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Knitted threads of silence: Anatolian stockings as techno-aesthetic tacit media

Ebru Kurbak
University of Applied Arts Vienna

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Abstract

In mainstream histories of technology, the connection between textiles and information technology has typically been reduced to the influence of Joseph Marie Jacquard's weaving loom on Charles Babbage and Ada Lovelace's early conception of computing in the 19th century. However, narratives of textile practices encoding information – real or imagined – exist beyond weaving and the Western context, suggesting a more fundamental relationship between fiber-based manufacturing and data inscription.

This article examines the hand-knitted stockings of Anatolia, used by illiterate and oppressed women to inscribe messages through visual symbols. Besides depicting natural phenomena such as regional plants, animals, and everyday objects, Anatolian women used these symbols to express social and family affiliations and their repressed feelings, desires and opinions. This created a medium for an indirect, tacit form of expression that helped them navigate strict social rules. The research delves into the historical and cultural contexts of these understudied textiles, drawing on scarce written sources to situate the knitted stockings in the broader context of textile encoding, gender and power. The findings aim to provoke further interdisciplinary interest in textile-based inscription techniques, enriching the historiography of media and computational technologies.

Keywords

textiles, knitting and coding; visual symbols; gender and power; tacit media; media archaeology

Hebras de silencio: medias anatolias como medios tácitos tecnoestéticos

Resumen

En las historias dominantes de la tecnología, la conexión entre los tejidos y la tecnología de la información se ha reducido normalmente a la influencia del telar de tejido de Joseph Marie Jacquard en la concepción temprana de la informática de Charles Babbage y Ada Lovelace en el siglo XIX. Sin embargo, existen narrativas de prácticas textiles que codifican información, reales o imaginadas, más allá del tejido y el contexto occidental, lo que sugiere una relación más fundamental entre la fabricación basada en fibra y la inscripción de datos.

Este artículo examina las medias tejidas a mano de Anatolia, utilizadas por mujeres analfabetas y oprimidas para inscribir mensajes a través de símbolos visuales. Además de representar fenómenos naturales como plantas regionales, animales y objetos cotidianos, las mujeres anatolias utilizaron estos símbolos para expresar afiliaciones sociales y familiares y sus sentimientos, deseos y opiniones reprimidas. Esto creó un medio para una forma de expresión indirecta y tácita que les ayudó a navegar por reglas sociales estrictas. La investigación profundiza en los contextos históricos y culturales de estos tejidos poco estudiados, recurriendo a las escasas fuentes escritas para ubicar las medias de punto en el contexto más amplio de la codificación textil, el género y el poder. Los resultados tienen como objetivo provocar un mayor interés interdisciplinar en las técnicas de inscripción basadas en tejidos, enriqueciendo la historiografía de los medios y las tecnologías computacionales.

Palabras clave

textiles, tejidos y codificación; símbolos visuales; género y poder; medios tácitos; arqueología de medios

Introduction

At a time when multi-perspective approaches to media cultures and histories are considered crucial, how diverse is today's diverse media thinking? What insights can excavations of yet understudied non-normative, minor media cultures offer about alternative ways of knowing and inscribing, and about potentially existing hierarchies among the marginalized? What media content, forms and producers have been less favoured among the disfavoured in the past few decades, and why? This paper introduces one such medium that might provide new insights: the hand-knitted stockings of Anatolia.

Patterned wool stockings, typically calf or knee-length, knitted in Anatolian villages within the borders of present-day Turkey, have long been known locally for their historical use by oppressed and mostly illiterate women to encode information through visual symbols (Özbel 1976, 3). In addition to knitting motifs depicting physical phenomena such as regional plants, animals and objects of daily use, women invented and integrated motifs into their knitting to express information about social and family affiliations as well as their repressed feelings, desires and opinions. Since handmade stockings also functioned as a gift object, they were used to practically communicate messages over long distances, sent by women to their current or future partners and their families. The motifs incorporated into this medium of long-distance communication typically dealt with topics that were considered shameful to express verbally for a woman, such as love, marriage, readiness, consent, dissent, pregnancy and childbirth. Aiming to provide an introduction to this very particular medium for possible future studies, the following non-exhaustive text is a mere scratch on the surface of a "silent language" or "illegible inscriptions of a forgotten alphabet" (Özbel 1976, 3).

Figure 1. Photographs of a pair of stockings from the village of Uluğbey in Isparta, Turkey. Hand-knitted and gifted by the author's aunt. Top view (left) and base view (right)
Source: photo by the author

1. Mapping the field

To speak of "knitted stockings of Anatolia" may sound like a broad generalization, as the region called Anatolia (also known as Asia Minor) has been home to an immense variety of cultures, ethnicities, religions and regimes for thousands of years. It is important to note that the medium of study here is not a singular material cultural product, but rather a collection of comparable fragments. The diversified ethnographic practice has been developed and spread throughout the entire geography through years of interaction between the nomads of the Turkmen and Yuruk tribes and the various indigenous peoples in the region.

