

Writing with Twisted Cords:

The Inscriptive Capacity of Andean *Khipus*

Recently discovered *khipu* -- twisted and coloured cord -- letters shed insights into the ancient writing system of the Inkas.

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Although Spanish witnesses claimed that Inka era (1400 - 1532 CE) *kipus* -- twisted and knotted cords -- encoded historical narratives, biographies and epistles (Urton 2003; Conklin 2002, 54-5), no specific khipu has ever been reliably identified as a narrative text. This has led scholars to assert that khipus served merely as memory aides recording only numbers and comprehensible only to their makers (Given-Wilson 2016). The view that khipus were simple mnemonic tools challenges theories which argue that complex civilizations, such as the Inka Empire, require 'writing' -- a means to preserve information in a durable form according to communal conventions, and understandable to individuals familiar with the norms (Boone 2011; Salomon 2001). In 2015, the author examined two khipus safeguarded by indigenous authorities in the remote Andean village of San Juan de Collata. Village leaders state that these khipus are narrative epistles about warfare created by local chiefs. The existence of epistles, comprehensible to recipients, implies a shared communication system (Conklin 2002, 54-5). Analysis of the khipus reveals that they contain 95 different symbols, a quantity within the range of logosyllabic writing systems, and notably more symbols than in regional accounting khipus. At the end of each khipu, three-cord sequences of distinct colours, fibres, and ply direction appear to represent lineage ("*ayllu*") names. The epistolary khipus of Collata indicate that Andean khipus could constitute an intelligible writing system, possibly logosyllabic (1).

The community of Collata (elevation = 3,180 m) is located in Huarochiri Province, Peru. Village leaders invited the author to document their sacred khipus, which was done as part of a larger project studying Central Andean patrimonial

kipus. Virtually all extant khipus are conserved in university, museum and private collections (Curatola Petrocchi and de la Puente Luna 2013; Urton and Brezine 2011). Simple herders cords have existed into the 20th century in the regions of Cuzco (Mackey 2002), Lake Titicaca (Uhle 1897; Hyland 2014) and Oruro, Bolivia (Pimentel H. 2005). Patrimonial khipus, that is, khipus that have "been held as a historic legacy in [their] owner communities but [are] not a productive medium at the time of documentation" (Salomon 2004, 12) occur in seven indigenous Peruvian communities, all in the Central Andes. These are Tupicocha (Salomon 2004), Anchucaya (Hyland 2016), Casta (2), Rapaz (Salomon et. al 2011), Mangas (Hyland, Ware, and Clark 2014), Pari (Kaufmann Doig 1973), and Collata. All known Central Andean khipus, except for Collata's, are believed to have been primarily for accounting.

In Collata, the khipus were stored in a sacred wooden box containing over 100 manuscripts, the earliest dating to 1645. Most of the colonial documents are official correspondence between community authorities and the colonial government. There are also inventories of church property, reports from local administrators, and memorials about Collata's legal struggles against neighbouring settlements over land rights. Inside the box, the manuscripts are preserved within 37 specially prepared goat hide folders called "*capachos*"; the khipus were kept together in an open plastic bag that lay on top of the *capachos* in the box. Village authorities formally note the presence of the *capachos* and khipus in the inventory of community property every June. The khipus show little evidence of felting, indicating that they have not been handled frequently. While highly valued, the manuscripts are not generally consulted in village affairs, although one senior man

reads through them in his spare time. Most Andean communities maintain village archives of 19th and 20th century documents (Rappaport and Cummins 2011; Salomon and Niño-Murcia 2011; Platt 2015); the manuscripts in Collata's sacred box are unusual for their antiquity and quantity. Collata is the only village in the Andes where colonial manuscripts and khipus are known to be preserved together in the same archive.

When a man accepts responsibility for sponsoring a major festival, he is shown the manuscripts and khipus in the box, which, until recently, were kept secret from non-initiated community members. Senior men inform neophytes that native leaders created the khipus as epistles ("*cartas*") about their wars on behalf of the Inka in the 18th century. They say that the khipus were created around the time of the legendary local chief and Spanish sympathizer, Pedro Cajayauri, whose signed handwritten letter to colonial authorities, dated 1757, is preserved with the other manuscripts in the village archive.

