these examples that while gender roles are idealized representations of the tasks men and women are expected to perform, the actual experience of completing gendered activities effects aspects of an individual’s gender identity. The concept of gender performativity explains how it is created through engagement in everyday gendered activities (Butler 1990, 1993; Gilchrist 1999; Perry and Joyce 2001). In this framework, gender identity is generated through an individual’s repeated performance of gendered acts, and is thus a performative process. Gender roles,



or the expected acts to be completed by a particular gender, are then created through the completion of these tasks by individuals of the same gender identity. This dynamic feedback loop conceptualizes the creation of gender roles and identity as a continual process within societies.

### **Gender in Mortuary Contexts**

Here we use artifact presence and absence in graves to infer gender roles and identity at Chiribaya Alta. Mortuary analyses are common within archaeology due to the wealth of information available to researchers within these contexts (e.g., Binford 1971; Brown 1995; Buikstra 1995; Gamble et al. 2001; Goldstein 1981; Rega 2000; Sofaer Derevenski 1997). These analyses, however, are not without caveats, as graves are created through ritual processes (Carr 1995; Hertz [1907] 1960; Hodder 1980; Parker Pearson 1982). In this section, we discuss these caveats and present our theoretical approach to mortuary analysis in our study of graves from Chiribaya Alta.

Tombs provide a wealth of information for archaeologists because they are purposeful interments of human remains and associated objects. Traditionally, archeologists have used the objects buried with the dead to infer aspects of their *social persona* (Binford 1971; Saxe 1970). A tomb, however, is not made by the deceased individual; instead it is created by living mourners through funerary ritual. Therefore, the items placed in the grave reflect not just the dead, but also the afterlife and the mourners (Hodder 1982). An awareness of the tripartite nature of funerary ritual was introduced by Hertz who emphasized the relationship between the body, soul and the living, as society negotiates the social transformation of the individual at death (Hertz [1907] 1960). Acknowledging the role of the mourners and the social actions that took place during the burial rites allows for a nuanced understanding of the mortuary record (Hodder 1982;

Parker Pearson 1993). In this study, we view funeral rites as a form of public performance, where socially constructed gender relations are reflected in mortuary treatments but created through social practice (Damm 1990:130; Díaz-Andeu 2005:39; Sørensen 2000:92-93).

From this perspective, we acknowledge that grave goods are placed within the tomb by the mourners participating in burial rites, but in the Andes these objects were also likely those used during life by the deceased (e.g. Ackerman 1991; Cieza de León [1554] 2010:117; Cobo [1653] 1990: 250). For example, in Abancay, Peru, during the funerary ritual the body is dressed in their clothes from life and in a manner reflecting their own stylistic preferences (Ackerman 1991:243). During the Inka period, Cobo describes a similar practice of dressing Inka elites in their clothing and assembling objects used during life ([1653] 1990: 250). Archaeologically, numerous studies of Andean textiles have noted wear on the dead's clothing (Cassman 2000; Minkes 2005; Oakland Rodman 1992), suggesting that they had been worn during life by the decedent.

This contextual information about Andean funerary practices suggests that grave goods can be used to infer information about the lives of the dead, although the dead are ultimately gendered by the living because mourners select the objects placed within tombs. It is the perception of an individual's gender identity reflected in the graves of the dead, not necessarily the actual manner in which these aspects manifested in individual lives. In this way, "the grave does not simply reflect the gender of the deceased, as its construction is also about the gender understandings of the living" (Sofaer Derevenski 2002:196). Variations present in the mortuary record reflect variations that are deemed socially appropriate by those participating in the act of burial. Thus, at the individual level of gender identity, we are viewing the socially perceived and acceptable

manifestation of gender identity. In aggregate, these gender associations of artifacts reflect gender roles in Chiribaya society.



Figure 8. Map showing the location of Chiribaya Alta in Southern Peru.

### **The Chiribaya *Señorío* of Southern Peru**

The Ilo Chiribaya polity is a Late Intermediate Period culture centered in the lower Osmore drainage, near the modern port city of Ilo, Peru (Figure 8; Buikstra 1995; Jessup 1990). This archaeological culture was first defined by Ghersi Barrera (1956) after he conducted limited excavations at the site now known as Chiribaya Alta.

Manifestations of this culture are not limited to the Ilo valley, however, as Chiribaya artifacts have been identified throughout the coastal south-central Andes, extending from the Tambo Valley in the southern Arequipa region to the Azapa Valley, located in northern Chile (Belan Franco 1981; Focacci 1990; Jessup 1991; Kolomanski 2016; Krajewska 2016; Muñoz Ovalle and Focacci A. 1985). During the late 1980s and early

1990s, Proyecto Chiribaya led by bioarcheologist Jane Buikstra excavated four Chiribaya-affiliated sites within the Osmore drainage: Chiribaya Alta, Chiribaya Baja, San Geronimo, and Yaral (Buikstra 1995).

Archaeological evidence suggests that the Ilo Chiribaya formed a *señorío*, which is an Andean coastal chiefdom consisting of multiple occupational specialists (Buikstra et al. 2005; Lozada and Buikstra 2002, 2005). Ethnohistoric documents from the post-contact Peruvian coast describe classes of occupational specialists including fishermen, farmers, merchants, and artisans (Rostworowski 1977; 1978). Thus, *señoríos* follow a horizontal model of resource procurement, split between maritime and terrestrial sources rather than the vertical model usually emphasized in the Andes (Murra 1985; Rostworowski 1970; Tomczak 2003). Andean ethnohistory suggests that occupational communities within *señoríos* lived in separate settlements and traded between themselves to obtain the resources they needed (Rostworowski 1977). Chiribaya occupational specialists consist of fishermen (*pescadores*) and farmers (*labradores*) who lived in different locales within the *señorío* (Buikstra et al. 2005; Lozada and Buikstra 2005). These two groups marked their community identity through cranial modification (Lozada 2011; Lozada and Buikstra 2005), diet (Tomczak 2003), ceramic styles (Jessup 1990), and textile iconography (Schach and Buikstra n.d.).

### ***Chiribaya Alta***

Chiribaya Alta is the largest, most complex Chiribaya-affiliated site excavated to date in southern Peru (Figure 9; Buikstra 1995). The site is located approximately 5 km from the ocean and is perched on a high mesa overlooking the lower Osmore River. This location is near both agro-pastoral and maritime activities, and both *pescador* and

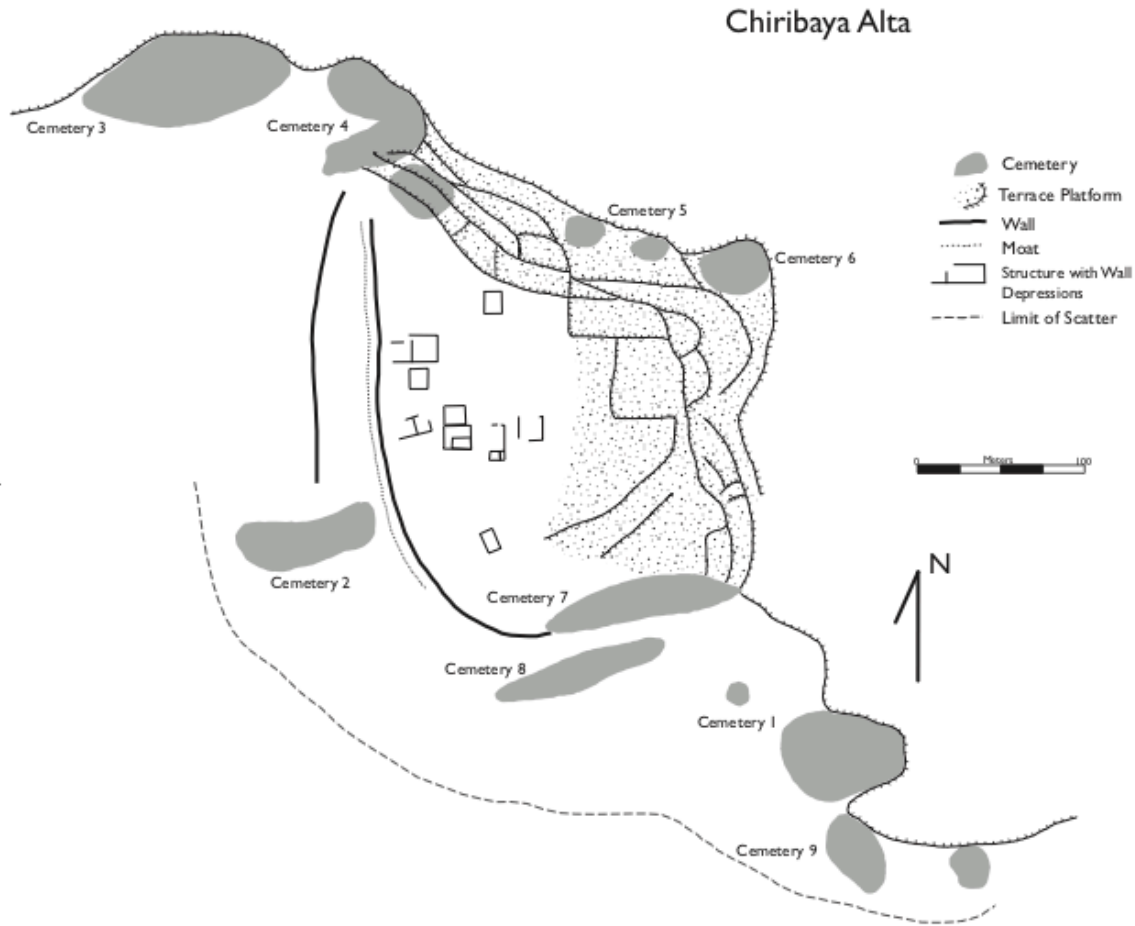


Figure 9. Site map of Chiribaya Alta

*labrador* occupational groups are buried at the site (Buikstra et al. 2005; Lozada 2011; Lozada and Buikstra 2002, 2005). Chiribaya Alta is bordered by terraces facing the valley and a wall and moat, a later construction, facing the pampa plains (Buikstra et al. 2005). Excavations at Chiribaya Alta have yielded 307 tombs from nine formally bounded cemeteries. Radiocarbon dates from human skeletal remains on average range from between 775 to 1100 CE (Buikstra et al. 2005).

Although both occupational groups are present at Chiribaya Alta, most bioarchaeological studies, especially those of diet and cranial modification, have not found gendered differences at the site (Indriati and Buikstra 2001; Knudson et al. 2007;

Lozada 2011; Tomczak 2003). For example, while cranial modification does appear to indicate occupational identity within the Chiribaya *señorío*, it is not variable between males and females (Lozada 2011). An intra-site biodistance study of metric craniofacial traits however, does indicate that in two cemeteries at Chiribaya Alta, four and seven, males have significantly more variation than females (Nystrom and Malcom 2010). This suggests that individuals from these two cemeteries practiced matrilineal post-marital residence patterns, where males are the mobile sex after marriage, reflected through their increased phenotypic variability.

Artifact Class	Female % Present	Male % Present	Significant P-value
Bowl	53.4	54.9	
Cup	1.4	39	
Water Container	15.1	23.5	
Cooking Pot	2.7	0	
<i>Kero</i>	4.1	25.5	0.006
Pitcher	42.5	33.3	
Wooden Spoon	42.5	43.1	
Basket	31.5	33.3	
Textile Bag	26	37.3	
Corn	27.4	21.6	
Musical Instrument	1.4	15.7	0.04
Guinea Pig	20.6	15.7	
Miniature Boat	15.1	19.6	
Gourd	43.8	43.1	
Textile Tool	34.3	3.9	<0.0001

Table 2. Differences in artifact frequencies between males and females buried at Chiribaya Alta, from Lozada and Rakita (2013)

Grave goods, however, do appear to be distributed differently between (biological) males and females at Chiribaya Alta (Buikstra 1995; Lozada and Rakita 2013). Lozada and Rakita (2013) found differences in the frequencies of certain artifact

classes in the graves of males and females at Chiribaya Alta (Table 2). They classified artifacts into fifteen categories and recorded the presence of each type. This was a univariate analysis, as counts of artifacts were tested for statistical significance between male and female graves using Fisher's Exact Test. The analysis by Lozada and Rakita found that tools for making textiles were significantly associated with females, whereas *keros* (beer drinking vessels) and musical instruments were associated with males. None of these items, however, were found exclusively with each sex and, due to the nature of univariate analyses, unsexed graves were not included in the analysis.

### **Multivariate Approaches to Mortuary Analysis**

The above univariate analyses at Chiribaya Alta suggest that differences in artifact frequencies are present between the graves of males and females. Our study of gender at Chiribaya Alta uses a multivariate technique and builds upon the earlier analysis by Rakita and Lozada (2013). In this section, we argue that univariate analyses of gender are limited in their approach to archaeological gender because they, (1) exclude individuals for which sex could not be estimated with accuracy and (2) presume a binary gender system. Here we will discuss each of these limitations in more depth.

Univariate mortuary analyses of gender in archaeological contexts often limit their sample to skeletally sexed individuals or tabulate the results for individuals of unknown sex without considering the data these graves provide (e.g. Clayton 2010; Lozada and Rakita 2013; Savage 2000; Stalsberg 2001)., This reduces the sample of individuals available to the researcher. Primarily, bioarchaeologists are limited in their ability to estimate the sex of skeletal individuals by the preservation and age of individuals. In our case, skeletal preservation at Chiribaya Alta is generally excellent but looting in antiquity and modernity has caused the destruction of skeletal materials.



Evidence of looting marks the surface of Chiribaya Alta and fragments some mortuary contexts (figure 10).



Figure 10. Satellite view of Chiribaya Alta showing evidence of looting.

A second limiting factor in skeletal sex estimation is the age of individuals. Current osteological methods cannot accurately estimate the sex of most juvenile individuals (Cunningham et al. 2016; Komar and Buikstra 2008). The number of juvenile tombs at mortuary sites can make up a sizeable portion of the sample, which is especially true at Chiribaya Alta where juvenile tombs comprise 49.5% of the sample. Indicators of skeletal sex in the bony pelvis develop during puberty, which usually occurs earlier in females than males (Cunningham et al. 2016). As such, studies of skeletal sex estimation have found that sex assessment can be accurately completed earlier for females than



males (Klales and Burns 2017; Sutherland and Suchey 1991). Unfortunately, individuals of these ages represent relatively little of the juvenile sample from Chiribaya Alta and other archaeological sites, because the risk of juvenile death is greatest for individuals less than five years old (Weiss 1973). Therefore, juvenile skeletal remains represent a large proportion of mortuary samples, but we are unable to assess their sex, which causes their exclusion from most archaeological gender studies. This exclusion reflects a modern assumption that children do not have gender identities or roles.

Univariate analyses of gender also presume that the sexes and their related gendered expressions exist as binary opposites (Stratton 2016) because these univariate analyses only define statistically significant differences between the sexes and associate artifact types with skeletally sexed bodies. Thus, in order to reach statistical significance, artifact frequencies must be different between these two groups; the possibility of non-binary sex and gender systems are not considered. Stratton (2016) effectively demonstrates the difference between univariate and multivariate analyses in her analysis of gender at Durankulak, where results do not indicate a strict sex/gender binary when a multivariate approach is employed. Therefore, univariate gender analyses presume binary opposition because researchers are only testing for differences between males and females; a binary conclusion is inevitable.