Written sources about the medium are unfortunately scarce, as the people relied on a largely oral culture, making it difficult to delineate the subject in both space and time. In addition, knitting was considered primarily women's work, with the exception of male knitters among nomadic tribes and shepherds. As a product of women's cultures, and especially of nomadic women, stockings have remained largely understudied in the region. Unlike kilims and carpets, which are prized Oriental market goods, stockings have also escaped Western attention probably because of their perceived lower value. However, some written information about knitted stockings can be gathered from local, non-academic ethnographic studies and first-person recorded observations and from a handful of original texts that recognize their importance as cultural heritage and go beyond mere technical knitting instructions.

In the midst of this scarcity, the most invaluable resource available to us today is a book entitled *Türk Köylü Çorapları* (*Turkish Villager Stockings*), written in 1976 by Kenan Özbel, an artist, art educator and collector (Özbel 1976). In addition to the book, Özbel left a substantial collection of Anatolian stockings, which is currently housed in the Rare Works Collection of the Library of the Faculty of Fine Arts at Marmara University in Istanbul. Özbel's work is considered the most comprehensive study, providing insights from various regions of Anatolia, elucidating common knitting techniques, stocking pattern layouts, integrated motifs, their names and their intended meanings. The book was later translated into English and published in 1981 under the title *Knitted Stockings from Turkish Villages* (Özbel 1981). Özbel's research began as early as the 1940s, during his term as an art teacher at various high schools throughout Anatolia, including a Technical Training College for Girls in Ankara (Kız Teknik Öğretim Olgunlaşma Enstitüsü), where traditional decorative crafts were taught. Between 1947 and 1949, Özbel edited 16 pamphlets published by the Cumhuriyet Halk Partisi (CHP), Turkey's social democratic political party. One of these pamphlets dealt with knitted stockings (Özbel 1945). This particular issue sparked a broader investigation for Özbel, leading to its expansion into a book, without which we would have little recorded information on the subject.

Another resource deserving recognition for both content and the unique circumstances of its creation is Betsy Harrell's book, *Anatolian Knitting Designs* (Harrell 1981). Harrell's book documents a study conducted between 1968 and 1978 that followed women knitters in the Hisar Üstü neighborhood of Istanbul, then a squatted shantytown. These women, migrants from Anatolia, had settled on the outskirts of Istanbul through a form of squatting known as *gecekondu* ("landed in the night") by which families built makeshift homes overnight. Harrell worked with women who were engaged in a collective cottage industry. Having learned the craft from their mothers, they knitted stockings similar to those made in the Sivas region. Harrell's work complements Kenan Özbel's research. Through detailed documentation of techniques and motifs and interviews with the women, she captures a moment when the craft persists but the meanings of the symbols have diminished. Despite the striking similarities in the motifs, the women who knit them in the 1970s in Istanbul were neither aware of their former meanings nor felt the need to communicate through this medium.

Finally, the article titled "Türk El Sanatlarından El Örgüsü Çoraplar" (Hand Knitted Socks of Turkish Crafts), by art historian Örcün Barışta, was written in 1986 with the aim to revive the knowledge of knitted socks as a neglected medium (Barışta 1986). The article synthesizes information from both the aforementioned sources and other fragmented records. Barışta studied the stockings in the Kenan Özbel Collection to identify the tools, motifs, form, composition and color characteristics of the craft. Available only in Turkish, this study is significant as the first scholarly work and provides a concise, collected overview of historical knitting pattern terminology and scattered references regarding the subject.

From existing studies, mostly from the period between 1935 and 1985, it can be deduced that women's practice of knitting as a medium of expression was common at the turn of the 20th century up until the 1980s. The practice seems to have been geographically widespread, as the samples in the studies overviewed for this paper were collected from scattered villages and nomadic tribes around cities such as Ankara, Çankırı, Çanakkale, Bursa, Çorum, Tokat, Adapazarı, Niğde, Malatya, Sinop, Konya, Kayseri, Kütahya and Amasya, with the majority of the samples studied coming from around Sivas. Additionally, according to my own contextual knowledge from my early personal experiences in the 1980s, the practices were also carried out in Midwestern Anatolia in villages around Aydın, Afyon, Isparta, Burdur and Antalya.

Figure 2. A map of Anatolia with the cities listed above marked on it
Source: own creation

Unfortunately, conducting direct original research today presents significant challenges, due to the gradual decline of practices since the 1950s. Factors influencing this decline include large-scale rural-urban migration in Turkey beginning in the 1950s and the legislative shift from an inward-looking mixed economy to an outward-looking free trade economy around the 1980s. The subsequent relaxation of import and export barriers in Turkey towards the 1990s affected the perceived value of locally produced goods, ultimately displacing durable, handmade local products with imported fast-fashion consumer goods. Additionally,

significant social changes in women's lives occurred as the urban population gradually increased. Practices of bridal dowry-making and women's domestic handicrafts declined as women gained increased opportunities for formal education and attained working lives. This increases the value of the recordings made around the mid-20th century even more drastically.