In fact, natives of Huarochiri fought for Inka pretenders to the throne in 1750 and 1783 (Spalding 1984; Sala i Vila 1995). The 1750 rebellion, led by Francisco Inka, began when armed natives in Huarochiri killed the local Spanish administrator and 16 other Spaniards, and was quickly put down. This revolt was based mainly in the southern portion of the province, far from Collata, which is located along the northern edge of the Huarochiri region. However, the 1783 rebellion, led by Felipe Tupa Inka Yupanki, actually centred primarily in Collata and in the neighbouring village of San Pedro de Casta (3). The 1783 Huarochiri revolt came at the end of the failed Tupac Amaru rebellion in the southern Andes. Felipe Tupa Inka Yupanki, who claimed to be the brother of rebel leader Tupac Amaru, arrived in Collata in 1783 and

began to organise a native uprising that aspired to restore the Inkas to power. From Collata and Casta, Felipe Tupa Inka Yupanki issued handwritten decrees appointing officers in his revolutionary army and describing his goals. Nonetheless, local colonial officials soon learned about the planned revolt, and its leaders were captured, tried and executed (Rezaval y Ugarte 1783).

Khipu literacy apparently was widespread in Huarochiri among natives, both men and women, in the latter half of the 18th century. Evidence suggests that Andeans composed khipu epistles during the rebellions to ensure secrecy and affirm cultural legitimacy (Salomon 2004; Szeminski 1987). Spanish chroniclers, including Miguel de Estete and Felipe Guaman Poma de Ayala, stated that Inka runners, known as "*chasquis*", carried khipus as letters during the Inka period (Conklin 2002, 54-5). It is unclear how similar the 18th century khipu missives may have been to the earlier Inka khipu letters. However, it is likely that there was some similarity between the Inka and colonial khipu missives given that the general structure is comparable and that one of the main features of the latter -- the needlework bundles described below -- are common in Inka khipus. Colonial manuscripts in Collata's sacred box reveal that members of this community spoke Quechua in the past, although villagers today are monolingual Spanish speakers. Therefore, if the symbols of the Collata khipus had any link to spoken language, the language would have been Quechua, not Jaqaru or Kawki.

The overall structure of the Collata khipus is similar to Inka era khipus, consisting of a top cord from which hang pendant cords. Khipu A has 288 pendants, divided into nine irregular groups by eight cloth ribbons tied along the top cord, which is 62.2 cm long. Khipu B has 199 pendants, divided into four groups along the

top cord (58.4 cm long). Although the khipus were stored together, Khipu B is more deteriorated. Pendant lengths vary, the longest being 48.3 cm. The Collata khipu pendants lack knots, except for end-knots to prevent cords from unravelling. Although approximately two-thirds of the 700+ extant khipus in the world contain knots indicating decimal numbers (Urton and Brezine 2011), one-third of all khipus display no numbers, as is the case with the Collata cords.

Each khipu commences with a multicoloured bundle, known locally as a "cayte", which signifies both the beginning and the subject matter of each khipu (Hyland 2016). Khipu B's cayte (3.8cm long) consists of a tuft of bright red deer hair wrapped with light brown vicuña threads. The cayte is followed by an introductory sequence of eight pendants followed by another cayte (7.0 cm long): a woven cone of red, medium brown and light brown vicuña, with an unidentified metallic thread and a ball of red alpaca fibres (Figure 1).



Figure 1. Khipu B's caytes. Village authorities insisted on handling the khipus without gloves to feel the fibre differences. Photo by author.

Khipu A's cayte (1.3 cm long) is a woven tubular bundle of alpaca: red, blue, light brown and dark brown, with the deteriorated remains of a red tassel at the end. The cayte is followed by an introductory sequence of 12 pendants, followed by a ribbon tied to the top cord (Figure 2).