### **Method: Multiple Correspondence Analysis**

We believe that archaeological approaches to gender are better served by using multivariate statistical analyses, which address the limitations discussed above. Here we will discuss the manner in which one method in particular, multiple correspondence analysis (MCA), can be used to analyze archaeological gender. This technique addresses many of the limitations of univariate analyses of gender. A gender binary is not

presumed, since the MCA does not require the inclusion of sex information in the analysis. Instead, burials are grouped based on the similarity of their mortuary assemblages. It is only after the MCA that skeletal sex information is used to interpret the results of the MCA. Furthermore, MCA, as used here, includes unsexed individuals from the burial assemblage, and thus the analysis is not limited to sexed burials.

Multiple correspondence analysis (MCA) is an extension of correspondence analysis applied three or more categorical variables (Everitt and Dunn 2001; Greenacre 2017; Husson et al. 2017). Instead of using contingency tables, as in correspondence analysis, MCA analyzes tables wherein rows are individual responses and columns represent variable responses (Husson et al. 2017). MCA is frequently applied to survey data in the social sciences (Husson et al. 2017), but here we apply it to the presence and absence of artifacts in graves at Chiribaya Alta.

Functionally, MCA behaves similarly to a principal component analysis (PCA) of categorical data in that it describes the underlying relationships between multiple unrelated variables (Everitt and Dunn 2001; Husson et al. 2017). MCA also uses eigenvalues to reflect the percent of variance explained by the factors in analysis. Unlike PCA, the eigenvalue for the first factor is under-estimated in MCA, because it creates artificial additional dimensions, where one variable is coded in several columns (Greenacre 2017: 144). Nevertheless, the first and second factor of the analysis explain more variation than the other factors in MCA.

One of the advantages of using a multivariate statistical technique is the ability to include supplementary variables to aid interpretation. In our analysis sex information is included as a supplementary variable, which means that it is not included in the initial

MCA. Thus, the relationships between variables are not influenced by individual skeletal sex assessments, but these data are used after the analysis to aid in gender interpretations.

## **Materials**

The Chiribaya Alta collection is housed in El Algarrobal, Peru at Centro Mallqui and sex assessments were completed using standard methods (Buikstra and Ubelaker 1994; Phenice 1969; Walker 2005). The mortuary dataset was constructed using records from the 1989 and 1990 excavations at Chiribaya Alta. The presence of artifacts was also checked against an artifact inventory provided by Centro Mallqui. Artifacts not recorded in the initial excavation forms tended to be small objects, such as spindle whorls, miniature boats, and textile items. These objects were likely placed within Chiribaya mummy bundles (Clark et al. 1993) and thus invisible at the time of excavation. Therefore, they are not recorded on the excavation forms.

Chiribaya Alta is a heavily disturbed site, as looting is common throughout the Ilo area (Jessup 1991; Zaro et al. 2010). To minimize the effects of looting on the multivariate analysis, we converted counts to presence and absence data. This is appropriate because we are primarily interested in the relationship between individuals and artifact types, not in the number of artifacts included in the grave. We also removed individuals whose burials contained fewer than two kinds of artifacts, which resulted in the removal of approximately a third of the 305 tombs, to 195 individuals total.

We also removed Tomb 419 in cemetery 4, as an outlier because it is the most elaborate grave at Chiribaya Alta and contains multiple individuals (Buikstra et al. 2005; Lozada and Buikstra 2005). It is a large 3.5 x 0.6 meter tomb containing three individuals, two females and one male. These individuals were buried with 137 grave goods, including textile bags, kerchiefs, ceramics, camelid skulls, guinea pigs, weaving

tools, gourds, spoons, *keros*, entire birds, and more. Thus, Chiribaya Alta tomb 419 was removed from the dataset used in this study because it does not reflect normal mortuary practice at Chiribaya Alta.

The Chiribaya Alta mortuary dataset includes 195 individuals. These data include forty-five biological females, forty biological males, and one hundred ten individuals without a skeletal sex estimate. The dataset records presence and absence data for fifteen types of artifacts, including harpoons, miniature boats, textile bags, gourds, camelid remains, water jugs, baskets, wooden spoons, bowls, guinea pigs, pitchers, *keros* (beer cups), textile kerchiefs (*pañuelos*), musical instruments, and weaving tools. Other types of artifacts occurred too infrequently for inclusion in the MCA.

## Results

Multiple Correspondence Analysis (MCA) of the Chiribaya mortuary database was performed in R using the FactomineR package (Lê 2008; Husson et al. 2017). Skeletal sex was included as a supplementary variable. Thus, sex information will guide our interpretations of the Chiribaya mortuary MCA, but this variable was not included in the MCA calculations determining the results for individuals and artifact classes.

	Eigenvalue	% of Variance	Cumulative % of Variance
Dimension 1	0.1885	18.8474	18.8474
Dimension 2	0.1000	9.9960	28.8433
Dimension 3	0.0857	8.5719	37.4152
Dimension 4	0.0792	7.9164	45.3316
Dimension 5	0.0720	7.2008	52.5324

Table 3. Eigenvalues for the first five dimensions of the MCA.

The results of the MCA indicate that the percent of variance explained by the first and second dimension is low (28.85%), with 18.85% for dimension 1 and 10.00% for dimension 2 (Table 3). But eigenvalues in MCA are always artificially low and

	Dim 1	Dim 2
Harpoon_No	-0.1144	-0.0442
Harpoon_Yes	0.8553	0.3309
Miniature.Boat_No	-0.26	-0.0814
Miniature.Boat_Yes	0.585	0.1831
Textile.Bag_No	-0.1331	-0.4921
Textile.Bag_Yes	0.1758	0.6503
Gourd_No	-0.5876	-0.1483
Gourd_Yes	0.4354	0.1099
Camelid_No	-0.5262	-0.0928
Camelid_Yes	0.5654	0.0997
Water.Jug_No	-0.3372	0.0382
Water.Jug_Yes	1.192	-0.1349
Basket_No	-0.4684	0.0823
Basket_Yes	0.7659	-0.1345
Spoon_No	-0.5635	0.3322
Spoon_Yes	0.3372	-0.1988
Bowl_No	-0.7889	-0.0039
Bowl_Yes	0.3021	0.0015
Guinea.Pig_No	-0.2645	-3.00E-04
Guinea.Pig_Yes	0.6732	8.00E-04
Pitcher_No	-0.4692	0.358
Pitcher_Yes	0.4939	-0.3768
Kero_No	-0.2	-0.1201
Kero_Yes	1.2999	0.7806
Textile.Kerchief_No	-0.0478	0.3371
Textile.Kerchief_Yes	0.1387	-0.9776
Musical.Instrument_No	-0.1059	-0.0757
Musical.Instrument_Yes	1.1088	0.7924
Weaving.Tool_No	-0.0992	0.4872
Weaving.Tool_Yes	0.1772	-0.8701

Table 4. Variable factor loading scores

underestimate the quality of the analysis (Greenacre 2017:144). Thus, we focus on these two factors for our interpretation of Chiribaya gender.



pañuelos (textile kerchief). Testing the significance of these factors against the supplementary qualitative variable sex, we see that males are significantly associated with a positive loading on factor 2, while females are significantly associated with a negative loading on factor 2. These data suggest that overall gender roles are expressed in the Chiribaya Alta mortuary dataset.

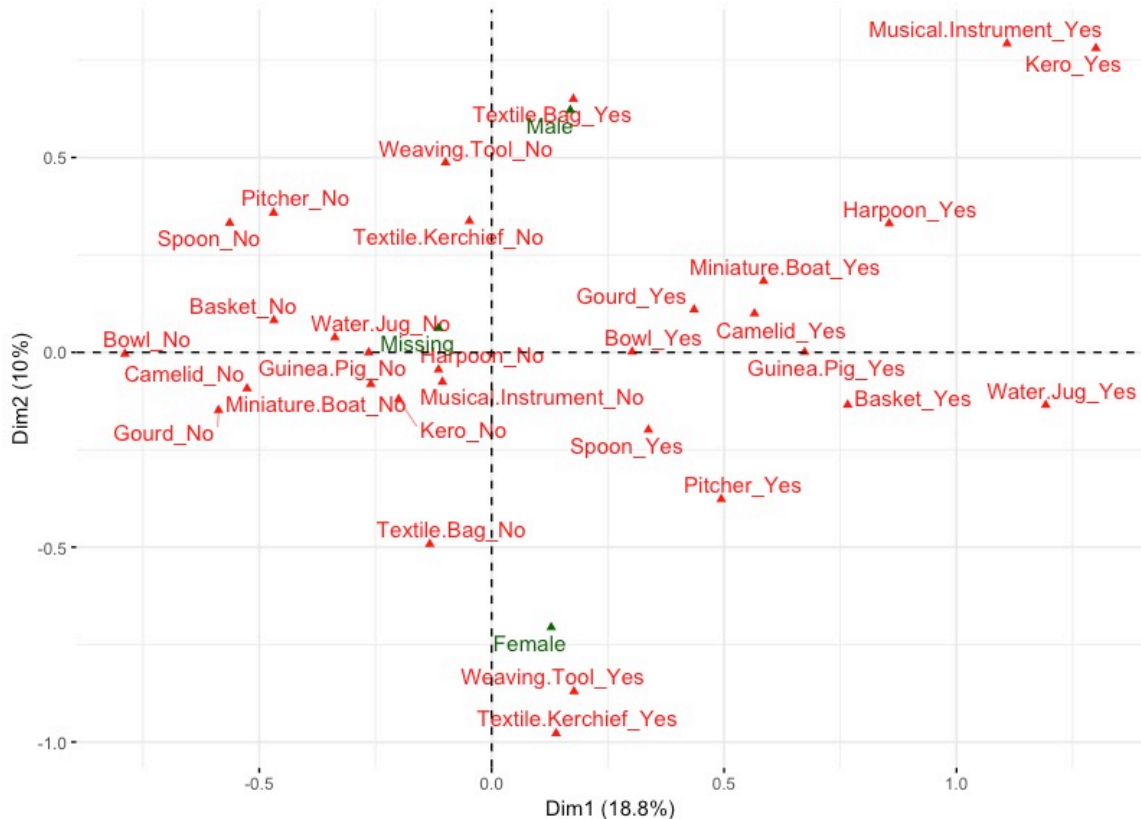


Figure 12. Variable biplot

This pattern suggests that gendered expressions tends to follow a binary structure, with certain objects associated with males and females., which is expressed in the biplot showing the location of the supplementary categorical variable sex in the cloud of individuals (Figure 13). We can see that in the cloud of individuals, males tend to have positive loading on factor 2, while females tend to have negative loading on factor 2. The

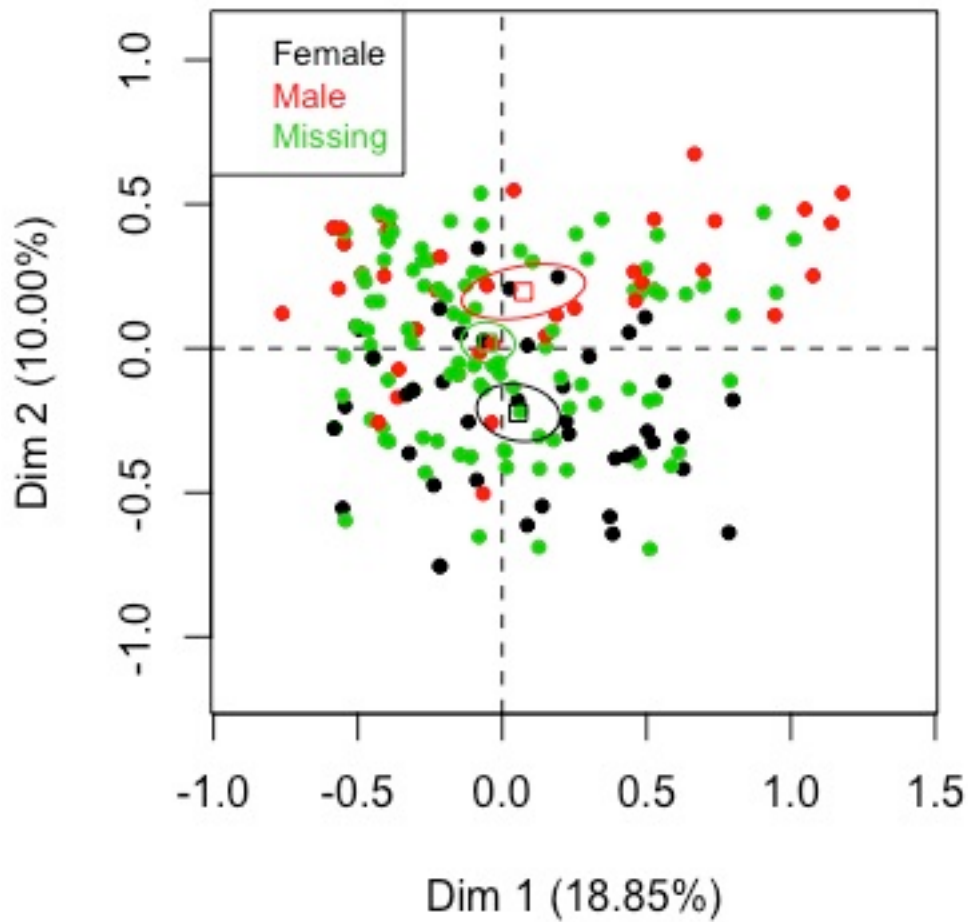


Figure 6. Supplementary sex biplot with confidence ellipses around sex

supplementary categorical variable of sex is represented on the biplot and reflects the average of all individuals possessing that variable. Thus, this point is a representation of the mean individual value for that sex. The confidence ellipses show that the mean female individual does not overlap with the mean male individual. The variable for those individuals missing sex data is between the values for males and females reflecting the mixed composition of this group. These results suggest that on average, the graves of males and females are significantly different across the second factor.



While these results suggest a binary set of normative gender roles, we can see from the cloud of individuals that there is variety in the expression of gender identity across the second factor. It is also clear from the biplot that gendered expression is not exclusive. Seven males have negative loadings on the second factor, and eleven females have positive loadings on the second factor, which indicate that individuals are able to express non-normative elements of gender identity in their burial contexts. For example, tomb 746 is for a female but maps with male burials on the biplot, with a second factor coordinate of 0.1079. This burial contains artifacts that are associated with both males and females, including a textile bag, textile kerchief, *kero*, and weaving tools. Variability in gender identity is not limited to females. For example, the individual in tomb 246 is a male but plots with female burials and is buried with a textile bag, textile kerchief, and weaving tool. Thus, both of these tombs reflect a combination of normative gender roles and individual expression in gender identity.

A full table of those items buried with individuals who do not map with their expected sex is provided (Table 5). These individuals suggest that in practice there is flexibility in expression of gender identity in burials at Chiribaya Alta, rather than strict adherence to normative gender roles. Thus, there was not a single way to express gender in Chiribaya mortuary contexts. The binary gender roles suggested by the second factor is variable in practice as seen through gender identity.

## **Discussion**

The results of the multiple correspondence analysis of graves at Chiribaya Alta has important implications for our understanding of the gender roles and identity of those individuals buried at the site. It is clear based on the MCA that there is an association between artifact loadings on the second dimension and gender. These associations reflect

Tomb	Sex	Textile Bag	Kero	Textile Kerchief	Musical Instrument	Weaving Tool	Dim 1	Dim 2
719	Male	X		X		X	-0.0662	-0.5032
246	Male	X		X		X	-0.0371	-0.2572
902	Male			X			-0.4289	-0.2562
11	Male					X	-0.363	-0.1699
318	Male						-0.1517	-0.0898
103	Male	X		X			-0.3586	-0.0725
3	Male					X	-0.0788	-0.0153
720	Female	X				X	0.0874	0.0106
240	Female						-0.0648	0.0286
743	Female						-0.1451	0.0515
722	Female	X		X	X		0.4396	0.0555
212	Female						-0.4945	0.0653
249	Female	X					-0.5052	0.0773
746	Female	X	X	X		X	0.4955	0.1079
302	Female				X	X	-0.2171	0.138
607	Female	X					0.0255	0.2068
310	Female	X					-0.0846	0.3466

Table 5. Individual table

normative Chiribaya gender roles. At Chiribaya Alta, female burials are associated with textile production and carrying coca in *pañuelos*, while male burials are associated with public beer consumption, carrying coca in *chuspas*, and the playing of musical instruments. When looking at the results of this analysis, it initially appears that there are normative gender roles in place based on binary opposition. Upon further study, however, we see a more nuanced perspective. This is not unexpected because, as we noted earlier, there is modern Andean ethnographic evidence for complex individual assignments of blurred gender roles. Here, we will discuss our Chiribaya artifact associations in more depth using contextual information from ethnographic, ethnohistoric, and archaeological sources, first considering the well-known Andean evidence for gender complementarity.