2. Towards a hardware theory of textiles

Before exploring Anatolia's knitted stockings in greater detail, it would be useful to establish the larger context of textiles as understudied hardware for inscription. Textiles have always been deeply intertwined with encoding, recording and processing information; however, this aspect has been overlooked in mainstream histories of media technology. In narratives of computing history, for example, the complex relationship between textiles and modern information technology is often reduced to a simplistic anecdote centered on Joseph Marie Jacquard, Charles Babbage and Ada Lovelace. While this anecdote holds some truth, it tends to obscure the fundamental connection between textile manufacturing and information coding. Recent scholarship has addressed this oversight by focusing specifically on weaving, exploring concepts such as "textile processing" (Schneider 2007) in pre-punch card looms, and considering prehistoric weaving as a "binary art" or "technical mode of existence" (Harlizius-Klück 2017) long before Jacquard's automatization of the loom. Textile construction techniques other than weaving have received less attention, obscuring the profound relationship between fiber-based manufacturing and information processing in general.

Textiles, we are told, have been women's work for thousands of years (Barber 1995, 29), yet the true prehistory of these practices was long obscured. One reason is the perishable nature of textiles, as soft natural fibers cannot survive for thousands of years. Traditional biases due to gendered divisions of labour have also played a role in overlooking the textile tools that have survived. In 19th century Europe, textile handcrafts were projected not only as decorative, domestic and trivial but also as strictly feminine activities, leading early archaeologists (mostly men) untrained and uninterested in textiles to overlook, ignore or even discard textile-related artifacts (Barber 1992, xxiii). It took considerable time for archaeologists with trained eyes in textiles to access the field and develop novel methods to reveal this obscured history. The invention of string some 15,000 years ago catalyzed a "String Revolution" as significant as the Industrial Revolution, enabling major technological advances for humanity (Barber 1995, 42-70). This prehistoric techno-revolution is finally being studied by archaeologists around the world (Barber 1992; Barber 1995; Gleba &Mannering 2019; Gleba 2022; Grömer *et al.* 2016).

It can be argued that a similar dismissal of textiles has occurred in 20th-century media theory and historiography. The emergence of media materialist thinking, which provides a rich basis for us to examine the media specificity of textiles today, ironically contributed to the dismissal of textiles in the past. Media materialism (aka. German media theory, or hardware media theory), along with media archaeology, centralized hardware as the critical element in configuring media and their agency in the distribution of power. Influenced by Foucault's notion of archaeology, the physical construction and workings of media is so central to this point of view that, in the end, "there is no software" (Kittler 2014). The task awaiting a media theorist or media artist, then, is figuring out how power is circulated and reproduced in "the switches and relays, software and hardware, protocols and circuits of which our technical media systems are made" (Parikka 2012, 70).

If, no matter how complex the code, media's linguistic extension still amounts to a hardware configuration, those who can carry out research are the ones "prepared to tackle what goes on inside the machine," equipped to take up "digging into how technologies work" (Parikka 2012, 89, 164). In the 20th-century Western world, where skills were spatially and socially segregated based on gender, class, ethnicity and age, most experts who initially wrote about the inner circuits of conventional digital media might not have typically been the same people acquainted with the inner workings of textiles. The missing hardware theory of textiles, it can be argued, has been in development since the turn of the millennium through contributions from various situated positions.

3. Textile encoding

Since the invention of spinning in prehistory, textile techniques have become sophisticated methods of organizing matter in three-dimensional space. While many people use terms such as weaving or knitting interchangeably and group these techniques together, each method organizes matter in a unique way. The similarity among the techniques lies in the type of materials used. J. J. Gibson, in the *Ecological Approach to Visual Perception*, proposed a category of objects for such materials, that he called "fibers," along with other categories: "sheets", "sticks", "containers", "clothing" and "tools" (Gibson 1986, 133). Fibers are elongated, flexible, and have a relatively small cross section relative to their length. They offer unique affordances, according to Gibson, such as knotting, binding, lashing, knitting and weaving.

There is, however, I would argue, another remarkable affordance of fiber-based structures: their inherent ability to store and visualize information within their composition. Textile-making processes using fibrous materials are unique in that, unlike clay particles, for example, fibers do not fuse together during manufacture. Therefore, in a textile object – with the possible exception of felted objects – we can trace the paths of the fibers, observe the order in which they overlap, and even unravel textile objects, reverse-engineer them and reveal the very actions of the maker. At the most basic level, then, it can be said that every textile object stores information about its own production process. If the maker has intentionally encoded information through their actions, we can begin to speak of decipherable data within the textile object that can be decoded by a subject familiar with the syntax.

This remarkable ability of fibers becomes apparent even in the initial step of thread spinning after natural fibers are extracted from animals or plants. Natural fibers are spun into workable threads using hand spindles, spinning wheels or industrial spinning machines before being used in textile construction. The rarely preserved fragments of thread found at ancient sites were spun with hand spindles. Archaeologists categorize these threads according to the direction of spin (Barber 1992, 65-66). Named after the letters S and Z, where the slope in the thread corresponds to the slope in the center of each letter, the spin direction refers to whether the hand spindle was turned clockwise or counterclockwise during spinning (Figure 3). Thus, by simply examining a thread hand-spun several thousand years ago we can decipher the actions of the spinner. This inherent characteristic of individual raw fibers also manifests itself at the scale of threads, as they undergo more complex manipulation processes such as knotting, netting, braiding, knitting, weaving and so on.