Figure 2. Khipu A's top cord with ribbons. Photo by author.

An empty bag (3.8 cm long), from the same white and cream coloured woven cloth as the ribbons, is tied to the end of pendant 39. Villagers explained that this cloth came from the distinctive kerchief indicating the lineage leader ("*ayllu jefe*"),

symbolising his authority, similar to wax seals used to authenticate European letters and proclamations (Figure 3).



Figure 3. Lineage ("*ayllu*") chief insignia bag on Khipu A. Photo by author.

Two senior herders assigned to assist me identified the animal fibres of the pendant cords (in order of decreasing frequency): vicuña, alpaca, guanaco, llama, deer, and vizcacha. The herders insisted that the fibre type conveyed meaning, stating that khipus represented "a language of animals". Many pendants contain fibres of two animals; for example, blue alpaca plied with dark brown guanaco, or yellow alpaca with dark brown vicuña. Colours include: yellow, red, blue, green, white, black, grey, purple, pink, orange, golden-brown, light brown, medium brown and dark brown (4), and combinations of up to four colours together (Figure 4).



Figure 4. Coloured pendants on Collata Khipu A. Note cayte at far left. Photo by author.

Local plants and insects provided dyes. Ply direction has been shown to be a semiotic feature signifying binary oppositions on khipus (Hyland 2014). In the two Collata khipus, pendants plied with a final S twist predominate, although a sizeable percentage have a final Z ply: S plied = 58%; Z plied = 42%. This variation in ply direction is in keeping with other animal fibre khipus, and is in contrast to cotton khipu cords. Among Inka and early colonial khipus, for camelid fibre cords, S plied = 59%, Z plied = 41%, whereas for cotton khipu cords, S plied = 97%, Z plied = 3%, revealing a minimal ply variation for cotton khipus (Urton and Brezine 2011). (5) In terms of colour, fibre, and ply direction, the carefully constructed Collata khipus

reveal an actual total of 95 pendant combinations, or symbols, for 487 pendants, with hundreds of combinations possible.

The complexity of Collata's epistolary khipus contrasts sharply with the regional accounting khipus. For example, the accounting khipu described by Mariano Pumajulka in 1935 (Hyland 2016) for the Huarochiri village of Santiago de Anchucaya contained only 12 unique pendants in terms of colour, fibre and ply direction. Accounting khipus appear to exhibit one of three possible pendant colour patterns: monochrome (Hyland 2014); colour banded (multiple pendants of one colour followed by multiple pendants of another colour); and seriation (a repeating sequence of colours) (Hyland 2016). In Anchucaya colour banded khipus, each band of colour represents an individual in a memorised sequence from senior to junior, while ply direction indicates gender. Information from multiple colour-banded khipus is summarised on seriated khipus, where pendant colours indicate lineage affiliation, and are arranged along the top cord according to a memorised sequence of tasks (Hyland 2016). Collata narrative khipus, however, do not form readily apparent patterns, as shown by the khipus' introductory sequences:

Khipu A introductory sequence (colour, fibre, ply direction):

Yellow, alpaca (Z)

Light brown, alpaca (S)

Dark brown/light brown, alpaca (Z)

Light brown, alpaca (S)

Blue/dark brown, alpaca/deer (Z)

Red, vicuña (Z)

Light brown, vicuña (Z)

Light brown, vicuña (S)

Dark brown/light brown, alpaca (Z)

Red, vicuña (Z)

Medium brown, vicuña (Z)

Medium brown, vicuña (Z)

Khipu B introductory sequence:

Light brown/ medium brown, vicuña (S)

Medium brown, vicuña (S)

White/orange, alpaca (Z)

Blue/red, alpaca (Z)

Blue/red, alpaca (S)

Light brown, vicuña (S)

Blue/medium brown, alpaca (Z)

Medium brown, vicuña (S)

Collata khipus lack the repetitive sequences of regional accounting khipus and exhibit a much greater variety of colour combinations, especially in conjunction with fibre variation.