The concept of gender complementarity has been widely adopted as a model of gender ideology and relations in the modern Andes (Allen 1988; Canessa 2005; Harris 1978; Harvey 1994). Gender complementarity challenges the idea that genders always exist in a form of hierarchy, where men are ranked above women (Gero and Scattolin 2002). The Aymara word and concept of *chachawarmi* refers to the household, consisting of one woman and one man, as a single unit. Within Aymara society, individuals can only become full social actors once they have formed *chachawarmi*. The word itself is the combination of the words for man (*chacha*) and woman (*warmi*). Harris (1978) first described the concept of *chachawarmi* among the Laymis, a Bolivian Aymara group living north of Potosi. Within this gender framework, both genders must participate in different parts of a task to complete the task overall. For example, both men and women participate in agricultural crop production, as men hoe the land and women plant the seeds (Harris 1978). Chronicler Guaman Poma ([1613] 2009), illustrated a similar practice among the Inka, with men and women working to plant potatoes and tubers, where the man is digging, and a woman is planting the seed potato.

It is important to note that in our discussion of gender complementarity, we do not intend to minimize the variation present in expression of gender identity, a critique of earlier approaches to this concept (Gero and Scattolin 2002; Stockett 2005). Instead, we discuss gender complementarity as reflected in the gender roles adopted in Chiribaya society, as an overall framework that can be differentially manifested in individual lives through gender identity. Here, we will illustrate how the gender roles suggested in the MCA reflect certain activities and suggest elements of gender complementarity in Chiribaya society.

At Chiribaya Alta, the presence of musical instruments in tombs has a positive loading along the second factor. The association of musical instruments with male burials in the MCA suggests that the playing of musical instruments is a masculine gender role. This result is consistent with that of Lozada and Rakita (2013:119), who found a significant difference between the frequency of musical instruments buried with males compared to females (15.7% vs. 1.4%) at Chiribaya Alta. Here we review archaeological and ethnographic information related to musical performance in the Andes.

Musical instruments have been recovered from many Andean archaeological sites, but little has been written regarding their gendered associations (Alva and Donnan 1993; Chacama Rodríguez and Díaz Araya 2011; Focacci 1990; Ghezzi and Ruggles 2007; Janusek 1999; Sánchez Huaranga 2015). The ethnohistoric chronicler Guaman Poma ([1613] 2009) does not explicitly describe musical instruments as the domain of men but provides multiple depictions of men playing instruments during the Inka period. Similarly, modern ethnographic data from the Andes associates men with the playing of musical instruments (Arnold and Yapita 2001; Harris 1980; Romero 2001; Stobart 2002, 2008; Zorn 1986). In these ethnographies however, men play musical instruments and women sing, which suggests gender complementarity in the production of music. For example, Stobart (2002:88) describes how a young Bolivian man demonstrating music with his *charango*—an Andean string instrument—apologized that it was incomplete without a woman’s voice. Thus, we cannot assume that Chiribaya women were not involved in musical performances, but if they were it is likely that primarily participated in this activity through singing.

*Keros* also have positive loadings along the second factor, and thus have a masculine gendered association. This result is also consistent with the results of Lozada

and Rakita (2013) who report that 4.1% of females were buried with *keros*, while 25.5% of males were buried with this item, a significant difference. Within Chiribaya contexts, *keros* are tall vase-shaped ceramic or wooden vessels that often have a zoomorphic projection at the rim (Jessup 1990; Umire and Miranda 2001:29).

In the modern Andes, *keros* are associated with public *chicha* consumption and ritual (Allen 2002: 115). Guaman Poma and other ethnohistoric chroniclers depict these vessels as important means for the public consumption of *chicha*—Andean corn beer—in Inka rituals (Cobo 1979; Guaman Poma [1613] 2009). It is clear that colonial processes under the Spanish impacted these rituals and the decoration of *keros* (Cummins 2002), but there is apparent archaeological time depth to these practices as well. *Keros* and other indicators of *chicha* production have been found at numerous archaeological sites in the Moquegua valley (Goldstein 2003; Moseley et al. 2005). While we cannot be certain that *keros* were the only vessels involved in the consumption of *chicha* in the archaeological past, evidence from chroniclers does indicate that they were in use for that purpose in the pre-contact Andes.

In the modern Andes, the public consumption of *chicha* during rituals is often broadly associated with men (Jennings and Bowser 2009). A closer look at ethnographic literature however, reveals that there are many Andean localities where women consume *chicha* alongside men (Allen 2002:115; Harvey 1994; Tschopick 1946). Thus, the association of *keros* with males does not mean that women were not involved with *chicha* in Chiribaya society. Furthermore, numerous modern and ethnohistoric sources describe women as the primary producers of *chicha* and are usually expected to serve their brew (Cieza de Leon [1554] 2010; Hames 2003; Hayashida 2009; Jennings and Bowser 2009; Perlov 2009; Silverblatt 1978, 1987; Tschopik 1946; Weismantel 2009). During the Inka

period, for example, sequestered women known as *mamakuna* or *aqlla* made large quantities of *chicha* for public festivals (Cieza de Leon [1554] 2010; Cobo [1653] 1990; Costin 1993; D'Altroy 1992:100). This pattern of female production is not universal within the Andes however, as Rostworowski (1977) does describe communities on the coast where groups of men were in charge of making and selling *chicha*.

Some archaeological studies have suggested that *chicha* consumption was increased amongst males, primarily through isotopic comparisons between males and females, where males are consuming more C4 resources, consisting primarily of corn (Hastorf 1991; Somerville et al. 2015). Isotopic analyses of individuals buried at Chiribaya Alta however, do not indicate differences between male and female C4 plant consumption (Tomczak 2003). These data suggest that there was little differentiation in *chicha* consumption between males and females buried at Chiribaya Alta. Furthermore, we argue that it is possible that both genders were required to work toward the completion of rituals involving *chicha*, with women making and serving the *chicha* and men publicly consuming the brew.

In contrast to the artifacts discussed above, weaving tools are commonly buried with females and have a negative loading on the second factor. This result is comparable to Lozada and Rakita (2013:119) who reported a significant difference of textile tool frequencies with 34.3% of female graves and 3.9% of male graves containing these items. Chiribaya individuals used a variety of items for textile production including *pushkas* (drop spindles), *wichuñas* (a bone tool used to separate the warp threads while weaving), *peines* (combs for carding fiber), and *aguja* (needles).

Ethnographically, textile production is a task associated with women in the modern Andes (Arnold and Yapita 2001; Allen 1988; Bolin 2006; Crickmay 2002;

Franquemont and Franquemont 1987; Medlin 1986; Seibold 1992, 1995; Zorn 1992). Andean textiles are produced through process that involves the spinning and dyeing of yarns, weaving textile fabrics, and finishing seams and decorations (Goodell 1969; Franquemont and Franquemont 1987; Rowe 1975). Zorn (1992) describes this process as a 'daily obsession' amongst weavers on Taquille Island in Lake Titicaca, because it takes up so much of women's time. This association has apparent time depth, as Inka ethnohistoric sources depict weaving as a feminine gender role (Cobo [1653] 1990; Guaman Poma [1613] 2009; Murra 1962; Silverblatt 1978). For example, in Guaman Poma's ([1613] 2009: 211-223) description of the Inka census, he lists weaving and spinning as an important women's role.

Despite these strong associations, however, in various Andean locales men also participate in cloth production (Allen 1988; Crickmay 2002:50; Harris 1978). There is ethnohistoric documentation that a certain class of men, known as *qompikamayo*, were involved in cloth production within the Inka empire (Cobo [1653] 1990:225 ; Costin 1998). When men participate in cloth production they usually make different items than women, for example in Macusani, and other highland locales in Peru, only men spin the yarn for and braid the slings used in camelid herding (Arnold and Yapita 2001; Cahlander 1980; Zorn 1980-1981). Similarly, In Laymi, Bolivia, men produce plain weave cloth using a European harness loom, in contrast to the warp-faced cloth produced by women (Harris 1978). Both men and women need these types of fabric to form a complete wardrobe and thus, this division of textile production tasks reflects complementary gender roles (Harris 1978). Based on this ethnographic information, textile production is generally a feminine gender role in the Andes, but men often participate in ways that are appropriate for their gender identity.

Our final artifact discussion relating normative gender roles considers the use of coca, reflected in the inclusion of *chuspas* (textile bags) and *pañuelos* (textile kerchiefs) in graves at Chiribaya Alta. These two textile objects—*chuspas* and *pañuelos*—have positive and negative loadings respectively, indicating that bags are associated with males and kerchiefs with females. The univariate analysis of gender at Chiribaya Alta by Lozada and Rakita (2013) did not include *pañuelos* and did not find a significant difference between male and female graves with textile bags. Both of these objects are associated with the transportation of coca in the modern Andes (Sharratt 2014; Zorn 1986), which is confirmed for burials at Chiribaya Alta by the presence of coca leaves held within both the objects. Here, we will discuss what the differential association of these objects with men and women indicates about Chiribaya coca ritual and gender relations.

Textile bags, also known as *chuspas*, are and have been used to carry coca throughout the Andes (Finley Hughes 2010; Horta and Agüero 1997; Martin 1970; Sharratt 2014). Chiribaya *chuspas* are usually brightly colored bags woven with warp stripes and three stripes of iconography (Horta 1997; Horta and Agüero 1997; Schach and Buikstra n.d.). At Chiribaya Alta *chuspas* are associated with male burials, which is consistent with ethnographic data from some locales in the Peruvian highlands where *chuspas* are also associated with men (Bastien 1978; Medlin 1987; Zorn 1986, 2004). It should be noted, that this is not universally true throughout the Andes as in many communities, women also use *chuspas* (Femenías 2005; Ortega Perrier 2016; Presta 2010; Sharratt 2014).

Similarly, textile kerchiefs, referred to as *pañuelos* in Spanish and *unqhuna* in Quechua and Aymara, serve many purposes in the Andes, although their primary purpose



according to ethnographic literature is to carry coca and other ritual bundles (Femenías 2005; Heckman 2003; Zorn 1987). Textile kerchiefs buried at Chiribaya Alta are rectangular in shape and have stripes formed by varying the color of the warp. In the mortuary offerings at Chiribaya Alta, many of these kerchiefs were tied to carry coca leaves, left as offerings with the dead. The association of these objects with female burials is an interesting indication that when participating in coca ritual, women are more likely to carry their coca in tied kerchiefs rather than bags. This pattern is similar to that reported ethnographically in some Andean locales (Medlin 1987; Sharratt 2014).

Both of these objects relate to the use of coca and suggest that Chiribaya men and women participate in coca chewing using different containers. The association of *chuspas* with men and *pañuelos* with women is not unheard of in the Andes (Medlin 1987; Sharratt 2014). For example, Sharratt (2014) notes that in some villages in the upper Moquegua valley, women carry their coca in *pañuelos*, while men prefer to use *chuspas*. Considering that Chiribaya Alta is located in the lower Moquegua valley, the proximity of this locale is intriguing.

Based on the association of textile goods, it is likely that both men and women were participating in Chiribaya coca ritual. Bioarchaeological evidence from Chiribaya Alta and other Chiribaya-affiliated sites confirms that both men and women chewed coca in Chiribaya society (Cartmell et al. 1991, 1994; Indriati and Buikstra 2001). Coca chewing was also a frequent occurrence, as hair and nail tests for the benzoylecgonine (BZE) metabolite of coca in Chiribaya mummies shows high use within the Chiribaya polity during the last year of life for individuals tested (Cartmell et al. 1994). Based on these BZE tests, there is no statistical differences in use between males and females from Chiribaya sites in Azapa and Ilo (Cartmell et al. 1994:91). Bioarchaeological dental

analyses have also been performed on sample of individuals from Chiribaya Alta, which reflect long term cumulative coca use (Indriati and Buikstra 2001). These analyses suggest a similar rate of coca use as hair tests, with 42% (11/26) of individuals showing strong indicators of coca use and similarly, dental pathologies did not indicate different use rates between men and women buried at Chiribaya Alta. These results indicate that while both men and women were equally using coca and likely participating in related coca chewing rituals, they were doing so using different textile containers which signal their gender identity.

### ***Gender Identity***

Gender identity is also expressed in the graves at Chiribaya Alta beyond those of normative gender roles. While many individuals express normative gender roles and identity in their graves, there are 17 individuals (Table 4) who plot with the other sex based on their second factor loadings. Here we will expand our discussion of these individuals and the implications their burials have for understanding gender identity at Chiribaya Alta.

There are ten females with positive loadings on the second factor. Of these individuals, four have objects associated with feminine gender roles, three with weaving tools and two with textile kerchiefs. In terms of textile objects, these six out of ten of these females have textile bags, one of whom also have *pañuelos*. There are a variety of masculine objects buried with these individuals. Musical instruments were buried with 2 of the females, and one was buried with a *kero*. These objects indicate that females were able to take on a variety of roles associated with men and express that as part of their gender identity.

Seven males have negative loadings and plot with females on the second factor of the MCA. The interesting thing about these burials is that none of the men are buried with the two artifacts associated with masculine gender roles, but three of these males are buried with textile bags. Four of the seven men, however, are buried with objects related to textile production. Furthermore, three of the males with textile bags also have textile kerchiefs.

It appears that flexibility in gender identity operates differently for males and females in mortuary contexts at Chiribaya Alta. Males expressing feminine roles appear to be involved in textile production with few objects relating to other masculine roles. Females buried with objects related to masculine gender roles according to the MCA appear to have a different pattern. Two of the females who are buried with objects relating to male roles, including *keros* and musical instruments are also buried with weaving tools. Therefore, in the case of some non-normative female graves at Chiribaya Alta, women are expressing a normative and non-normative gender identity where they are associated with both masculine and feminine grave goods. It is through their repeated performance of gendered acts associated with these items that they are able to reinforce and subvert normative gender identities.

Considering the Andean ethnographic and ethnohistoric reports that describe elements of variability and flexibility in the performance of gendered tasks, it is not surprising to see similar evidence from Chiribaya Alta. Individuals expressing non-normative gendered expressions and identities appear to be accepted in Andean ethnography. For example, in her ethnography from the Peruvian highlands, Allen writes:

Each man or woman is a complete individual; each of them possesses and used both hands and feet, has a left and right side, and can occupy horizontal or vertical

postures. In other words, every woman possesses male qualities and vice versa; the problem is not to exclude these attributes of the other sex, but to express them in a suitable way. Thus, a man should express his female aspect in a properly masculine manner; a woman should express her male aspect in a feminine manner [Allen 1988:83].

This well fits our results from Chiribaya Alta as there does appear to be a degree of fluidity in the performance of gendered tasks. Since individuals are regarded as having both feminine and masculine elements, they can differently emphasize them in appropriate ways.