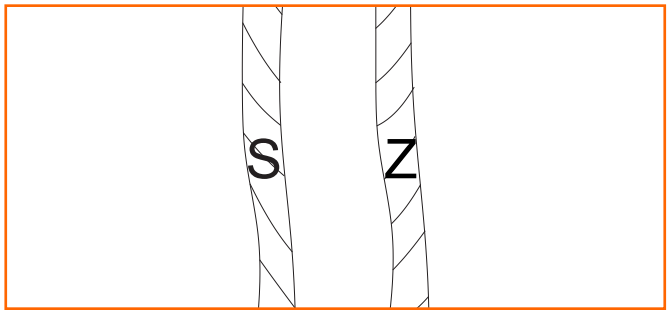

Figure 3. The *S* and *Z* directions of spinning
Source: own creation

It is this extraordinary property of textiles, I would argue, that has been instinctively utilized in locally invented textile inscription technologies around the world, such as the *Quipu* of the Andean Empire, which are attested to have served as censuses and complex records of resources (Salomon, 2004, 11), or the *ititamat* (time ball) of the Klikitat and Yakama women of Northwestern America, which were balls of knotted strings that served as personal diaries and mnemonic devices (McCarty 2014, 95). A comprehensive overview of these technologies is beyond the scope of this paper. However, a closer look at some instances that utilize "knitting" would be useful as a context for Anatolian knitting practices.

4. Knitting, data and power

Knitting, technically speaking, is the twisting and knotting of a single thread over itself, performed with a crochet hook or two or five knitting needles (Barışta 1988, 92). When performed as flat knitting with two needles, it allows for the creation of flexible and stretchable planes. When performed with one hook or five needles, it allows for the creation of three-dimensional objects, such as socks in the round, similar to modern additive three-dimensional printing processes (Figure 4).

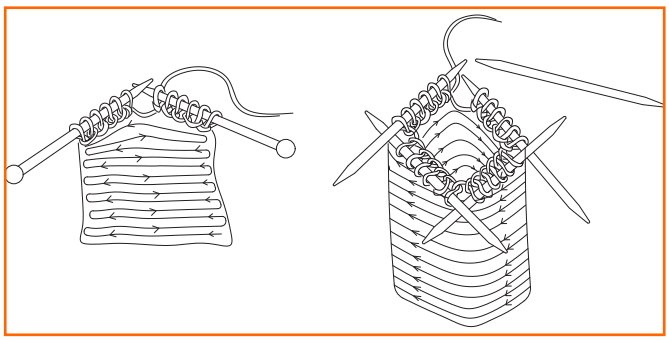

Figure 4. Two-needle and five-needle knitting
Source: own creation

Unlike multi-element techniques such as weaving, which require multiple strands of yarn and complicated equipment, knitting is a single-element technique. It allows makers to construct objects with a single ball of yarn and very few tools. This versatility has made knitting the technique of choice in some nomadic cultures and as a form of casual women's work suitable to take on during social gatherings and in public spaces. Knitting allows knitters to engage in conversation or listen to others while knitting. It is not a mere manufacturing technique, but a "culture" that had historically been firmly gendered and conceived as a leisurely activity that has taken on multiple meanings and functions in more recent social and regional histories (Turney 2009).

Examples of knitting as a data practice – both real and imagined – commonly use the versatility and underestimation of knitting as a hidden power for disguise. Knitting can be used as "a cover, a literal means of hiding" (Turney 2009, 202). It can easily become a natural medium for "steganographic textiles" where women use their knitting skills as a means for "hiding information in plain sight" (Kuchera 2021).

The most referenced example of such secret knitting/coding practice, albeit fictional, is in *A Tale of Two Cities* by Charles Dickens. Early in, Dickens introduces Madame Defarge, a character who knits day and night in her husband's wine bar. It is not until later in the novel that we learn that she actually uses knitting for purposefully storing information, aligning herself as a passionate supporter of the French Revolution. Defarge meticulously records the identities of aristocrats marked for execution, making her knitting an ingenious mechanism for preserving information together with her fellow *tricoteuses*. "All the women knitted. They knitted worthless things; but the mechanical work was a mechanical substitute for eating and drinking;" wrote Dickens, describing the women who sat "knitting, knitting, counting dropping heads" (Dickens & Maxwell 2011, 193-194).

Examples of knitting/coding practices can be broadened. The American author Jeannette Lee's detective novels, written in the early 20th century, feature the character of Millicent Newberry, a knitter-private investigator who appears to be casually knitting while listening to her clients but is, in fact, taking notes to solve crimes (Lee 1917). Allegedly, during World War II, elderly women who lived near train lines and could watch the German movements helped the Belgian Resistance by recording the types of trains that passed by

in their knitting (Napoleoni 2020, 61). Similarly, the British "knitting spy" Phyllis Latour Doyle, who was parachuted into Normandy during WWII, informed British officers about the movements of German soldiers by first recording the information in her knitting in Morse code and then transmitting it via radio from different locations (Napoleoni 2020, 62). Such knitting/coding practices are also appropriated today by many creative practitioners, as in Kristen Haring's knitted Morse code pieces, for instance (Haring 2011).