If the Collata khipus were a logographic system, where each symbol represented a word, they should contain more symbols than they do, given the texts' lengths. Logosyllabic systems, which range from 80 to 800 symbols, have both phonetic and logographic symbols; the latter often encompass numbers and

determinatives, which clarify the meaning of phonetic signs. Logosyllabic writing frequently utilises rebus principles, such as those in Andean catechetical clay "cakes", whose origins are unknown, but which may date to the Inka period (Garcés and Sánchez 2016; Garcés and Sánchez 2015). Modern catechetical "cakes" represent prayers through items set into clay using rebuses. For example, a tuft of llama wool can represent the Spanish "*se llaman*" -- "they are called" -- because of the similarity between "llama" and "llaman" (Garcés and Bustamente Rocha 2014). Likewise, a blade of "*ichu*" grass often signifies "*Jesús*" because of the similarity of sounds. If the Collata khipus were logosyllabic, they presumably employed rebuses based on colour and animal names or qualities. Logosyllabic writing systems contain multiple redundancies, such as honorific versions of symbols for the same phoneme. However, they are more likely to under-represent the phonemes of the spoken language than alphabetic systems (Justeson 1976), so the same symbol may be used for similar but different morphemes. A multisyllabic rebus symbol may also contain superfluous syllables ignored when reading the text.

Epistles generally indicate the sender, often at the beginning or end of the text. It is hypothesized that the final cords of Khipu A, whose authorship is demonstrated by the lineage chief ribbons structuring the pendant groups, signify the lineage responsible for Khipu A. Eighteenth century handwritten letters in the Collata archival box indicate the sender at the end of the text, usually in the form of a signature. Likewise, Urton has suggested that the final cords on segments of Chachapoyas Khipu UR6 represent the lineages sending the information on each segment (Urton 2005). According to Collata authorities, Khipu A was created by the primary lineage, named *Alluka*, one of only two lineages in Collata today. In

accordance with the hypothesis that a khipu's ending cords may indicate the lineage sending the information on the khipu, we can match the final cords of Collata Khipu A with the lineage name thus:

Khipu A ending sequence

Dark brown wanaku (S) = **A**

White/dark brown, llama/wanaku (wrapped) (Z) = **LLU**

Blue llama (S) = **KA**

Ankas was the Huarochiri Quechua term for "blue" (Salomon and Urioste 1991); the phonetic value "ka", the first syllable beginning with a consonant, might possibly relate to the colour's name.

Do the proposed equivalences between the final cords of Khipu A and the syllables of ALLUKA allow us to decipher the following cords on the final sequence of Khipu B?

Khipu B ending sequence:

Dark brown wanaku (S) = **A**

Blue llama (S) = **KA**

Golden brown vicuña (S) = ?

The Quechua term for the golden-brown hue of the third cord is "*Paru*", likened to ripening corn tassels. This creates the word A-KA-PAR(U) or YAKAPAR, the name of one of Casta's only two lineages, conforming to the pattern of a lineage name at a

kipu's terminal end. This accords with the history of the villages as the twin centres of the 1783 Huarochiri revolt, and with Collata's oral history about the khipus. This proposed decipherment suggests that khipu pendants may possess standard syllabic values.

Khipu A was created in Collata, as demonstrated by the Collata lineage chief insignia ribbons structuring the cord groups, and the insignia bag. Andeans usually retained copies of important khipus, and Khipu A appears to be such a copy. According to the hypothesized decipherment of the ending cords, Khipu B was sent to Collata from Casta. Catholic missionaries were instructed to burn khipus in Casta in the early 17th century, yet khipu use there continued vigorously albeit clandestinely until the 1940s (6).