### **Conclusion**

Gender is expressed in the Chiribaya Alta mortuary set. While normative Chiribaya gender roles are similar to those in the ethnographic, ethnohistorical, and archaeological Andes, individual gender identity can be flexible. This is represented by the presence of male and female burials with grave goods associated with the other gender. The kinds of grave goods and the overall assemblage of these burials suggests that flexibility in gender expression occurs in socially sanctioned ways. Furthermore, in the case of coca bags, the ritual activity performed by Chiribaya individuals is not different, but men and women carry their ritual goods using gendered containers.

These analyses suggest that multiple correspondence analysis is appropriate for addressing the relationship between gender roles and individual gender identity. In the Chiribaya case study, these methods confirmed most of the gender roles suggested by univariate frequency counts of male and female artifacts by Lozada and Rakita (2013). But it is also clear that by using a multivariate technique that we are able to identify flexibility in individual expression of gender identity.

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CHAPTER 4  
THE GENDERED ELDERLY AT CHIRIBAYA ALTA: AN INTERSECTIONAL  
APPROACH COMBINING MORTUARY ANALYSIS AND AGE-AT-DEATH  
ESTIMATION USING TRANSITION ANALYSIS

The elderly have important social roles cross-culturally, including as keepers of knowledge, care providers, and civil and religious leaders. Archaeologically, evidence for these roles is frequently invisible or ambiguous, with arguably the most definitive occurring as grave accompaniments within tombs of aged individuals. Until recently, methodological constraints have made the identification of older individuals using skeletal remains challenging (Appleby 2010). Traditional skeletal methods for estimating age-at-death are typically unable to estimate the ages for older adults beyond the use of broad ranges, such as 50+ (e.g., Brooks and Suchey 1990; Buckberry and Chamberlain 2002; McKern and Stewart 1957; Meindl and Lovejoy 1985; Todd 1920, 1921). The social identities of the archaeological elderly have been understudied as a result of these methodological challenges, which is a contributing factor to the public perception that few ancient people lived into old age (Cave and Oxenham 2016; Milner and Boldsen 2012c). Transition analysis, developed by Milner and Boldsen (2012a), has the ability to identify older individuals from skeletal remains, and therefore this method is ideally suited for researchers interested in the social identities of older individuals.

The lived experiences of older individuals are defined by multiple social identities as they are for all individuals. In this way identities are intersectional; in other words, the lived experiences of individuals are the result of the multiplicity of social identities they possess (Crenshaw 1991; Nash 2008; Shields 2008). Andean ethnographies and ethnohistoric sources describe differential experiences between elderly men and women

(Guaman Poma [1613] 2009; Meyerson 1990; Zorn 2004). Thus, a unidimensional study of identity with respect to age is insufficient to understand the lived experiences of the elderly in the past and in our consideration of elderly identities we adopt a multidimensional approach.

Armed with transition analysis (Boldsen et al. 2002; Milner and Boldsen 2012a), we re-evaluate the role of the elderly in for pre-contact Coastal Andean groups interred at the Late Intermediate Period (700-1300 C.E) site of Chiribaya Alta. We have chosen this context due to the excellent preservation of archaeological materials recovered from coastal Andean sites, as well as the emphasis upon gender and age in structuring modern and historic traditional Andean communities (e.g., Allen 1988; Bastien 1978; Bolin 2006; Guaman Poma [1613] 2009; Meyerson 1990; Zorn 2004). Our study combines analysis of skeletal remains and mortuary contexts to explore age-at-death patterning using the Bayesian statistical approach specified by transition analysis. Results from the transition analysis show that more Chiribaya individuals lived to old age than previously thought. Combining these age-at-death estimations with those for sex and mortuary contextual data, we are able to access the treatment of older individuals and expressions of their gender and age identities in the mortuary context. Our goal is to identify the existence of an elderly social identity and document how gender and age intersect gender and age for these older individuals. Based on Andean ethnographic and ethnohistoric reports, we expect that older individuals are valued and possess an elderly identity that operates differently for men and women.

### **The Elderly**

In many modern societies, the elderly are a marginalized group (Clark and Laurie 2000; Dempsey 1990; Round 2006; Townsend 1981; Walker 1981; Zhang 2007). The

modern elderly in western societies exist in a state of ‘structured dependency’ caused by multiple factors, including removal from productive work through mandatory retirement, low income from poverty-level pensions, and spatial separation from the community in retirement homes (Townsend 1981). These factors cause the elderly to occupy a marginalized status aggravated by potential actual and perceived physical and mental decline that can lead to a loss of agency.

The modern marginalization of the elderly is not necessarily present in past societies, and archaeologists acknowledge that social age identities are not universal across time and space (Appleby 2010, 2011; Gowland 2006; Sofaer 2011; Welinder 2001). Archaeological approaches to the elderly are limited, but some archaeological researchers have successfully examined the elderly in past societies (Appleby 2010, 2011; Cave and Oxenham 2016; Fahlander 2013; Gowland 2016; Welinder 2001). Appleby (2010) noted that during the Early Bronze Age of central Europe older women are still associated with gendered tools, despite having osteoarthritic changes that would have made participation in such tasks difficult. In contrast, Rebecca Gowland (2016) reports evidence for marginalization and possible elder abuse in Roman Britain using evidence of skeletal trauma and abnormal mortuary treatments.

Despite the above archaeological studies, approaches to the elderly have been limited due to both modern marginalization of the elderly and methodological challenges. While the marginalization of the elderly makes this social age identity of individuals unappealing to modern researchers (see Appleby 2010), bioarchaeologists also struggle with identifying older individuals using skeletal morphology (Appleby 2010; Cave and Oxenham 2016; Fahlander 2013). Traditional methods for estimating age-at-death suffer

two major challenges when estimating the age of older individuals: reference sample mimicry and inaccuracy of osteological age indicators.

The most prominent critique of skeletal age-at-death methods is the issue of reference sample mimicry (Konigsberg and Frankenberg 1992; Mensforth 1990) or, in Bayesian terms, prior distributions (Milner and Boldsen 2012b:231). Bocquet-Appel and Masset (1982) dramatically illustrated reference sample mimicry in the article “Death to Paleodemography” where it was revealed that the resulting age-at-death distribution of a skeletal sample was influenced by the age-at-death distribution of the reference sample used to develop the aging method. For example, when the McKern and Stewart (1957) system was used to assess the ages-at-death of an archaeological skeletal sample, the resulting distribution estimated that most individuals died during young adulthood. This result is consistent with the reference sample, which was comprised of men, predominantly under 35 years of age, killed during the Korean War. Responses to this critique include proofs that generated age-at-death distributions *do* differ from the method’s reference population (Van Gerven and Armelagos 1983), that problems with the McKern and Stewart system are generally known (Buikstra and Konigsberg 1985), and that the issues of sample mimicry are dwarfed by the drawbacks of current osteological techniques (Milner and Boldsen 2012b). Sample mimicry causes older individuals to be underrepresented in bioarchaeological samples because few reference samples contain a large number of older individuals.

The second critique associated with age-at-death estimation concerns the inaccuracy and bias inherent to osteological age indicators (Bocquet-Appel and Masset 1982, 1985; Hoppa and Vaupel 2002; Jackes 2000; Milner and Boldsen 2012b). Especially of concern are problems of age estimate accuracy and precision (Bocquet-



Apel and Masset 1982, 1985; Hoppa and Vaupel 2002; Jackes 2000; Klepinger et al. 1992), and the underestimation of older individual's ages (Appleby 2010; Aykroyd et al. 1999; Gowland 2007; Martrille et al. 2007). In terms of accuracy and precision, there is a tension between providing an accurate age range versus a precise age range. For analysts to produce useable age-at-death estimates, age ranges must be relatively precise but not so precise as to exclude the actual age. Accuracy and precision of age ranges is a problem for multiple age estimation methods, where for many individuals, especially those older than 40, the range encompasses most of adulthood (e.g. Brooks and Suchey 1990; Buckberry and Chamberlain 2002; Meindl and Lovejoy 1985). It is primarily this lack of precision in older age estimates that has led to the underrepresentation of older individuals in the archaeological record (Appleby 2010; Aykroyd et al. 1999). We seek to circumvent this challenge by using the transition analysis method (Milner and Boldsen 2012a), which we will describe in the methods section.

Archaeological studies have not addressed the elderly in Andean contexts, but ethnographic and ethnohistoric information can be used to explore expectations for the elderly in prehistoric Andean societies. The most well-known ethnohistoric explanation of aging in Andean societies was produced by Guaman Poma in his description of the Inka census, where segments of Inka society are divided into gender and age classes. For the elderly, there are two gendered age classifications. Guaman Poma described old men, between 60 and 78 years old, as useful servants in the houses of the elites (Guaman Poma [1613] 2009:192). The second old age class is that of the very old men, aged between 80 and 100 (Guaman Poma [1613] 2009:196). These men are respected by their communities but so old they only eat and sleep. Older women have slightly different age categories. Women who were 50 years old, were described as weavers of coarse cloth, as

well as being useful as servants (Guman Poma [1613] 2009:213), whereas very old women, 80 years of age (Guaman Poma [1613] 2009: 215) are described as primarily eating and sleeping, but they could provide childcare and also raise ducks and dogs.

Ethnographic reports from the Andes state that older individuals participate in productive tasks for as long as they are physically able with no expected age of retirement (Arnold 1997; Franquemont and Franquemont 1987; Loughran 1988; Zorn 2004). Increasing age is also associated with increased respect and value within Andean communities (Bastien 1978; Bolin 1998, 2006; Carter 1968; Meyerson 1990; Zorn 2004). Bastien (1978:62), describes how older men who have held a series of increasingly influential positions in village leadership become elders for their communities. These elders make decisions for the community and hold places of honor at local fiestas and rituals.

At the same time, this increase in respect for elderly individuals is clearly gendered (Arnold 2001; Mamani-Bernabé 2015; Mitchell 1994; Zorn 2004). For example, the social hierarchy for food distribution on the Peruvian island of Taquille in Lake Titicaca, begins with older men, while women are served after all men have received food (Zorn 2004). Thus, both age and gender play a role in Andean social hierarchies. Men in the Andes take on more authoritative public roles within their community as they age (Bastien 1978; Carter 1968). The ritual drinking of alcohol is also associated with men (Harris 1978:33-34). Harris (1978:33-34) describes how both men and women are required to be present for drinking rituals in Bolivian Laymi (Potosi) communities, but only 2-3 post-menopausal women are in attendance, in contrast to the larger group of 10-15 men. In contrast, household tasks are generally a woman's responsibility (Harris 1978; Mamani-Bernabé 2015; Van Vleet 2002). Middle aged and

older women are usually in charge of managing households and have an increased rank over younger women in the household, usually their own daughters or daughters-in-law (Mitchell 1994). Older women are also able to take on roles as midwives and participate in community politics (Arnold 2001). Therefore, the roles of women change and become increasingly flexible as they progress through the adult life course. We expect this to be the case at Chiribaya Alta.

### **Intersectional Identities**

This study considers both gender and age identities for the elderly at Chiribaya Alta using an intersectional approach. An intersectional approach argues that the experience of belonging to any single social identity category is inherently colored by the other social identities the individual possesses (Crenshaw 1991; Nash 2008; Shields 2008). Therefore, single dimensions of social identity are influenced by the other social identities possessed by an individual. This is an explicitly multidimensional approach to social identities.

Many archaeological researchers advocate a multidimensional approach to social identities (Battle-Baptiste 2011; Buikstra and Scott 2009; Geller 2009a, 2017; Meskell 2001; Sofaer Derevenski 1997a). For example, in their summary of identity studies, Buikstra and Scott (2009:47) note that, "the recognition that these various dimensions [of identity] are intertwined has resulted in the current emphasis on identity, as referencing the multiple forms of social affiliation that define individuals and communities." These authors advocate a multi-dimensional approach, as does Meskell (2001), who calls for an explicitly "third wave feminist" approach to the study of identity; an appeal that references the emergence of intersectionality in black feminist movements. These calls have been answered with archaeological studies from around the globe illustrating the

utility of intersectionality in the study of ancient social identities (Conkey 2017; Garcia-Ventura 2016; Sjöberg 2012; Thedéen 2012; Torres-Rouff and Knudson 2017).

The concept of intersectionality is associated with the feminist movement and developed as a response to the centering of gender as the single source of oppression in women's lives without consideration for the impact of race and other identities (Cho et al. 2013; Davis 2008; McCall 2005). Thus, intersectionality is strongly associated with the work of black feminists, especially Crenshaw (1989, 1991), Collins (1990), and Davis (1981), who were interested in the additional challenges faced by women of color. We follow the definition of intersectionality proposed as, "the interaction between gender, race, and other categories of difference in individual lives, social practices, institutional arrangements, and cultural ideologies and the outcomes of these interactions in terms of power," (Davis 2008:68). Concepts of intersectionality are socially important because they are fundamental to understanding the power relationships that structure social interaction and inequality (Crenshaw 1989; McCall 2005; Nash 2008). We emphasize that intersectional identity studies must focus on "categorizations [which] should be analyzed as mutual and intertwined processes of transformation and not as a mere addition of gender, class, ethnicity, race, sexuality, and so on," (Lykke 2010:51). In this case study from Chiribaya Alta, we view the gender and age identities of the elderly as mutually existing and reinforcing identities that shape lived experiences. We prefer to refer to this as an intersectional approach but do not use the term intersectionality because we are not addressing power differentials, one of the major goals of intersectionality.

### **Age as an Identity**

Our study is interested in the social identities of the elderly as seen through mortuary contexts. Before we are able to address social age, aging, and the elderly in

archaeological contexts, it is important to define our terms. In this section, we present the concepts and theoretical approaches to age relevant to our study of the Ilo Chiribaya.

**Age identities** are constructed social identities, which can have variable meaning depending on cultural context. While all social identities can be fluid, the uniqueness of age identity lays within the expectation that the identity will change over the life course (Appleby 2011; Kaufman and Elder 2002; Lucy 2005). Regrettably, age has rarely been considered as a social identity despite its long-term presence as an analytical element in bioarchaeological studies (Lucy 2005; Sofaer Derevenski 1994). Influenced by gender studies, archaeologists have recently attempted to address this issue through studies of children (Ardren and Hudson 2006; Baitzel and Goldstein 2014; Baxter 2005; Bugarin 2005; Ceruti 2010; Halcrow and Tayles 2008; Joyce 2000; Kamp 2001; Lillie 1997; Moore 2009; Sofaer Derevenski 1997b), the elderly (Appleby 2010, 2011; Cave and Oxenham 2016; Fahlander 2013; Gowland 2016), and the life course (Gilchrist 2004, 2011, 2012; Gowland 2006; Harlow and Laurence 2002; Laurence 2000; Lozada and Rakita 2013; Sofaer Derevenski 2000).

**Age identity** is conceptualized in a manner similar to any culturally constructed social identity. Kaufman and Elder (2002:169) characterize age identity as, “the subjective evaluation of a person’s age, which is subject to individual and historical experiences.” Age identity is an individual’s experience of their social age category. In contrast, aging is the process through which an individual’s age identity shifts as she or he progresses through the life course (Appleby 2011; Sofaer 2011:290; Welinder 2001). Aging can relate to chronological, biological, and social age changes, which we discuss in more depth below.

Age is a multifaceted concept, consisting of three distinct categories based on different criteria: chronological age, biological age, and social age. This tripartite model is adapted from sociologists Ginn and Arber (1995). They argue that the tripartite model provides distinctions within the concept of age, one which is similar to the differentiation of sex and gender (Ginn and Arber 1995:5). Here, we present this tripartite model.