In most of the examples, we do not know exactly how knitting/coding works. In the example of Madame Defarge, while Dickens does not provide specific details about the pattern used, it is clear that the code registers names, heights, hair colors and significant physical characteristics of individuals (Dickens & Maxwell 2011, 183-184). This, however, can be done in multiple ways, as knitting, characterized by horizontally and vertically interlocked stitches in a grid, offers multiple opportunities for coding (Figure 5).

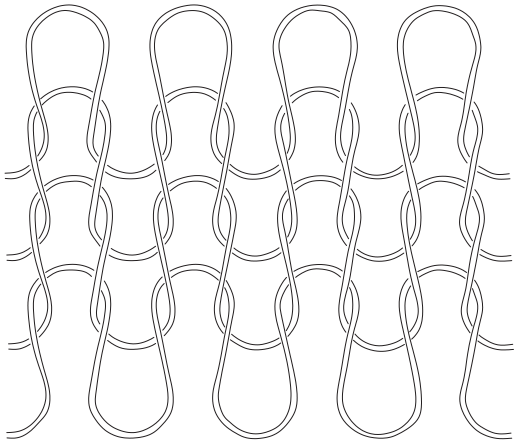

Figure 5. The construction of a knitted object
Source: own creation

Strictly speculating, Madame Defarge may be using a binary system in her knitting. If she is using a single colour thread, she may be using purl and knit stitches to represent ones and zeroes, determined by the direction of the knitting needle as it enters each stitch. If she is using two colours, she could be doing the same thing, using each colour to represent the ones and zeroes. The binary system can then be used to encode speech-based information using another system, such as Morse code. Alternatively, she may be using a visual symbol-based coding system, utilizing the knitted surface as a low-resolution pictorial surface, stitches resembling pixels on a screen. The different symbols may be representing different alphabetic letters or directly representing different features of the visual appearance of people.

In all these cases, regardless of the preferred method of encoding, knitting is a covert activity in which the message remains indecipherable to the untrained eye. Women's ability to hide information in plain view owes to the very fact that the activity of knitting is not perceived as an intellectual pursuit by those in positions of power in those times and places. The messages can only be deciphered by people who are aware that a piece of knitting can be a data storage device and are familiar enough with the syntax used by the knitter.

5. Knitted Anatolian stockings: structure, pattern and context

Residing in this larger context of knitted inscriptions, Anatolian stockings are modified tubular-shaped objects knitted with five needles, crafted by women but worn by everyone. Early examples were thick stockings made of naturally dyed wool or combed and spun wool and cotton, with the occasional addition of human hair and bridal metal threads, dating back to the 19th century (Barışta 1988, 93). While stocking knitting varies across Anatolia, women typically begin with the toe section, progress to the foot and ankle, and end with the top of the stocking. Occasionally, the heel is knitted as a final step to complete the process.

Stockings come in a variety of patterns. Multicoloured stockings, which are the focus of this article, can have a large single motif in the center or smaller motifs repeated in decorative stripes that can be arranged in different ways on the stocking (Figure 6). They can be placed diagonally, vertically, horizontally or in various combinations of these. Knitters freely choose the motifs and design of the overall composition for each unique stocking, choosing from local motifs according to their preferences, moods and desires. As a result, the stocking designs share common qualities and meanings, while pattern arrangement allows for individual expression and storytelling.

Figure 6. "Diagonal", "horizontal" and "central motif" layout examples
Source: own creation (based on Özbel 1945)

Recurring visual symbols, referred to as motifs in textiles, are the core of the Anatolian inscription system. The motifs emerge from a vast library of symbolic forms created over the centuries. The most common symbols seem to have emerged from local environments and natural and social events. Commonly depicted plants include roses, wheat, violets, clover, ivy, walnuts and various tree leaves. There are also depictions

of animals such as caterpillars, houseflies, butterflies, bats, worms, ostriches, wolves, cranes, crows and mosquitoes. Many symbols resemble common objects found in village environments, such as spindles, tables, slippers, ox carts, scythes, pitchers and evil eye beads, as well as natural entities such as stars and the moon. In addition, there are motifs known as *damga* (stamp), which identify tribes or families, informing about the social identity of the wearer. Some motifs denote social class or occupation, such as corporal, sergeant or headman. Others are believed to have protective powers or serve as good luck charms. Many of these motifs are similar to kilim motifs of the region, albeit adapted or reimagined to fit the specific constraints of the knitting medium (Figure 7).