The Collata khipus are the first khipus ever reliably identified as narrative epistles by the descendants of their creators, an identification supported by the khipus' complexity compared to regional accounting khipus. A shared mnemonic system of such complexity presupposes a mutually comprehensible writing system, probably logosyllabic, apparently widespread among the people of Huarochiri province in the 18th century. The proposed association between Khipu A's last three cords and the lineage name yields a rational decipherment of Khipu B's ending cords, reinforcing the hypothesis that the Collata khipus represent logosyllabic writing. The author's ongoing ethnographic and archival research on the Collata khipus will hopefully result in further decipherments from these two corded texts.

The question remains, however, whether the Collata khipus represent a purely 18th century innovation, spurred on by contact with alphabetic writing, or whether they bear a close similarity to Inka period and early colonial era narrative

kipus. The approximately 800 extant khipus in museum collections, representing a tiny fraction of the 100,000s of khipus that existed during the Inka Empire, are generally made of cotton (85% of extant khipus are cotton; Urton and Brezine 2011, 329), have subsidiary cords, and lack the colour intensity and colour diversity of the Collata khipus. (This difference in colour intensity and variety probably results from cotton's inability to accept dyes as well as animal fibres do, and to fade more easily.) Furthermore, the most common colour patterns among extant khipus are colour banding and seriation, unlike the Collata khipus which have an anomalous colour pattern. If the Central Andean associations between colour banding and individual data, and seriation and aggregate data (Hyland 2016) hold true statistically for extant khipus, this would indicate that extant numeric khipus with these patterns were only for accounting, and not for recording narrative information.

The Collata khipus share the same overall structure with Inka period khipus - a top cord from which hang multicoloured pendants -- as well as the caytes, the introductory bundles or tufts. Additionally, Collata khipus exhibit features that Spanish chroniclers state were present in Inka khipus -- red deer hair and metallic threads -- but that are virtually absent from the extant Inka era and early colonial khipus (Radicati 2006, 68-9). According to chronicler Martín de Murúa, khipus were made from animal fibres, not from cotton, exhibited a diversity of vivid colours, and could record historical narratives with the same ease as European books (Murúa 1987, 373). Murúa's likely source of information, his mestizo confrere Juan Caballero, who resided in the Cusco house with Murúa and wrote his own history of the Inkas in Quechua based on traditional Inka historical poetry (Molina 1973-4, vol 2, 212) would have been familiar with Inka narrative khipus (7). Murúa's description

raises the possibility that there existed a large body of Inka era khipus made of animal fibres that is not well attested among extant khipus due, in part, to preservation bias. In other words, while all animal fibre khipus are severely underrepresented in the archaeological record (Urton and Brezine 2011), some of these Inka animal fibre khipus would have been for accounting, like those of Tupicocha (Salomon 2004) and Anchucaya (Hyland 2016), but others must have been narrative khipus such as those described by Murúa. Inka narrative animal fibre khipus from the highlands, including those from the Inka capitol of Cusco, may have resembled the Collata khipus, the first and only highland narrative khipus that have come to light.

In fact, khipus with characteristics very similar to the Collata khipus do exist in museum collections in small numbers. For example, Cipriani khipu No. 1, from a tomb in the Cusco region, consists of a top cord to which are attached vibrantly coloured woollen pendant cords in an anomalous colour pattern (Radicati 2006, 87-8), like the Collata khipus. Unfortunately, in the 1990s this particular khipu was classified as a forgery because it did not conform to the standard for Inka khipus set by Peruvian cotton coastal khipus (Loza 1999, 51-4). At that time, khipus judged to deviate too much from "standard" coastal khipus (exemplified by a coastal cotton khipu, VA4319, Berlin) were declassified as khipus in the Berlin Ethnological Museum, the world's largest repository of khipus (Loza 1999); anecdotal evidence suggests that similar purges have occurred in other museum collections of khipus. It would be useful to re-analyse these anomalous animal fibre khipus in light of the new data from the Collata khipus.

The Collata khipus reveal the extent to which twisted and coloured cords can encode logosyllabic texts. As such they represent the extraordinarily sophisticated communication system used in colonial Huarochiri. There is ethnohistoric evidence that the Inkas in the capitol of Cusco may likewise have relied primarily on brightly coloured animal fibre khipus to preserve their histories. Further research will advance our understanding of the degree to which the Inkas, the largest and most powerful indigenous empire of the Americas, possessed an intelligible writing system, one possibly related to the epistolary khipus of Collata.