The first category of age is chronological age, which is measured in increments of time. Western societies measure chronological age of individuals, with other calendrics used in non-Western contexts and sometime recorded. For example, the glyphs at the Maya site of Piedras Negras record the chronological ages of a series of rulers (Proskouriakoff 1960). Chronological age, as a category, is not directly accessible to bioarchaeologists working in most contexts without historical documentation, but it can be estimated through its correlation with the biological markers of aging on a skeleton (Kemkes-Grottenthaler 2002; Sofaer 2011). While important in Western society chronological age, likely is and was of limited importance to those persons living in societies where calendar years are not recorded. For example, in 1970s African Hausa society, individuals rarely knew their chronological age, although they always knew who was relationally older or younger (Schildkraut 1978:119).

The second category of age is biological age, the physical aging of an individual's body. Biological age is usually correlated to chronological age but occurs at different rates for individuals (Anstey et al. 1996; Levine 2013). Biological aging impacts the body's skeletal system, providing tangible markers which can be studied by bioarchaeologists. The biological age of an individual is used by bioarchaeologists in age-at-death estimation methods to approximate chronological age (Kemkes-Grottenthaler 2002; Sofaer 2011). Skeletal indicators, however, were not visible to people

in past societies and those visible markers of biological age on living persons (e.g. wrinkles, grey hair, etc.) are usually inaccessible to bioarchaeologists (Fahlander 2013:229; Sofaer 2004:166).

The third category of age is social age, which is usually the main focus of archaeological studies of age identity. Social age is comprised of the, "socially constructed norms concerning appropriate behavior and attitudes for an age group," (Gowland 2006:143). Bioarchaeologists investigate social age by considering cultural expression materially present in both body and funerary context and correlating it to age-at-death estimates (e.g. Gowland 2000, 2006; Sofaer Derevenski 1997a).

These three categories of age are interrelated, as specific indicators of biological age or a certain number of chronological years can initiate particular social ages (Ginn and Arber 1995). For example, in some western societies individuals are expected to retire at 65 at which point individuals are removed from the modes of production (Townsend 1981; Walker 1981). This illustrates how chronological and social ages can be linked in social contexts.

In this study, we use biological characteristics to estimate chronological age using transition analysis (Baldsen et al. 2002; Milner and Baldsen 2012a). These age-at-death data are in turn combined with an analysis of mortuary contexts. In this way, we develop an understanding of social age identities, focusing on the older individuals in the Chiribaya Alta sample. As such, we will address what constitutes an elderly person in Chiribaya society, and the transition of individuals to this identity.

### **Gender Identity**

For an intersectional approach it is necessary to discuss gender identities, in addition to age, in our study of the Chiribaya elderly. Gender is "the cultural

interpretation of sexual difference that results in the categorization of individuals, artifacts, spaces, and bodies” (Gilchrist 1999:xv). As such, it is a social identity built upon perceived human sexual difference. Studies of gender in archaeology have emphasized that it is a variable social identity cross-culturally and reject the application of Western gender ideology onto past societies (e.g., Brumfiel 2006; Buikstra and Scott 2009; Conkey and Spector 1984; Geller 2009b; Gero and Scattolin 2002; Gilchrist 1999).

Traditionally, sex in western cultures has been viewed a fixed binary biological characteristic (Hubbard 1996; Moore 1994; Walker and Cook 1998). This view has been critiqued as not acknowledging the variation present in human sexual difference and the cultural construction of sex (Fausto-Sterling 1993; Geller 2008; Hubbard 1996; Moore 1994). The modern western concept of two sexes has only been favored since the seventeenth century, as previously males and females were viewed as a variation of a single sex (Laqueur 1990). Thus, the manner in which sex is classified is in itself a cultural construct.

In this study, we are interested in how gender impacts the experiences of aging and elderly. To accomplish this, we rely on binary classifications of sex developed by bioarchaeologists based on morphological markers on the human skeleton. We necessarily rely on these sex estimates to help guide our interpretations of the role of gender in impacting age identity. Results from previous gender studies concerning the Chiribaya are also employed so we can understand the fluid nature of gender, aging, and elderly identities (Lozada and Rakita 2013; Schach and Buikstra n.d.).

The intersectional nature of gender and age identities has been acknowledged in numerous archaeological studies (Glencross 2011; Gowland 2006; Meskell 1999; Rega 1997; Sofaer Derevenski 1997a, 1997b, 2000; Stoodley 2000). Studies combining age



and gender have focused on either characterizing a broad life course study with gender or, more specifically, the gendering of children. As an example, studies have considered changes in grave good patterns in relation to gender changes throughout the life course (e.g. Gowland 2006, Sofaer Derevenski 1997a). The study by Sofaer Derevenski (1997a) avoids binary gender classifications and expressions by recognizing that gender is a variable identity dependent on an individual's age (Sofaer Derevenski 1997a:877). At the site of Tiszapolgar-Basatanya the construction of sex is associated with the side of the body within the burial, while the construction of gender is related to the distribution of grave goods throughout the life course (Sofaer Derevenski 1997a). Derevenski's analysis provides a dynamic discussion of the proper means of addressing the way individuals are gendered throughout their lives. Thus, gender is characterized as a learned and fluid social identity that can also change throughout the aging process.

## **The Chiribaya *Señorío* of Ilo**

### *The Ilo Chiribaya*

We focus on the elderly associated with the Ilo Chiribaya polity of southern Peru. Archaeological investigations of this complex Andean polity benefit from the excellent preservation of materials at Chiribaya sites; this portion of coastal Peru is a very arid desert. Here, we introduce this group, present the site of Chiribaya Alta, and discuss previous studies of social identities, especially those tied to gender and age.

The archaeologically identified Chiribaya are a group primarily dated to the Late Intermediate Period (700-1300 C.E.). It consisted of complex chiefdoms in the coastal south-central Andes, stretching from the Tambo valley of Arequipa to the Azapa valley of Northern Chile (Focacci 1990; Jessup 1991; Kolomanski 2016; Muñoz Ovalle and Focacci A. 1985). There appear to have been two major centers of the Chiribaya culture,

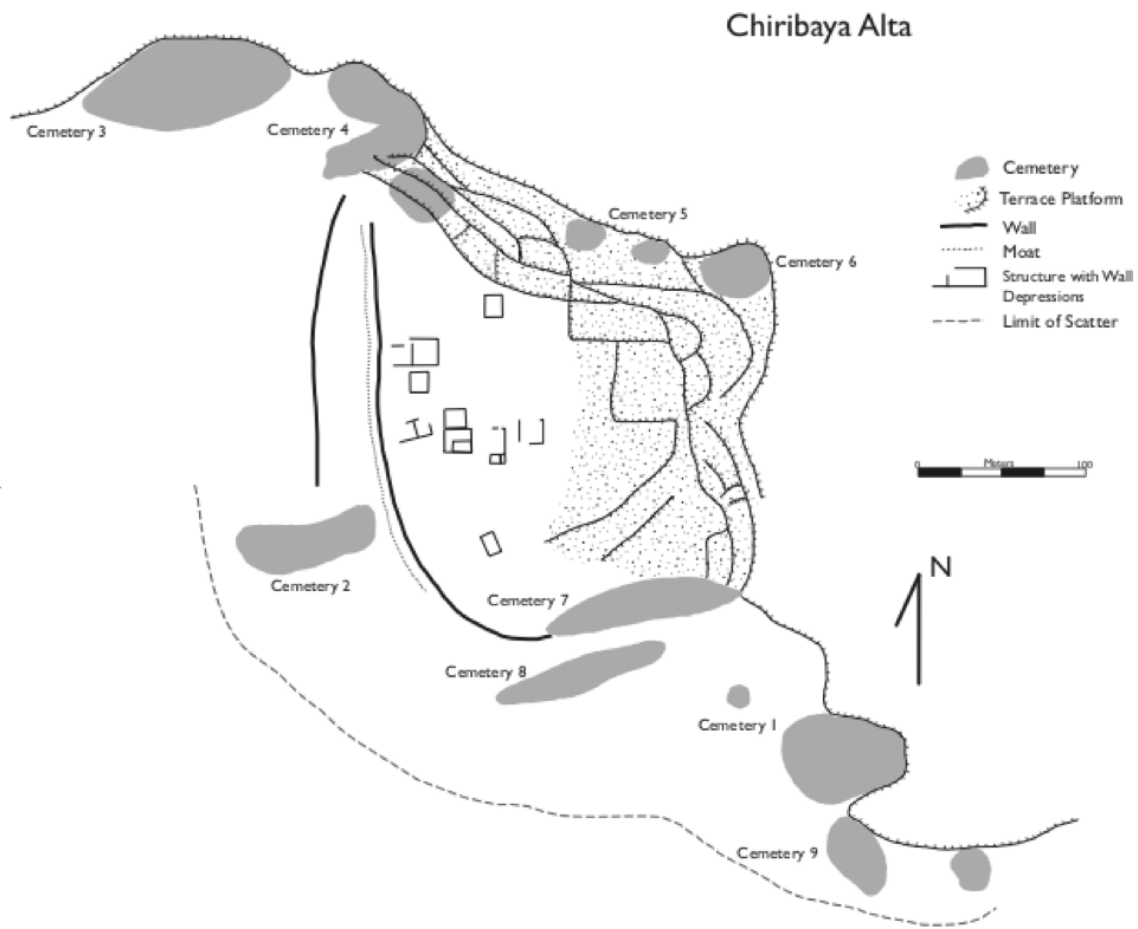


Figure 14. Map of Peru showing the location of Chiribaya Alta.

one in the Ilo valley of Moquegua in Peru and the other in the Azapa valley of northern Chile (Jessup 1991; Muñoz Ovalle and Focacci A. 1985). Our focus is the site of Chiribaya Alta, which is located in the Ilo valley (Figure 14). Major excavations of four Chiribaya sites in the Ilo valley, Chiribaya Alta, Chiribaya Baja, Yaral, and San Geronimo, occurred in the late 1980s and early 1990s as part of Proyecto Chiribaya directed by Jane Buikstra (Buikstra 1995).

Archaeological investigations of the Ilo Chiribaya primarily focused on political economic concerns. Archaeological and bioarchaeological evidence from these studies suggests that the Ilo Chiribaya followed a horizontal subsistence strategy and formed a *señorío*, a coastal polity present in ethnohistoric literature (Lozada and Buikstra 2002, 2005; Rostworowski 1970, 1977, 1989). *Señoríos* are loosely organized polities

consisting of two groups of economic specialists. The first group, the *labradores*, was terrestrially based and cultivated the agricultural land for the polity (Lozada and Buikstra 2005). The *pescadores* were the second group, and they were responsible for the marine-based activities (Lozada and Buikstra 2005). Economically specialized groups among the Chiribaya polity are similar to those described ethnohistorically (Lozada and Buikstra 2002, 2005). The *labradores* are most strongly associated with the inland site of Yaral, while *pescadores* are most strongly associated with the coastal site of San Geronimo.



**Figure 2:** Site map of Chiribaya Alta.

### *Chiribaya Alta*

Chiribaya Alta is the most elaborate Ilo Chiribaya site excavated to date (Figure 15; Buikstra 1995; Buikstra et al. 2005; Jessup 1990). This site is 5 km from the coast located on the pampa overlooking the lower Ilo valley (Jessup 1991; Buikstra et al. 2005). Thus, Chiribaya Alta is in a location well suited to access both maritime and terrestrial resources (Buikstra 1995; Jessup 1990, 1991). As such, Chiribaya Alta is a mixed site with distinct cemeteries associated with both the *labrador* and *pescador* community groups. Cemeteries, agricultural terraces, domestic structures, and a wall and moat are present at the site (Buikstra et al. 2005). Thus far, archaeological investigations have identified and sampled nine cemeteries from Chiribaya Alta, yielding 307 tombs in total (Buikstra 1995).

Burgess (1999) previously generated skeletal age-at-death data from Chiribaya Alta using individuals composed of at least 10 skeletal elements. She primarily relied on the Suchey-Brooks method of estimating age-at-death using the pubic symphysis, which was the most accurate at the time of research. The maximum age category in her analyses is 50 year or older. Sex estimations used primarily os coxa and cranial morphological characteristics. For Chiribaya Alta, Burgess identified 61 males, 89 females, 188 juveniles, and 34 individuals of unknown sex, for a total of 372 individuals analyzed from the site. The age-at-death distribution for Chiribaya Alta is also presented by Lozada and Rakita (2013).

Gender and age have not yet been a major focus of Ilo Chiribaya studies; there are known mortuary treatments associated with these social identities (Lozada and Rakita 2013; Schach and Buikstra n.d.). Young individuals, under five years old, are associated with urn burials, which have been hypothesized to serve as symbolic wombs (Lozada and

Rakita 2013:118). Gendered artifact associations are also present in mortuary contexts (Lozada and Rakita 2013; Schach and Buikstra n.d.). *Keros* and musical instruments are associated with male burials, while female burials are associated with weaving tools (Lozada and Rakita 2013:119). Schach and Buikstra (n.d.) used a multiple correspondence analysis to yield similar results, but additionally found bags to be associated with male burials and textile kerchiefs with females.

## **Materials and Methods**

### ***Materials***

Skeletal data was collected from the adult portion of the skeletal sample from Chiribaya Alta, defined as those individuals with sufficient development to score their pubic symphyses and auricular surfaces using transition analysis. This collection is housed at Centro Mallqui in Algorobal, Peru. Data were collected with permission from the Peruvian Ministerio de Cultura under permit number 000034-2016/DGM/VMPCIC/MC during October through December of 2016. Mortuary data from excavations at Chiribaya Alta directed by Jane Buikstra were checked against the Centro Mallqui inventory of artifacts.

### ***Age-at-death estimation using Transition Analysis***

Traditional methods for estimating age-at-death lack precision when estimating the ages of older adults, which has contributed to the underrepresentation of the elderly in the archaeological record (Appleby 2010; Aykroyd et al. 1999; Gowland 2007). Transition analysis has proven to be better at estimating the ages of old adults, and several recent studies using archaeological samples have shown that many adult individuals lived past 50 years of age (Buikstra et al. 2006; Bullock et al. 2013; DeWitte 2014, 2018). For example, Bullock et al. (2013) compared traditional techniques and

transition analysis in a sample from postclassic Cholula and found that 64% of adult skeletons were over fifty whereas traditional skeletal techniques estimated that only 15% of the skeletal sample were that old. Transition analysis has also been applied to the significant case of the Maya King Lord Pakal of Palenque (Buikstra et al. 2006). Initial osteological analyses of Pakal's skeletal remains indicated that he was 40 to 50 years at death. This estimate contradicted the epigraphic Maya dates on Pakal's sarcophagus, which indicated he was 80.4 years at the time of his death. Buikstra et al. (2006) were able to re-estimate his age-at-death using transition analysis, producing a maximum likelihood that the ruler was 80.9 years of age at death, an estimate that is twice the earlier result using traditional methods and is consistent with the epigraphic information from the tomb (Buikstra et al. 2006:59). Transition analysis has not been widely adopted yet, but a study of inter-observer error indicates that there are low levels of disagreement between researchers using this method (Fojas et al. 2018).

Therefore, the adult age-at-death estimates for this study of Chiribaya Alta used the transition analysis method (Boldsen et al. 2002; Milner and Boldsen 2012a). This is a component system using the morphology present on three areas of the skeleton: the pubic symphysis, auricular surface, and cranial sutures. All adult individuals at Chiribaya Alta with preserved pubic symphyses and auricular surfaces were scored using the above technique. Cranial suture closure scores were not included in the analysis because they are the least accurate of skeletal indicators used in the method and because a large proportion of skulls (~60%) from Chiribaya Alta are modified or have adhering desiccated flesh. Extreme cranial modification, as at Chiribaya Alta, may impact cranial suture closure rates (Delashaw et al. 1991; White 1996), and in many cases hair or other tissues obscure cranial details. Maximum likelihood and 95% confidence intervals for

age-at-death ranges are calculated in the ADBOU program using Bayesian statistics and an informative prior distribution from a seventeenth century Danish village. Therefore, the resultant age-at-death range and maximum likelihood estimate is calculated based on the specific morphological indications present on each individual skeleton.