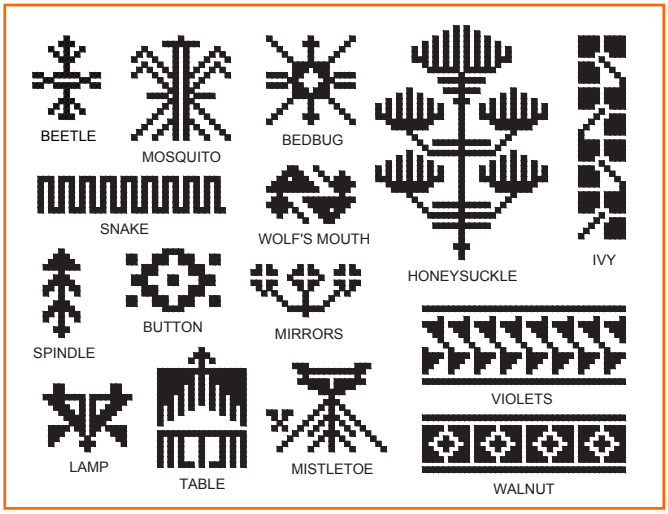

Figure 7. Examples of motifs resembling animals, plants and common objects
Source: own creation (based on Özbel 1981)

Finally, the most intriguing category of motifs for this paper are the symbols that represent life events, communicative phrases or messages. These include symbols representing an orphaned girl, a woman's independent consent to marriage, a family's approval of their daughter's marriage, a family's disapproval of the girl's marriage, pregnancy, the sex of the newborn child and symbols representing phrases such as "follow me" (Figures 8-13).

Figure 8. The motif indicating an orphaned young woman

Figure 9. The sign indicating a young woman's consent

Figure 10. The motif indicating that a young woman will not be given away in marriage

Figure 11. The pregnancy sign

Figure 12. The child born is a boy

Figure 12. The child born is a boy. Sources of all images from 8-13: handknitted by the author according to a reference pattern (Özbel 1976, 14)

The surviving motifs of Anatolia, some of which are exemplified here, have been developed and refined by countless women experts in knitting over centuries. Knitting – as hardware, so to speak – has its own very particular constraints in visual symbol construction. The grid structure of the stitches may seem to allow any pattern to be created within the resolution constraints much like painting pixels on a screen, but this is not entirely the case. Knitting, unlike painting on a surface, involves creating the very surface that holds the image. Thus, there are structural constraints that make pattern creation a complex process. The knitter, while designing the visual symbol, must also consider the physical stability of the knitted object.

In two-colour knitting, as seen in Anatolian stockings, two different strands of yarn are used. The colour that is knitted and visible in the foreground causes the other colour to hang as a yarn line in the background (Figure 14). As a result, significant distances between the appearance of one colour in the front result in longer unknitted yarns in the back, posing challenges such as tangling or snagging with toes or fingers during wear in the case of a knitted stocking. Therefore, while some Anatolian motifs may seem arbitrary, there is, in fact, a strong correlation between the invented visual patterns and the physical limitations of multicolour knitted surface construction.

Figure 14. A photograph of the patterned pair of stockings inside out, showing the free-floating lines of yarn
Source: photo by the author

Within these physical structural constraints, women in Anatolia have developed a shared system of inscription in which motifs are the smallest units. Although motifs and their meanings may vary across the larger geography, they are shared in regional contexts. The system functions as a language because its units can be decoded and reproduced by others in the community. This capability owes to the aforementioned special ability of textiles to store information about how they were made. When knitters hold a knitted object in their hands, they can trace back the threads and reverse engineer a knitted motif into a mental "formula," a "knitting pattern." Using this abstract information, a motif can be reconstructed back into its physical knitted form, making it possible for motifs to be preserved across time and space. Knitting motifs, thus, exist both universally "in the cloud," so to speak, as patterns, and can be reproduced endlessly locally as physical objects, making knitting an extraordinary medium for the creation of a shared language of inscription.

6. Knitted stockings as tacit media

The way Anatolian stockings functioned as media in the local communities is different from the other examples of strictly secretive, steganographic and covert practices that are provided above, such as Madame Defarge's registry knitting and the spy techniques of Phyllis Latour. Besides being widespread cultural products, the stockings served as a "tacit" medium for communication, where feelings, thoughts and desires were expressed without being spoken directly or openly. From our contemporary perspectives, Anatolian women's messages about love, pregnancy, consent and dissent expressed in this medium may not immediately seem significant. However, a closer examination of the lives of the women before and around the mid-20th century reveals the urgency of their use of knitting as a subtle tacit medium of expression and the critical role that ordinary stockings may have played in shaping these individuals' lives.

Values and customs may vary. However, it is widely understood that marriage held immense significance in the lives of rural village women in Anatolia. Preparation for marriage often began with the practice of preparing a dowry for a bride-to-be, beginning as early as infancy or toddlerhood. While the contents of dowries may also vary, they typically consist of a collection of purchased and handmade items to be used in the early domestic life of the newlyweds or given as gifts to the groom and families. Handmade dowry items may include hand-knotted pile rugs, hand-woven kilims, embroidered tablecloths, bedspreads, curtains, towels, decorated shawls and knitted stockings, among other textile items.