Notes:

1. Scholars have examined how semiotic practices in the Andes have been spread across an array of intricate textile forms; see, Arnold 1994, 2014; Brown Vega 2016; Cereceda 1986; Dransart 2014; Femenías 1987; Franquemont 1986; Lau 2014; Silverman 2008; Splitstoser 2014. Pärssinen has argued that Inka khipus recorded phonemes (Pärssinen 1992).
2. In 2015, the community authorities of Casta allowed me to photograph their sacred ritual text, the Entablo, describing their irrigation canal cleaning ceremony. According to the manuscript, written between 1921 and 1947, khipu cords played a central role in recording contributions of labour and goods until the 1940s. In 1922, Tello witnessed the use of khipu cords attached to boards as part of this ceremony,

although he observed only one instance of their use (Tello and Miranda 1923; *El Entablo*, 1921 - 1947. Manuscript, Casta community archive, 60 pages).

3. The Peruvian Viceroy, Agustín de Jáuregui, described the rebellion in a letter dated July 16, 1783 ("Carta no. 250 de Agustín de Jáuregui", July 16, 1783, Lima, 663, no. 24, Archivo general de las Indias, Seville). He wrote that the communities "in sedition" were the three villages in the *repartimiento* of Chaclla -- Collata, Chaclla, and Jicamarca. At this time, Collata was the largest of the three villages, with a population double that of either Chaclla or Jicamarca ("Informe por don Sebastián Bargas, alcalde ordinario de Collata", April 22, 1746, Collata community archive). On July 12, 1783, the local *corregidor* in Huarochiri, Felipe Carrera, wrote an account of the rebellion in which he stated that Casta was the other centre of the uprising (Carrera 1836).

4. This quadripartite division of 'brown' is found in the unpublished field notes of Julio C. Tello, the native Quechua speaker and anthropologist from Huarochiri. His fieldnotes on khipus contain hundreds of hand coloured drawings of khipus and a description of one Inka style khipu from Casta. Tello subdivided the shades of brown on khipus in the manner here: golden brown (*paru*), light brown, medium brown, and dark brown. Archivo Tello, Centro Cultural de la Universidad de San Marcos, Lima, Peru.

5. Knot direction also indicates binary oppositions (Hyland 2014; Hyland, Ware and Clark 2014); however, due to deterioration, 75 % of Collata khipu pendants lack end-knots.

6. Archbishop Lobo Guerrero, in his 1610 authorization granting Francisco de Avila the power to extirpate idolatries in the Lima diocese, instructed Avila to seek out

and burn khipus as his first act when entering each new village: "y para que en todos los pueblos donde llegarides tengais cuydado de mandar quemar los quipos y quenta" (Bartolomé Lobo Guerrero. 1610. Testimony, ms. Archivo General de las Indias, Lima, 220, no. 7, ff 35r-35v). The continued use of khipus in Casta is discussed in note 2.

7. I have been able to ascertain that Murúa lived with the chronicler Juan Cabellero in the Cusco Mercedarian house while Murúa wrote his Inka history. The Mercedarian chronicler Gabriel Tellez (Tirso de Molina), who had access to unpublished letters and reports from Peru, described Cabellero's accomplishments: "Escriuió vn libro grande en la lengua particular de el Cuzco, que contenía la antigüedad y prosapia de los Yngas y los demás Curacas ... Todo el tal libro está adornado de sabrosos versos y eloquentes prossas, aquéllos con sus consonantes y cadencias, y estotras con dulce estilo y elegancia" (Molina 1973-4, vol 2, 212).

References:

Arnold, Denise. 1994. Hacer al hombre a imagen de ella. *Revistas Chungará* 26(1): 79- 115.