### ***Sex Estimation***

Adult sex estimation is considered by bioarchaeologists to be less problematic than estimating age-at-death (Walker et al. 1988). Skeletal sex estimation is built on the western assumption that biological sexual variation is phenotypically binary. This view, however, does not consider the full variety of human sexual variation (Fausto-Sterling 1993) or acknowledge that this view of sex is itself a cultural construction (Geller 2008; Hubbard 1996). As such, we use the term “estimation” for sex instead of “determination,” because estimation more clearly acknowledges the proxy nature of skeletal sex.

We are interested in how gender intersects with aging and elderly social identities at Chiribaya Alta. As such, the sex of skeletal individuals was also estimated for this analysis. Sex estimates used morphology on the os coxa and cranium (Buikstra and Ubelaker 1994; Phenice 1969; Walker 2005). Indicators of sexual dimorphism in the pubis bone were prioritized during sex estimation because they are more accurate than those on the skull (Bruzek and Murail 2006; Meindl et al. 1985). Generally, adults scored for transition analysis were also sufficiently intact for sex estimation, although a few individuals did not have intact morphology and/or conflicting morphological indicators. Sex was not estimated for these individuals.

### ***Mortuary Analysis***

Mortuary contexts provide a wealth of information to archaeological researchers, and thus, these contexts have been used extensively to study past societies (e.g., Binford

1971; Brown 1995; Buikstra 1995; Gamble et al. 2001; Goldstein 1981; Rega 2000; Sofaer Derevenski 1997a). Graves are created through ritual processes by the living and, of course, not by the dead individuals themselves. Thus, there are important caveats to consider when using mortuary contexts to infer aspects of the dead's social identities (Carr 1995; Hertz [1907] 1960; Hodder 1980; Parker Pearson 1982). In this section, we discuss these caveats and present our theoretical approach to mortuary analysis in our study of graves from Chiribaya Alta.

Tombs are purposeful interments of human remains and associated objects; thus, tombs provide information about a dead individual's biology and their society. In a processual framework, archaeologists have used the objects buried with the dead to infer aspects of their *social persona*, where it was assumed that all mortuary treatments either belonged to or reflected the status of the individual (Binford 1971; Saxe 1970). A tomb, however, is created by living mourners during funerary ritual, and items placed in the grave may therefore extend beyond the role or social status of the deceased (Hodder 1982). Hertz ([1907] 1960) was the first to characterize explicitly a tripartite relationship between the body, soul, and living mourners. Acknowledging the role of the mourners and the social actions that took place during the burial rites allows for a nuanced, more complex understanding of the mortuary record (Hodder 1982; Parker Pearson 1993). In this study, we view funeral rites as a social practice where constructed social identities are reflected in mortuary treatments (Appleby 2010, 2011; Damm 1990:130; Díaz-Andeu 2005:39; Gowland 2006; Sørensen 2000:92-93).

While we acknowledge that grave goods are placed within the tomb by the mourners participating in burial rites; in the Andes these objects were also likely those used during life by the deceased (e.g. Ackerman 1991; Cieza de León [1554] 2010:117;



Cobo [1653] 1990: 250). During the Inka period, Cobo describes a practice of dressing Inka elites in their clothing and assembling objects used during life ([1653] 1990: 250). Archaeologically, numerous studies of Andean textiles have noted wear on the dead's clothing (Cassman 2000; Minkes 2005; Oakland Rodman 1992), suggesting that they had been worn during life by the decedent. A similar ethnographic example comes from Abancay, Peru, where the dead individual is dressed and buried in the clothes they wore while alive (Ackerman 1991:243).

Here, mortuary analysis is employed to explore the social understanding of intersecting gender and social age identities. The fifteen artifact types included in these analyses are: *arpon* (harpoon), *balsa* (boat model), *bolsa* (bag), *calabasa* (gourd), *camelido* (camelid remains), *cantaro* (jug), *cesta* (basket), *cuchara* (spoon), *cuenco* (bowl), *cuy* (guinea pig), *jarra* (pitcher), *kero* (beer drinking vessel), *pañuelo* (textile kerchief), *zampoña* (panpipes), and weaving tools (includes drop spindles, *wichuñas* [a tool for warp-faced weaving], combs, needles, etc.). Other artifact classes occurred too infrequently to be included in these analyses. Since it is known that *bolsas*, *keros*, *pañuelos*, *zampoña*, and weaving tools have gendered associations, we are especially interested in how the presence of these artifacts are related to age during the adult life course.

First, we calculated the frequency of artifact type presence in graves. Frequencies were calculated for each sex and divided using ten-year age-at-death intervals. The frequency of grave good types was used to see if there was a changing trajectory of artifact frequencies over the life course. It is expected that gendered patterns are present, based on previous research. We also expect that these identities are differentially emphasized in graves at separate times during the adult life course. We also expect that

production tools will be present in the graves of older individuals, as ethnographic and ethnohistoric information suggests that Andean individuals continue to participate in production during old age (Franquemont and Franquemont 1987; Guaman Poma [1613] 2009; Zorn 2004).

Counts of artifacts in tombs of those individuals with age-at-death estimated at Chiribaya Alta were used to test if increasing age was correlated with more artifacts overall and for each artifact type. To test the correlation between age and an increase in the number of artifacts we used Kendall rank correlation tests, where p-values allow us to reject the null hypothesis that there is not a relationship between increasing age and number of artifacts in a tomb. The Kendall rank correlation was chosen because it is non-parametric test that measures the association between two sets of variables (Madrigal 2012). Artifact frequencies and age correlations were calculated for the entire sample and for males and females separately to allow us to infer the manner in which age and gender intersect during the adult life course.

We expect that the number of artifacts increases in graves of adults as they age to reflect their increased respect within Chiribaya communities, as ethnographies emphasize the respect individuals have for older members of their communities (Bastien 1978; Bolin 1998, 2006; Meyerson 1990; Zorn 2004). It is also anticipated that different artifact types increase for males and females, reflecting the manner in which gender and age identities intersect. Previous analyses of gender at Chiribaya Alta show that males are associated with textile bags, *keros*, and musical instruments, while females are associated with *pañuelos* and weaving tools (Lozada and Rakita 2013; Schach and Buikstra n.d.). Based on ethnographic reports, we expect older women to have greater flexibility in gendered

expression and increasing access to masculine activities as they age (Arnold 2001; Harris 1978).

## **Results**

We use the above methods in our exploration of the presence and identity of aging individuals in Chiribaya society. We have divided these results to address age-at-death estimation and the presence of older individuals and the manner in which gender and age intersect across the adult life course. Here we present the results of the analyses from Chiribaya Alta.

### ***Chiribaya Alta Age-at-death Estimation***

Age-at-death estimates were generated for adults buried at Chiribaya Alta with scorable pubic symphyses and auricular surfaces. Age-at-death estimates using transition analysis were generated for 123 individuals. This study primarily uses the corrected maximum likelihood age as a point estimate of age-at-death, but we acknowledge that these estimates are imprecise and reflect a broader range for the age-at-death.

The paleodemographic curve for adults at Chiribaya Alta has changed dramatically based on the age-at-death results using transition analysis (figure 16). Most notably, the sample of adults older than 50 has more than tripled, from 11 individuals (Burgess 1999; Lozada and Rakita 2013) to 36 individuals, using the corrected maximum likelihood age at death. Here we can see that the adult skeletal sample contains many individuals who died in their 70s and 80s. These data suggest that transition analysis provides a powerful tool for adult age-at-death estimation that can dramatically shift the age-at-death distribution for individuals at an archaeological site and can provide an appropriate data set for studying the aging process and social age identities.

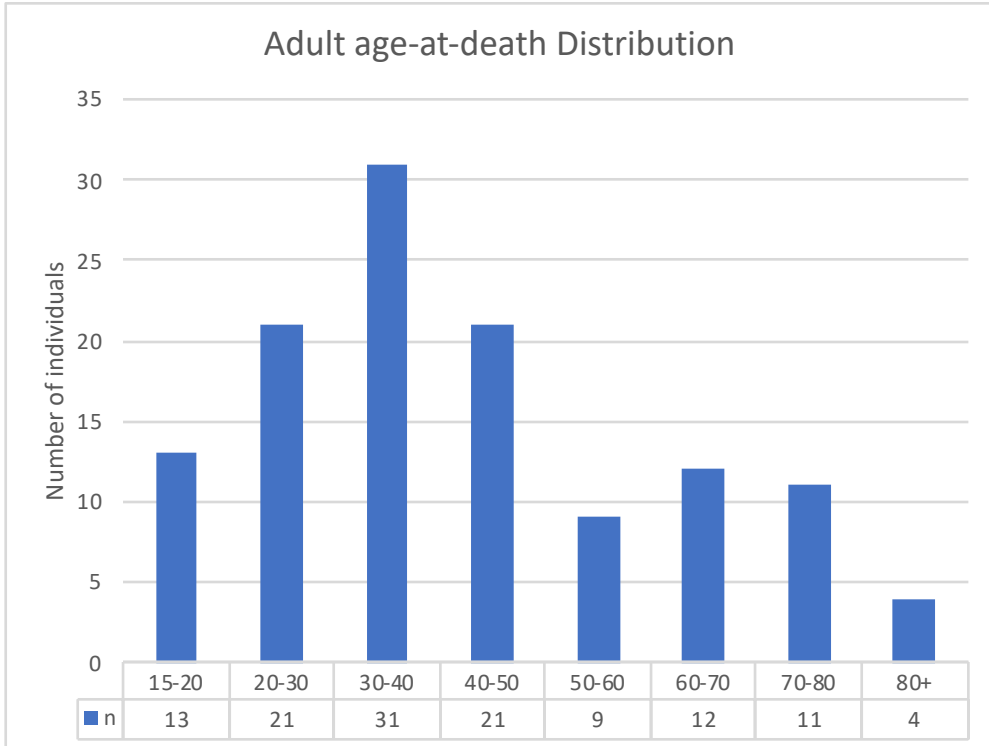


Figure 16. Age-at-death distribution of individuals with age estimates generated using transition analysis.

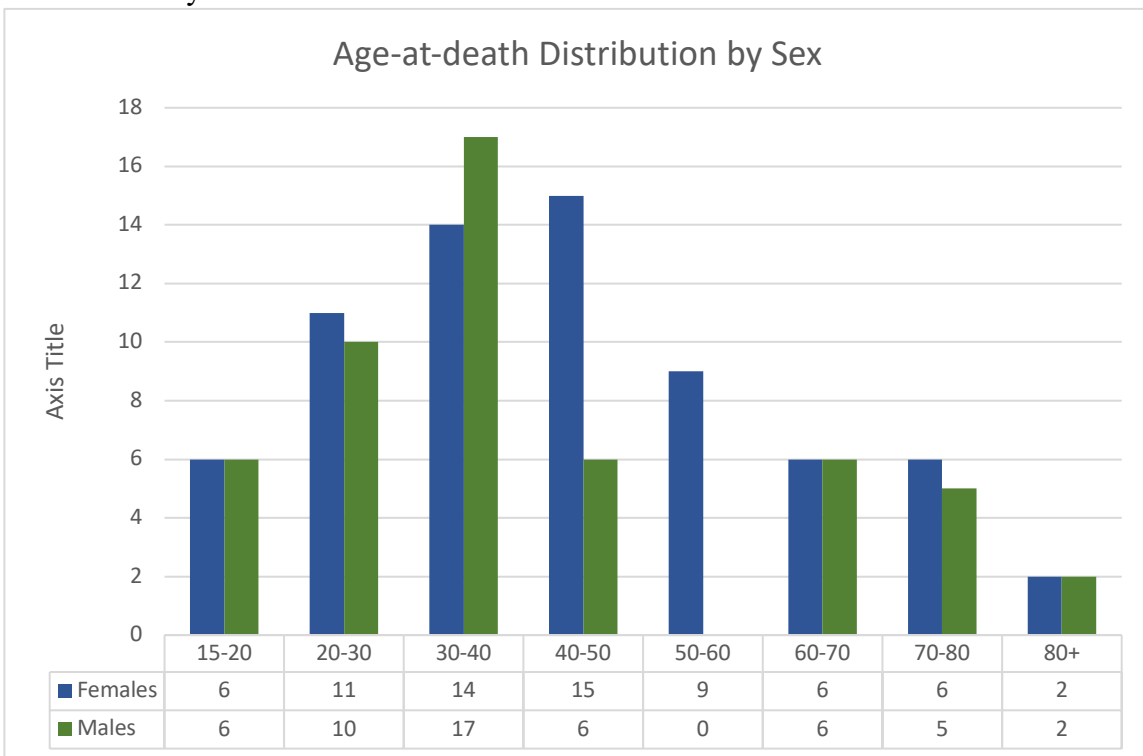


Figure 17. Age-at-death distribution of individuals by sex.

The average adult age of death at Chiribaya Alta is 42.4 years. There is little difference between adult males and females in terms of age-at-death. Males dies slightly younger on average at 40.8 years and females have a slightly higher average at 43.6. This difference between male and female average age at death is not statistically significant using a two-tailed t test ( $p=0.414$ ). There are some differences between the paleodemographic curves of males and females (figure 17). Notably, there are no males that had a most likelihood age-at-death estimate between 45 and 62. We do not suspect that individuals between these ages did not die or were buried at another site, but rather we suspect this reflects a lack of precision in estimating the maximum likelihood age-at-death (since this is covered by the 95% correct range estimate for age-at-death) and/or a sampling error. We assume that this unusual result at least partially reflects sampling error, since only a fraction of the Chiribaya Alta site has been excavated.

Paleodemographic conclusions can be strongly impacted by sample bias of archaeological remains (Jackes 2011; Paine and Harpending 1998; Walker et al. 1998).

These age-at-death estimations from Chiribaya Alta indicate that older individuals were present in Chiribaya society. We can see from these results that life for everyone in Chiribaya society was not short, but rather that a segment of the population was living to old age. These results challenge archaeological narratives developed using traditional age-at-death methods, which underestimate the number of older individuals buried at archaeological sites. Now we will combine the adult age-at-death data with mortuary analyses to explore the intersection of age and gender for elderly individuals.

### ***Mortuary Analyses***

Mortuary analyses were conducted using the sample of graves associated with adults whose ages were estimated using transition analysis. When a tomb contained the

remains of multiple individuals, frequently reflecting bones introduced from looting, efforts were made to match the tomb contexts to the primary individual. As such, 114 tombs were included in our mortuary analysis of adults from Chiribaya Alta. We are primarily interested in the manner in which age and gender intersect for elderly individuals. Here we present the results of these mortuary analyses.

First, we examined the frequency of artifact presence over the adult mortuary sample from Chiribaya Alta. Age grades were arbitrarily divided into ten-year increments based on individual's corrected point estimate for age-at-death. Frequencies were calculated for the overall sample and for females and males separately (table 6). There appears to be a general pattern of an increased frequency of artifacts for older individuals but there is no identifiable age grade at which this occurs. It is notable that the highest frequencies of artifact presence amongst the ten-year age ranges are in those range above 50 years at death, except for *zampoñas* (pan-pipes).