In the conventional patriarchal system that has long existed in Anatolia, many women were considered commodities to the extent that their marriage to another family required a payment, known as başlık

(headpiece), to the woman's family. Thus, there were other parameters of economic and power gain at play when deciding to whom a young woman would be married, which was not always the one of her own choice. With marriage, entering a new family at a young age with the responsibilities of bearing children and managing the household, women's lives gain new hardships. Her spouse, personally chosen or not, becomes the one who will determine her future. The young woman's transition into the new family is thus a critical journey, as illustrated by the lyrics of the following well-known song, which is typically sung by a female crowd during the all-female henna night (*kına gecesi*) before the wedding.

Yüksek yüksek tepelere ev kurmasınlar
Aşrı aşrı memlekete kız vermesinler
Annesinin bir tanesini hor görmesinler
Uçan da kuşlara malum olsun
Ben annemi özledim
Hem annemi hem babamı
Ben köyümü özledim

Don't let them build houses on high hills
Don't let them give away girls (brides) to faraway lands
Don't let them despise her mother's precious
Let the flying birds notice that
I missed my mother
Both my mother and my father
I missed my village

Based on local traditions, one or a few days after this event, the bride is ceremonially given to her new family. This ritual may involve the groom's family going to the bride's house in the morning, picking her up, putting her on a donkey or horse and taking her to the groom's house. The dowry, typically a wooden chest full of handmade goods, is often transported with the bride to her new family's home during this event.

Throughout a woman's life, divided into two phases by the event of marriage, knitted stockings emerged as a medium of expression at various junctures. Stockings were secretly given to desired suitors, exchanged during engagements, offered as wedding gifts and included in dowries. After marriage, women continued to use stockings to communicate with spouses serving in the military and to share intimate matters while living with and working for in-laws. They also sent stockings to their own family members, signaling their circumstances in their new lives. Thus, knitted symbols played an important role in giving young women agency to "write" about unspeakable matters. The prevalence of illiteracy among women was very high at the time, recorded at 90 % in 1935 and 80 % in 1950 census data (Gelişli 2014). Therefore, knitting, along with the practices of weaving, embroidery and lace-making, was one of the few rare means of expression and inscription for most rural women.

Anatolian knitted stockings were not secret documents, as the meanings behind the motifs were known to some extent to everyone in the community. What is critical is that the translation of messages into knitted visual symbols appears to have allowed content that was normally repressed and inexpressible verbally to freely circulate. This likely became possible because the messages embedded in ordinary stockings in the form of visual, decorative symbols – crafted through women's work – could transcend the typical binary paradigms of direct communication: legible versus cryptic, told versus untold, sent versus unsent, read versus unread. Messages in the form of knitted motifs can be considered sent and unsent, read and unread at the same time. One could pay attention to these messages while seemingly ignoring them, even allowing the oppressive party to bend the rules without seeming to lose power. Thus, this tacit form of expression was an ingenious form of subtle resistance that, when the circumstances allowed, enabled women to navigate the strict social rules set by previous generations.

Conclusion

The aim of this paper was to provide an exploratory introduction to knitted Anatolian stockings as techno-aesthetic and tacit media. The historical development of knitting motifs as a symbolic language in Anatolia suggests women's need for expression at a time when verbal communication of such thoughts and feelings was limited and serves as evidence of the deep-rooted oppression of Anatolian women.

My personal interest in exploring this medium began as an artist's curiosity, stemming from my first-hand familiarity with the techniques and culture of the region. In my initial survey, I realized that knitting motifs from Anatolia were not only absent from mainstream media studies contexts but also from specific interdisciplinary work focused specifically on textiles and their connections to data practices. In sharing this initial phase of my research, my primary goal is to draw attention to this understudied cultural product that has been captured in ethnographic studies of the region but may have further potential to interest perspectives outside of the geographical region, from various fields, particularly those related to media thinking.

Modes of textile thinking that can be found in local, minor, marginalized practices have the potential to reveal multiple archetypal relationships between textiles and modern computational thinking, beyond the historical influence of the Jacquard loom on the invention of the first analogue computer. In attempting to understand how knitted Anatolian stockings provided a medium for data inscription, as well as the larger context of textile-based inscription techniques, I have begun to develop a new entry point that situates data inscription as a unique affordance of fiber manipulation at a more fundamental level. In my own work, I hope to develop this particular perspective into a deeper understanding of textiles as inscriptional hardware, both through research and artistic practice. This focus could be useful for future work to rethink the historiographies of modern media and shed more light on why textile manufacturing techniques were an important contributor to the path leading to the invention of computational technologies.

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References

Barber, Elizabeth J.W. *Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages with Special Reference to the Aegean*. Princeton, NJ: Princeton University Press, 1992.

Barber, Elizabeth J. W. *Women's Work: The First 20,000 Years; Women, Cloth, and Society in Early Times*. New York, NY and London: W.W. Norton & Company, 1995. DOI: https://doi.org/10.1515/9780691201412

Barışta, H. Örcün. "*Türk El Sanatlarından El Örgüsü Çoraplar*" [Hand-Knitted Socks from Turkish Handicrafts]. *Erdem*, vol. 2, no. 6, (1986, September): 867-882. https://dergipark.org.tr/tr/pub/erdem/issue/44564/552992.