Arnold, Denise. 2014. Textiles, knotted khipus, and a semiosis in common. In: *Textiles, Technical Practice and Power in the Andes*. Denise Arnold and Penelope Dransart, Eds. London: Archetype Publications.

Boone, Elizabeth. 2011. The cultural category of scripts, signs, and pictographies. In *Their Way of Writing*. Elizabeth Boone and Gary Urton, Eds. Pp. 379-390. Washington DC: Dumbarton Oaks.

- Brokaw, Galen. 2010. *History of the Khipu*. Cambridge: Cambridge University Press.
- Brown Vega, M. 2016. Ritual practices and wrapped objects. *Journal of Material Culture* 21(2): 267-272.
- Carrera, Felipe. 1836 [1783]. Oficio de Don Felipe Carrera ... 1783, In *Coleccion de obras y documentos relativos a la historia*, vol. 5. P. Angelis, ed. Pp. 191-194. Buenos Aires.
- Cereceda, Verónica. 1986. The Semiology of Andean Textiles. In: *Anthropological History of Andean Politics*. J.V. Murra, N. Wachtel and J. Revel, Eds. Pp. 149-173. Cambridge: Cambridge University Press.
- Conklin, William. 2002. A Khipu Information String Theory, In: *Narrative Threads*. J. Quilter and G. Urton, Eds. Pp. 53- 86, Austin: University of Texas Press.
- Curatola Petrocchi, Marco, and José de la Puente Luna, Eds. 2013. *El quipu colonial*. Lima: PUCP.
- Dransart, Penelope. 2014. Thoughts on productive knowledge in Andean weaving with discontinuous warp and weft. In: *Textiles, Technical Practice and Power in the Andes*. Denise Arnold and Penelope Dransart, Eds. London: Archetype Publications.
- Femenías, Blenda. 1987. *Andean Aesthetics*. Madison, WI: Elvehjem Museum of Art.
- Franquemont, Christine. 1986. Chinchero Pallays. In: *The Junius B. Bird Conference on Andean Textiles*. Ann Pollard ed. Washington DC: The Textile Museum.
- Garcés, Fernando and Marco Bustamente Rocha. 2014. *Lutrina Timpu*. Cochabamba, Bolivia: Universidad de San Simón.
- Garcés, Fernando and Walter Sánchez. 2015. *Textualidades*. Cochabamba, Bolivia: Universidad de San Simón.

- Garcés, Fernando and Walter Sánchez. 2016. Inscripciones y escrituras andinas. *Boletín del Museo Chileno de Arte Precolombino*, 21(1), 115-128.
- Given-Wilson, Chris. 2016. Bureaucracy without alphabetic writing. In *Empires and Bureaucracy in World History*. Peter Crooks and Timothy H. Parsons, eds. Oxford: Oxford University Press.
- Hyland, Sabine. 2014. Ply, markedness and redundancy. *American Anthropologist*, 116:3, 643-8.
- Hyland, Sabine. 2016. How khipus indicated labour contributions in an Andean village. *Journal of Material Culture* 21(4), 490-509.
- Hyland, Sabine, Gene A. Ware, and Madison Clark. 2014. Knot direction in a khipu/alphabetic text from the Central Andes. *Latin American Antiquity*, 25:2, 189-197.
- Justeson, John S. 1976. Universals of language and universals of writing. In *Linguistic Studies Offered to Joseph Greenberg*. A. Juillard, ed. Pp. 57-94. Saratoga, CA: Anima Libri.
- Kaufmann Doig, Federico. 1973. *Manual de arqueología peruana*. Lima: Editorial Peisa.
- Lau, George. 2014. On Textiles and Alterity in the Recuay Culture (AD 200 - 700), Ancash, Peru. In: *Textiles, Technical Practice and Power in the Andes*. Denise Arnold and Penelope Dransart, Eds. London: Archetype Publications.
- Loza, Carmen Beatriz. 1999. Quipus and Quipolas at the Museum für Völkerkunde, Berlin. *Baessler-Archiv, Neue Folge*, Band XLVII, 39-75.
- Mackey, Carol. 2002. The continuing khipu tradition. In *Narrative Threads*. Jeffrey Quilter and Gary Urton, eds. Pp. 321-347. Austin: University of Texas Press.