We used Kendall rank correlation tests on artifact counts from the 114 tombs included in the analysis to see if an increase in artifacts is associated with increasing age-at-death. All artifact types show a positive correlation between increasing age and number of these artifacts in Chiribaya tombs (table 2). These positive correlations are significant for camelid remains ( $\tau=0.153$ ,  $p=0.036$ ), jugs ( $\tau=0.182$ ,  $p=0.017$ ), baskets ( $\tau=0.214$ ,  $p=0.004$ ), and bowls ( $\tau=0.177$ ,  $p=0.013$ ). When all of the analyzed artifact classes are combined, there is a significant positive correlation with age ( $\tau=0.194$ ,  $p=0.003$ ).

All individuals																
	n	Arpon	Balsa	Bolsa	Calabasa	Camelido	Cantaro	Cesta	Cuchara	Cuenco	Cuy	Jarra	Kero	Pañuelo	Zampoña	Weaving Tools
15-20	13	7.7%	15.4%	15.4%	46.2%	23.1%	15.4%	15.4%	38.5%	38.5%	23.1%	38.5%	7.7%	23.1%	0.0%	15.4%
20-30	18	5.6%	16.7%	22.2%	38.9%	22.2%	5.6%	22.2%	50.0%	44.4%	16.7%	27.8%	5.6%	22.2%	5.6%	27.8%
30-40	29	6.9%	27.6%	48.3%	44.8%	31.0%	17.2%	20.7%	41.4%	55.2%	17.2%	31.0%	13.8%	3.4%	<b>17.2%</b>	37.9%
40-50	20	10.0%	20.0%	35.0%	55.0%	35.0%	15.0%	35.0%	40.0%	60.0%	15.0%	30.0%	10.0%	35.0%	5.0%	50.0%
50-60	7	0.0%	42.9%	28.6%	<b>85.7%</b>	42.9%	28.6%	57.1%	<b>71.4%</b>	<b>85.7%</b>	<b>57.1%</b>	<b>71.4%</b>	14.3%	<b>42.9%</b>	0.0%	<b>71.4%</b>
60-70	13	0.0%	15.4%	38.5%	53.8%	<b>61.5%</b>	38.5%	<b>61.5%</b>	61.5%	69.2%	38.5%	53.8%	15.4%	23.1%	15.4%	38.5%
70-80	10	20.0%	40.0%	40.0%	30.0%	20.0%	20.0%	40.0%	40.0%	40.0%	30.0%	20.0%	20.0%	30.0%	0.0%	30.0%
80+	4	<b>25.0%</b>	<b>50.0%</b>	<b>50.0%</b>	75.0%	50.0%	<b>75.0%</b>	50.0%	50.0%	75.0%	25.0%	50.0%	<b>50.0%</b>	25.0%	0.0%	25.0%
All	114	7.9%	24.6%	35.1%	49.1%	33.3%	20.2%	32.5%	46.5%	55.3%	23.7%	36.0%	13.2%	21.9%	7.9%	36.8%
Females																
	n	Arpon	Balsa	Bolsa	Calabasa	Camelido	Cantaro	Cesta	Cuchara	Cuenco	Cuy	Jarra	Kero	Pañuelo	Zampoña	Weaving Tools
15-20	6	16.7%	16.7%	16.7%	50.0%	16.7%	16.7%	16.7%	33.3%	66.7%	33.3%	50.0%	0.0%	33.3%	0.0%	33.3%
20-30	11	9.1%	18.2%	9.1%	18.2%	18.2%	9.1%	18.2%	45.5%	36.4%	9.1%	18.2%	0.0%	27.3%	0.0%	45.5%
30-40	14	7.1%	14.3%	21.4%	21.4%	28.6%	0.0%	0.0%	42.9%	42.9%	0.0%	28.6%	0.0%	7.1%	<b>7.1%</b>	42.9%
40-50	14	14.3%	21.4%	21.4%	64.3%	<b>50.0%</b>	21.4%	42.9%	35.7%	64.3%	14.3%	42.9%	14.3%	35.7%	<b>7.1%</b>	64.3%
50-60	7	0.0%	42.9%	28.6%	<b>85.7%</b>	42.9%	28.6%	<b>57.1%</b>	71.4%	<b>85.7%</b>	<b>57.1%</b>	<b>71.4%</b>	14.3%	42.9%	0.0%	<b>71.4%</b>
60-70	7	0.0%	0.0%	0.0%	42.9%	42.9%	28.6%	<b>57.1%</b>	<b>85.7%</b>	57.1%	<b>57.1%</b>	<b>71.4%</b>	0.0%	28.6%	0.0%	<b>71.4%</b>
70-80	5	<b>40.0%</b>	<b>60.0%</b>	40.0%	40.0%	20.0%	20.0%	40.0%	40.0%	40.0%	40.0%	40.0%	<b>20.0%</b>	40.0%	0.0%	60.0%
80+	2	0.0%	0.0%	<b>50.0%</b>	50.0%	<b>50.0%</b>	<b>50.0%</b>	50.0%	0.0%	50.0%	0.0%	50.0%	0.0%	<b>50.0%</b>	0.0%	50.0%
All	66	10.6%	21.2%	19.7%	43.9%	33.3%	16.7%	28.8%	47.0%	54.5%	22.7%	42.4%	6.1%	28.8%	3.0%	54.5%
Males																
	n	Arpon	Balsa	Bolsa	Calabasa	Camelido	Cantaro	Cesta	Cuchara	Cuenco	Cuy	Jarra	Kero	Pañuelo	Zampoña	Weaving Tools
15-20	7	0.0%	14.3%	14.3%	42.9%	28.6%	14.3%	14.3%	42.9%	14.3%	14.3%	28.6%	14.3%	14.3%	0.0%	0.0%
20-30	7	0.0%	14.3%	42.9%	71.4%	28.6%	0.0%	28.6%	57.1%	57.1%	28.6%	42.9%	14.3%	14.3%	14.3%	0.0%
30-40	15	6.7%	40.0%	73.3%	66.7%	33.3%	33.3%	40.0%	40.0%	66.7%	33.3%	33.3%	26.7%	0.0%	26.7%	<b>33.3%</b>
40-50	6	0.0%	16.7%	66.7%	33.3%	0.0%	0.0%	16.7%	50.0%	50.0%	16.7%	0.0%	0.0%	<b>33.3%</b>	0.0%	16.7%
50-60	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60-70	6	0.0%	33.3%	<b>83.3%</b>	66.7%	<b>83.3%</b>	50.0%	66.7%	33.3%	83.3%	16.7%	33.3%	33.3%	16.7%	<b>33.3%</b>	0.0%
70-80	4	0.0%	25.0%	50.0%	25.0%	25.0%	25.0%	25.0%	50.0%	50.0%	25.0%	0.0%	25.0%	0.0%	0.0%	0.0%
80+	2	<b>50.0%</b>	<b>100.0%</b>	50.0%	<b>100.0%</b>	50.0%	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>50.0%</b>	<b>50.0%</b>	<b>100.0%</b>	0.0%	0.0%	0.0%
All	47	4.3%	29.8%	57.4%	57.4%	34.0%	25.5%	36.2%	46.8%	57.4%	25.5%	27.7%	23.4%	10.6%	14.9%	12.8%

Table 6. Artifact frequencies across the adult life course for the entire sample, females, and males analyzed from Chiribaya Alta. The highest frequency during the adult life course is bolded.

Artifact	All individuals		Females		Males	
	Tau	p value	Tau	p value	Tau	p value
Arpon	0.068	0.378	0.024	0.811	0.150	0.216
Balsa	0.104	0.176	0.110	0.283	0.130	0.285
Bolsa	0.116	0.114	0.088	0.378	<b>0.259</b>	<b>0.021</b>
Calabasa	0.104	0.166	0.181	0.067	0.061	0.604
Camelido	<b>0.153</b>	<b>0.036</b>	0.150	0.122	0.162	0.156
Cantaro	<b>0.182</b>	<b>0.017</b>	<b>0.200</b>	<b>0.047</b>	0.202	0.092
Cesta	<b>0.214</b>	<b>0.004</b>	<b>0.224</b>	<b>0.022</b>	0.214	0.064
Cuchara	0.044	0.551	0.105	0.291	-0.003	0.976
Cuenco	<b>0.177</b>	<b>0.013</b>	0.163	0.084	<b>0.225</b>	<b>0.047</b>
Cuy	0.102	0.181	<b>0.212</b>	<b>0.035</b>	0.009	0.942
Jarra	0.072	0.341	<b>0.206</b>	<b>0.037</b>	-0.146	0.224
Kero	0.102	0.186	0.115	0.259	0.116	0.335
Pañuelo	0.128	0.084	0.141	0.146	0.037	0.756
Zampoña	0.004	0.954	0.015	0.881	0.025	0.834
Weaving	0.086	0.239	0.116	0.220	-0.060	0.622
Overall	<b>0.194</b>	<b>0.003</b>	<b>0.201</b>	<b>0.020</b>	0.177	0.090
	n=114		n=66		n=47	

Table 7. Table of Kendall's rank correlation rho and associated p values testing the relationship between age and number of artifacts from the above types. Values are reported for all adult individuals in the transition analysis sample, females, and males. Significant correlations are bolded.

These analyses suggest that there are changes in artifact frequencies and an increase in the number of artifacts for older individuals at Chiribaya Alta. To test the difference between the graves of older and younger adults, we used artifact counts and a t test to see if the graves of older individuals have a greater average number of artifacts in their graves. Since there is no clear age threshold for becoming elderly, we selected 50 years as the break point between younger and older adults. The average number of artifacts buried with individuals older than 50 (n=34) was 11.03 (std. dev.= 9.88), whereas the average for younger adults (n=80) was 5.8 (std. dev.=6.44). Using a Welch's



unpaired two-tailed t test this difference is statistically significant with a p value of 0.007 (t=2.838).

To test the extent that gender intersects with age, we also did the above analyses for females and males separately. The artifact frequency data show differences between how males and females accumulate grave goods over the life course (table 1). Differences between the number of males and females are confirmed using Kendall rank correlations (table 2). While both males and females have an increase in artifacts types overall with increasing age, only females have a significant increase in the number of artifacts overall (rho=0.201, p=0.020). In terms of specific grave goods, for females there is a significant increase in *cantaro* (jugs, p=0.047), *cestas* (baskets, p=0.022), *cuy* (guinea pigs, p=0.035), *jarra* (pitchers, p=0.037) and in overall number of artifacts (p=0.020). In contrast, for male burials there is a significant increase in the amount of *bolsas* (bags, p=0.021) and *cuenco* (bowls, p=0.047).

## **Discussion**

The results of the analysis from Chiribaya Alta have much to contribute to the study of social identities and the elderly in the archaeological record. Here we present our interpretation of these results. In this section, we argue that the study of the elderly is possible using transition analysis, the individuals at Chiribaya Alta gradually age through the adult life course, and that the aging process is gendered, where the intersection of age and gender interact to shape the lived experiences of elderly men and women in Chiribaya society.

### ***Presence of Older Individuals***

The presence of older individuals in archaeological samples makes the study of the elderly possible. The elderly are marginalized in modern society (Clark and Laurie

2000; Dempsey 1990; Round 2006; Townsend 1981; Walker 1981; Zhang 2007) and understudied in the archaeological record (Appleby 2010, 2011; Cave and Oxenham 2016, 2017; Fahlander 2013; Gowland 2016; Welinder 2001). This lack of archaeological inquiry partially stems from methodological challenges, where most skeletal age-at-death indicators have imprecise ranges for older individuals. These methods estimate that older individuals in a skeletal sample have an age-at-death of 50+. Furthermore, issues of reference sample mimicry further cause the under-representation of older individuals in archaeological samples. Bioarchaeologists have made efforts to improve methods for identifying older individuals in archaeological samples and to address the social identities and roles of the elderly in past society (Appleby 2010, 2011; Buikstra et al. 2006; Cave and Oxenham 2016, 2017; Fahlander 2013; Gowland 2016; Welinder 2001).

In our case from Chiribaya Alta, transition analysis as developed by Milner and Boldsen (2012a) greatly increased the representation of older individuals in the skeletal sample. This method produces age estimates beyond 50+, and identified individuals in their sixties, seventies, and eighties. The identification of older individuals addresses a major challenge for bioarchaeologists interested in the elderly. These data from Chiribaya Alta indicate that it is possible to analyze gender and age identities for older individuals.

### ***The Elderly and Intersectional Identities***

The data from Chiribaya Alta indicate that older individuals are differentiated from younger ones, which suggests the presence of an elderly social identity that individuals develop through the aging process. These older individuals have more artifacts than younger individuals buried at the site. There are several possible explanations for this increase in artifacts. It could be that older individuals accumulate more goods over the life course and thus are able to have more objects in their graves.

Ethnohistoric and ethnographic evidence does suggest that individuals are buried with items that they owned and used (Ackerman 1991; Cieza de León [1554] 2010:117; Cobo [1653] 1990: 250). Another explanation is that older individuals increase in status as an individual ages. This explanation is also consistent with ethnographic data stating that older individuals are respected within communities ((Bastien 1978; Bolin 1998, 2006; Carter 1968; Meyerson 1990; Zorn 2004). Nevertheless, this increase in artifacts differentiates older individuals from younger ones and suggests the presence of an elderly identity.

While it is unclear why older individuals have more artifacts, these data do suggest that the elderly were not marginalized in Chiribaya society. This result is in opposition to views in many modern societies, where the elderly are marginalized (Clark and Laurie 2000; Dempsey 1990; Round 2006; Townsend 1981; Walker 1981; Zhang 2007). Elderly individuals were also marginalized in some archaeological contexts, for example, Gowland (2016) highlights several older female burials from Roman Britain with unusual burial treatments and evidence of impairment and/or trauma.

In contrast, this does not appear to be the case at Chiribaya Alta, which is dramatically illustrated by the contents of tomb 419. This tomb was not included in the above mortuary analyses because it is a clear outlier in terms of the amount of grave goods and the number of people interred in the tomb. Tomb 419 is the most elaborate and largest burial at Chiribaya Alta (Buikstra et al. 2005; Lozada and Buikstra 2005). It contains three individuals, one male and two females, along with 137 grave goods, which include textile bags, kerchiefs, ceramics, camelid skulls, guinea pigs, weaving tools, gourds, spoons, *keros*, birds, etc. It is thought that the male in the tomb is the primary occupant. This is notable because if we look at the age-at-death estimate of the occupants,

the male is an older adult with a most likelihood age-at-death estimate of 71.4 (46.7-74.4). The two females in the tomb are 47.5 (32.1-70.3) and 51 (33.2-74.4). This tomb represents a significant labor investment in terms of grave goods and size and thus, it has been hypothesized that this tomb belonged to a paramount lord of the Chiribaya *señorío* (Lozada and Buikstra 2005). Thus, this male individual was likely a high-status member of Chiribaya society and shows that older individuals were able to achieve and/or maintain important roles in Chiribaya society.

Furthermore, there is no decrease in the number of production tools in the graves of older individuals. In fact, both the number of harpoons and weaving tools have a slight, but not significant, correlation with increasing age. The presence of these objects in the graves of older individuals suggests that they continued to participate in these tasks as they aged. This is also consistent with Andean ethnographic and ethnohistoric reports, which report that older individuals continued to participate in productive tasks (Franquemont and Franquemont 1987; Guaman Poma [1613] 2009; Zorn 2004). For example, weaving tools are frequently buried in the graves of older females (see table 1). Ethnographic data indicates that modern Andean women weave for as long as they are physically able, after which time they switch to spinning (Franquemont and Franquemont 1987; Zorn 2004). Considering that the oldest female buried with a spindle at Chiribaya Alta is estimated to have been 83.5 years old at death (Tomb 752, 95% CI: 69.2-94.1), older Chiribaya women likely also participated in yarn production.