- Molina, Tirso de (Gabriel Téllez). 1973-4. *Historia general de la Orden de la Nuestra Señora de las Mercedes*. Manuel Penedo Rey, ed. 2 vols. Madrid: Provincia de la Merced.
- Murúa, Martín de. 1987. *Historia general del Perú*. Manuel Ballesteros, ed. Madrid: Historia 16.
- Pärssinen, Martti. 1992. *Tawantinsuyu: The Inca State and Its Political Organization*. Helsinki: SHS.
- Pimentel H., Nelson. 2005. *Amarrando colores: La producción del sentido en khipus aymaras*. La Paz: CEPA, Latinas Editores.
- Platt, Tristan. 2015. Un Archivo campesino como "Acontecimiento de Terreno": Los nuevos papeles del Curaca de Macha. *Americania (Seville)*. no.2, 158-185.
- Radicati di Primeglio, Carlos. 2006. *Estudios sobre los quipus*. Lima: Universidad Nacional de San Marcos.
- Rappaport, Joanne and Tom Cummins. 2011. *Beyond the Lettered City*. Durham, NC: Duke University Press.
- Rezaval y Ugarte, Joseph. 1783. *En la causa criminal ... contra los rebeldes principales Felipe Velasco Tupac Inga Yupangui y Ciriaco Flores*. Lima.
- Sala i Vila, Núria. 1995. La rebelión de Huarochirí de 1783. In *Entre la retórica y la insurgencia*. Charles Walker, ed. Pp. 273-308. Cuzco, Peru: CBC.
- Salomon, Frank. 2001. How an Andean "writing without words" works. *Current Anthropology*, 42:1, 1-27.
- Salomon, Frank. 2004. *The Cord Keepers*. Durham, NC: Duke University Press.
- Salomon, Frank, and Mercedes Niño-Murcia. 2011. *The Lettered Mountain*. Durham, NC: Duke University Press.

- Salomon, Frank and George L. Urioste. 1991. *The Huarochiri Manuscript*. Austin: University of Texas Press.
- Salomon, Frank, Carrie J. Brezine, Reymundo Chapa, and Victor Falcón Huayta. 2011. Khipu from Colony to Republic. In *Their Way of Writing*. Elizabeth Boone and Gary Urton, eds. Pp. 353-378. Washington DC: Dumbarton Oaks.
- Silverman, Gail P. 2008. *A Woven Book of Knowledge*. Salt Lake City, UT: University of Utah Press.
- Spalding, Karen. 1984. *Huarochiri*. Stanford CA: Stanford University Press.
- Splitstoser, Jeffrey. 2014. Practice and meaning in spiral-wrapped batons and cords from Cerrillos. In: *Textiles, Technical Practice and Power in the Andes*. Denise Arnold and Penelope Dransart, Eds. Pp. 46-82. London: Archetype Publications.
- Szeminski, Jan. 1987. Why Kill the Spaniard? In: *Resistance, Rebellion, and Consciousness in the Andean Peasant World*. Steve Stern, Ed. pp. 166-192. Madison: University of Wisconsin Press.
- Tello, Julio C. and Próspero Miranda. 1923. Wallallo: Ceremonias gentílicas. *Inca*, **1**, 475-549.
- Uhle, Max. 1897. A Modern Kipu from Cutusuma, Bolivia. *Bulletin of the Free Museum of Science and Art*, 1(2): 51-63.
- Urton, Gary. 2003. *Signs of the Inka Khipu*. Austin: University of Texas Press.
- Urton, Gary. 2005. Khipu Archives. *Latin American Antiquity*, **16**:2, 147-167.
- Urton, Gary and Carrie Brezine. 2011. Khipu Typologies. In *Their Way of Writing*. Elizabeth Boone and Gary Urton, eds. Washington DC: Dumbarton Oaks.

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