The expressions of age identity for those buried at Chiribaya Alta was also gendered. This evidence emphasizes the importance of an intersectional approach to social identities, where the experience of one social identity, such as gender, is influenced by the other social identities possessed by the individual. In our study, it is clear that age and

gender are intersectional identities at Chiribaya Alta. Both men and women progress through the adult life course to an elderly status, but the artifacts they accumulate through this process are gendered. Here, we will discuss this differential pattern, focusing primarily on artifacts with known gender associations.

There is an increase in the frequency of masculine associated artifacts in male graves for older males buried at Chiribaya Alta. These are *bolsas* (textile bags), *keros* (beer drinking cups), and *zampoña* (panpipes). All of these artifacts are most frequent for individuals in ten-year age ranges above 60. In contrast, artifacts feminine associations, *pañuelos* (kerchiefs) and weaving tools are not only uncommon overall in male graves, but they are also most frequent among male individuals in ten-year age ranges of less than 50. Thus, as men age their masculinity is increasingly emphasized in the mortuary space.

There is also an increase in the frequency of feminine associated artifacts in the graves of females at Chiribaya Alta. The highest frequencies of feminine artifact types, *pañuelos* (kerchiefs) and weaving tools, are for female individuals in ten-year age-at-death ranges above 50. This is also true for two of the masculine associated artifacts: *bolsas* (textile bags) and *keros* (beer drinking cups). Thus, older Chiribaya women were able to exercise increasing flexibility in their gendered expression as they age, illustrated by the frequency of masculine associate artifacts in the graves of older females. This is expected considering ethnographic reports, which report that older Andean women have access to a wider variety of social roles than younger women (Arnold 2001; Harris 1978).

To further illustrate these points about intersectional identities we will discuss two artifact classes in more depth, *bolsas* and *keros*. Both of these artifact classes are

associated with masculine identities at Chiribaya Alta, but they emphasize the differences between the identities of older male and female individuals at Chiribaya Alta.

For male burials at Chiribaya Alta, there is a significant increase in the number of *bolsas* in graves associated with increasing age-at-death. Textile bags, also known as *chuspas*, like the ones found at Chiribaya Alta are associated with carrying coca in the modern and archaeological Andes (Finley Hughes 2010; Horta and Aguero 1997; Martin 1970; Sharratt 2014). This association is true at Chiribaya Alta, where many of the textile bags still contain coca leaves. The association between *chuspas* and males at Chiribaya Alta is consistent with ethnographic literature. *Chuspas* are used primarily by men in locales in the Peruvian and Bolivian highlands, where women use textile kerchiefs instead of bags to carry their coca (Bastien 1978; Medlin 1987; Zorn 1986, 2004). This association is not universal in the Andes, as there are places where women use *bolsas* to carry coca (Femenías 2005; Ortega Perrier 2016; Presta 2010; Sharratt 2014).

The increase in *bolsas* associated with older males at Chiribaya Alta provides interesting insight into the way gender and age intersect through the aging process. This signal of a man's gender identity becomes increasingly important and emphasized as they age. *Bolsas* are frequent in the graves of men at all stages of the adult life course, and it is especially common for older men to be buried with multiple coca bags. This is exemplified in burial 751, which contains an old male (MLE=80.1; 95% CI 62.7-92.2) with nine coca bags. Based on dental evidence (Indriati 1998), this individual was not a regular coca chewer, but it was still important for him to possess these *bolsas*.

*Bolsas* are not an artifact exclusive to males, as female burials also sometimes contain coca bags. Female burials also show an increase in the number of *bolsas* with age, but this increase is not statistically significant. It is notable, however, that *bolsas* are

present in graves of females aged 70-80 and 80+ with the same frequencies as for males in these age grades. Therefore, while *bolsas* are associated with men, this association is not exclusive and the presence of *bolsas* is just as frequent in the graves of the oldest women as they are for the oldest men. Thus, older women have more flexibility in their gendered expression as they age when compared to younger women and when compared to older men, who do not tend to possess artifacts with feminine associations.

The second artifact type we will discuss are *keros*. These tall, cylindrical vessels, however, are usually associated with males at Chiribaya Alta (see table 1; Lozada and Rakita 2013; Schach and Buikstra n.d.). *Keros* are associated with the public consumption of *chicha*, a maize beer, during rituals (Allen 2002: 115). They are known to have been used in rituals during the Inka Period, and they are found in archaeological sites associated with earlier time periods (Cobo 1979; Goldstein 2003; Guaman Poma [1613] 2009; Moseley et al. 2005). In ethnographic literature, Andean women are still involved with *chicha* rituals, but they are typically associated with making and serving the brew (Hames 2003; Jennings and Bowser 2009; Perlov 2009; Silverblatt 1978, 1987; Tschopik 1946; Weismantel 2009). Harris (1978) does describe how post-menopausal women are more likely to participate in drinking rituals in the highlands of Bolivia (Potosi). Thus, while this object is associated with males, Chiribaya individuals of both genders likely participated in their associated rituals.

*Keros* are associated with males at Chiribaya Alta, but they are sometimes present in the graves of females. All of these females, however, were older than 40 when they died. This provides a further illustration of intersectional social identities, because these older females possess a male-associated artifact. This suggests that women are able to access and perform typically masculine symbols and roles as they age. This does not

mean that these older women have taken on a masculine identity. For example, burial 746 contains an older female (MLE=73.5; 95% CI 54.9-87.5) buried with a *kero* and a *bolsa*. This burial also contains artifacts associated with the feminine gender: two textile tools and five *pañuelos*. Therefore, this woman was able to take on increasingly masculine roles and symbols with her old age while still maintaining feminine ones.

It is clear from these data at Chiribaya Alta that aging is a process that impacts both age and gender identity. This is an example of intersectional social identities, where lived experiences are influenced by multiple social identities in ways that are not additive. In the Chiribaya case, it is clear that older individuals are not old and gendered but are old men/women, where aging operates differently depending on an individual's gender. This is an important contribution of intersectionality to identity studies (Bowleg 2008; McCall 2005). For the Chiribaya elderly, age and gender are mutually existing and reinforcing identities that influence mortuary expressions of their identities and experiences.

## **Conclusion**

In this article we have presented an approach for studying the elderly that combines bioarchaeological and mortuary data. Transition analysis, a recently developed age-at-death estimation method, has proven useful for identifying older individuals within skeletal samples. The identification of older individuals has been a challenge for skeletal analysts, who typically use methods with large and imprecise age-at-death ranges for older individuals. The identification of older individuals using skeletal remains allows us to access elderly identities in the archaeological past.

The mortuary contexts from Chiribaya Alta indicate that aging was a gendered process, where gender and age identities intersect to influence an individual's lived



experiences. Men and women are both able to accumulate grave goods and do not appear to be marginalized, in contrast to modern views of the elderly. The aging process for men and women, however, is gendered. This is illustrated by the correlation of different artifacts with increasing age between men and women at Chiribaya Alta. It appears that for older men, masculinity is increasingly emphasized as they are buried with more masculine-associated artifacts. In contrast, female burials have an increase in both feminine and masculine associated artifacts. Thus, Chiribaya women are able to take on masculine tasks and associations as they age, suggesting that gendered expressions are more flexible for older women. This study shows the utility of using an intersectional approach to social identities in archaeological studies.

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## CHAPTER 5

### CONCLUSION

This dissertation uses various approaches in its examination of social identities at Chiribaya Alta. The case studies presented each examine a different dimension of social identity, while also using newly generated data or distinct analytical technique. These studies have been successful, and it is clear that social identities at Chiribaya Alta were marked in the mortuary context.

The case studies presented in this dissertation address different social identities to develop a more complete understanding of Chiribaya lived experiences. First, I will summarize each of the case studies presented in this dissertation. Then I will briefly describe how each of these case studies articulate with and build upon our previous understanding of Chiribaya social identities.

#### **Summary of Results**

Chapter 2 argues that the designs on coca bags buried with the dead at Chiribaya Alta signify *ayllu* affiliation through the representation of landscape features in iconographic designs. The Ilo Chiribaya polity was an archaeological *señorio*, which is an Andean chiefdom consisting of multiple occupational communities. We argue that these occupational communities can be envisioned as a form of *ayllu*, which is a form of Andean group identity. *Ayllus* are kinship groups that occupy particular territorial places on the landscape (Allen 1981; Bastien 1978; Goldstein 2000; Weismantel 2006). Affiliation to particular landscape features, such as mountains, figure prominently in indigenous Andean religion and are the recipient of various offerings including coca (Allen 1988; Bolin 1998; Radcliffe 1990).

The analyses presented in chapter 2 use data from 87 textile bags housed at Centro Mallqui in Algorrobal, Peru. To understand differences between *labradores* and *pescadores*, the frequency of designs present on bags found in cemetery four were compared to those of cemetery seven. There is no significant difference between the textiles, yarns or supra-structures present on coca bags from the two cemeteries, but there are significant differences between the frequencies in which different designs on bags between the two cemeteries. It is hypothesized that these designs reference the landscape, based on comparisons of iconographic elements to those used in modern Andean contexts. Thus, members of the two occupational groups buried at Chiribaya Alta had different affiliations to landscape features, which suggests that these groups operated similarly to modern Andean *ayllus*.

In chapter 3, I address the manner in which normative gender roles and gender identities are expressed in graves at Chiribaya Alta through the presence of artifact types. Chapter 3 argues that the use of multivariate methods, rather than univariate frequency comparisons, avoids the imposition of Western gender binaries onto the archaeological past. Multivariate methods can accomplish this through the inclusion of all burials in analyses, rather than only using sexed burials as in the case in univariate studies. Instead, multivariate methods only use sex information in the interpretation phase of the analysis.

The gender analysis presented in chapter 3 uses multiple correspondence analysis (MCA), an extension of traditional correspondence analysis, to address gender at Chiribaya Alta. 195 grave lots at Chiribaya Alta are included in the MCA, but only 90 of these contain skeletons with sex estimates which are used as a supplementary variable. Fifteen of the most common artifact types are included in the MCA. The results of the MCA show that gender is reflected in the second factor, where keros, textile bags, and

musical instruments are associated with males and weaving tools and *panuelos* are associated with females. These analyses reveal that normative gender roles at Chiribaya Alta do tend to be binary, as certain artifact types have masculine or feminine associations. When individual sexed graves are examined, however, it appears that individual gender identities are flexible. This is because all of the artifact types with gendered associations also occur in the graves of individuals of the other sex. Therefore, this analysis of gender at Chiribaya Alta suggests that there is flexibility in the gender identity of individuals despite the existence of normative gender roles.

Chapter 4 of the dissertation addresses the elderly and related social identities at Chiribaya Alta. The elderly have been mostly overlooked in mortuary studies because traditional age at death estimation techniques lack accuracy and precision for older individuals. In the case study presented as part of this dissertation, I employ transition analysis, which is a recently developed technique that has proven better able to identify older individuals using skeletal remains. Using results from transition analysis applied to the adult skeletal sample at Chiribaya Alta, the goal of the case study presented in chapter 4 is to identify the existence of an elderly social identity and examine the manner in which gender and age intersect for older individuals. The use of an intersectional approach to social identities acknowledges that the experiences and social identities of individuals are colored by the other social identities an individual possesses.

Transition analysis was used to estimate the age-of-death for 123 individuals buried at Chiribaya Alta. The resultant age-at-death estimates greatly increased the number of older individuals in the sample when compared to results using traditional skeletal techniques, from 11 individuals to 36 individuals over the age of 50. Mortuary analyses were then employed on tombs with adults aged using transition analysis (n=114)

to examine the nature of elderly social identities at Chiribaya Alta. The most likelihood age at death (MLE) was used to divide tombs into groups according to ten-year age ranges. Older individuals tended to have more artifacts than younger individuals, and there is a significant correlation with the increase in number of artifacts and age-at-death ( $\tau=0.194$ ,  $p=0.003$ ). The results of these analyses indicate that older individuals were differentiated from younger ones through an increase in the number of artifacts in their graves. This suggests that the elderly were not marginalized in Chiribaya society. There are differences however, in which artifacts increase in frequency and number according to sex. Male graves showed an increase in masculine associated artifacts, textile bags, *keros*, and *zampoña*, suggesting that the masculinity of male individuals was increasingly emphasized as they aged. Female graves show a similar increase in feminine associated artifacts as they age, but also have an increase in textile bags and *keros* in their graves. This suggests that for older women, gender roles are flexible, and they are able to access more masculine associated roles as they age. This study of the elderly at Chiribaya Alta is a successful example of combining transition analysis with mortuary analyses to better understand the identities of the elderly in the past.

### **Chiribaya Social Identities**

These three case studies generated new results regarding social identities at Chiribaya Alta. To better understand the intellectual contribution of these case studies, I will now contextualize these results in terms of previous Chiribaya studies.

Previous analyses of community identity within the Ilo Chiribaya *señorío* identified two occupational groups, *labradores* and *pescadores*. It is clear from bioarchaeological analyses that membership in one of these two communities resulted in different diets and cranial modification styles (Tomczak 2003). Furthermore, it was

known that these two groups used different pottery styles to signal their community identity (Dziedzic 2016). The results of the case study from chapter 2 indicate that members of each community buried at Chiribaya Alta also used different iconography on their coca bags and furthermore, these designs appear to reference the landscapes most important for their livelihood. This is consistent with ethnographic descriptions of *ayllus*, which are Andean kinship groups who share particular affiliations with landscape features.

Gender had also been previously analyzed at Chiribaya Alta in a study by Lozada and Rakita (2013). These authors used a univariate analysis of grave good frequencies, where *keros* and musical instruments were significantly associated with males and weaving tools with females. Chapter 3 of this dissertation builds on these results using a multivariate method, multiple correspondence analysis (MCA), which is used to avoid binary assumptions about gender and able to understand relationships between graves based on grave good assemblages. This analysis indicates that there are normative gender roles reflected in mortuary treatments at Chiribaya Alta, where *keros*, musical instruments, and textile bags have masculine associations, whereas weaving tools and *pañuelos* have feminine associations. When individual graves are examined however, we see flexibility in how individuals expressed their gender identity as many graves contain non-normative gendered grave goods. These insights allow for a greater understanding of the nature of gender within Chiribaya society and add to the corpus of archaeological studies attempting to understand gender systems in non-western contexts.

While the case studies presented in chapters 2 and 3 focus on social identities previously researched in Chiribaya contexts, the chapter 4 case study examines the elderly. Archaeological examinations of the elderly have been limited, largely due to the

methodological limitations present in skeletal age-at-death estimations. Using transition analysis, numerous older individuals were identified at Chiribaya Alta and these individual's grave goods indicate that older individuals were not marginalized in Chiribaya society. Furthermore, mortuary analyses indicate that age and gender identities intersected to result in increased emphasis on masculinity for older men and increased accessibility to masculine roles for older women. This case study provides a clear example of how new bioarchaeological techniques can be used in mortuary studies to lead to more complex and contextual understanding of past social identities.

In summary, this dissertation demonstrates the importance of and the complex nature of social identities in the prehistoric Andean past. Through the use of multiple methods newly applied in Andean bioarchaeology, especially textile analyses, multiple correspondence analysis, and transition analysis, this dissertation has demonstrated the utility of using multiple lines of evidence to approach ancient social identities. While previous analyses of Chiribaya social identities have largely focused on community identity, we have laid the ground work in this dissertation for an intersectional approach to Chiribaya social identities by illustrating the impact of multiple social identities in the mortuary space. Future analyses will seek to further illuminate the intersectional nature of Chiribaya social identities and examine the ways in which community identities intersected with gender and age to impact lived experiences.



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