Barışta, H. Örcün. T*urkish Handicrafts*. Ankara: Ministry of Culture and Tourism, 1988.

Dickens, Charles and Richard Maxwell. *A Tale of Two Cities*. London: Penguin Classics, 2011.

Gelişli, Yücel. "*Türkiye'de Kadın Eğitiminin Bugünkü Durumu*" [The Current State of Women's Education in Turkey]. *Akademik Bakış International Journal for Social Sciences*, no. 40, (2014). https://dergipark.org.tr/tr/download/article-file/382702

Gibson, James J. *The Ecological Approach to Visual Perception*. New York: Taylor & Francis, 1986.

Gleba, Margarita. *Textile Production in Pre-Roman Italy*. Oxford, UK: Oxbow Books, 2022.

Gleba, Margarita and Ulla Mannering (eds.). *Textiles and Textile Production in Europe from Prehistory to AD 400. Ancient Textiles Series 11*. Oxford, UK: Oxbow Books, 2019.

Grömer, Karina, Regina Hofmann-de Keijzer and Helga Rösel-Mautendorfer. *The Art of Prehistoric Textile Making: The Development of Craft Traditions and Clothing in Central Europe*. Edited by Andreas Koch. Translated by Katharina Rebay-Salisbury and Roderick B. Salisbury. Vienna: Natural History Museum Vienna, 2016. DOI: https://doi.org/10.26530/OAPEN_604250

Harlizius-Klück, Ellen. "Weaving as Binary Art and the Algebra of Patterns". *TEXTILE*, vol. 15, no. 2, (2017): 176-197. DOI: https://doi.org/10.1080/14759756.2017.1298239

Haring, Kristen. "How to Knit a Popular History of Media". Video recording of the lecture presented in *The History and Theory of New Media Lecture Series* (2011, 13 October). Retrieved from http://opentranscripts.org/transcript/knit-popular-history-media/

Harrell, Betsy. *Anatolian Knitting Designs: Sivas Stocking Patterns*. Istanbul: Redhouse Press, 1981.

Kittler, Friedrich A. "There Is No Software." *The Truth of the Technological World: Essays on the Genealogy of Presence*. (Redwood City: Stanford University Press, 2014), 219-229. DOI: https://doi.org/10.1515/9780804792622-016

Kuchera, Susan. "The Weavers and Their Information Webs: Steganography in the Textile Arts". *Ada: A Journal of Gender, New Media, and Technology*, no. 13, (2018, May). DOI: https://doi.org/10.5399/uo/ada.2018.13.9

McCarty, Cara. *Tools: Extending Our Reach*. New York, NY: Cooper Hewitt Museum, 2014.

Nas, Emine. "*Türk Çeyiz Geleneğinde Milli Söz Hazinesi*" [The National Capital Treasury Developing as a Language of Communication in the Landscape of the Turkish Dowry Culture]. *Journal of Turkish Studies*, vol. 13, no. 18, (2018): 991-1005. DOI: https://doi.org/10.7827/TurkishStudies.12725

Özbel, Kenan. *Knitted Stockings from Turkish Villages*. Ankara: Türkiye İş Bankası Kültür Yayınları, 1981.

Özbel, Kenan. *Türk Köylü Çorapları* [Turkish Villager Stockings]. Ankara: Türkiye İş Bankası Cultural Publications, 1976.

Özbel, Kenan. *El Sanatları I: Anadolu Çorapları* [Handicrafts I: Anatolian Stockings]. Kılavuz Kitaplar: IX, Ankara: C.H.P. Halkevleri Bürosu, 1945.

Parikka, Jussi. *What Is Media Archaeology?* Cambridge, UK; Malden, MA: Polity Press, 2012.

Salomon, Frank. *The Cord Keepers: Khipus and Cultural Life in a Peruvian Village*. Durham: Duke University Press, 2004. DOI: https://doi.org/10.2307/j.ctv11hpp2t

Schneider, Birgit. *Textiles Prozessieren: eine Mediengeschichte der Lochkartenweberei*. Zürich and Berlin: Diaphanes, 2007.

Turney, Joanne. *The Culture of Knitting*. Oxford, UK: Berg, 2009.

CV

Ebru Kurbak
University of Applied Arts Vienna
ebru.kurbak@uni-ak.ac.at

Ebru Kurbak is an artist and researcher born in Izmir, Turkey, and based in Vienna, Austria. Her practice explores the entanglements between art, technology, culture, and politics, with a focus on uncovering hidden values and ideologies in science and technology research. Ebru is currently a senior research fellow at the University of Applied Arts Vienna and runs the arts-based research project titled The Museum of Lost Technology (2020-2024) funded by the Austrian Science Fund (FWF) [10.55776/V795]. She previously was PI of the arts-based research project titled Stitching Worlds (2014-2018) and a visiting professor at the University of Applied Arts Vienna (2020–2022). She also taught at the Departments of Visual Communication Design and Photography and Video at the Istanbul Bilgi University (2003-2006) and the Department of Space and Design Strategies at the University of Art and Design Linz (2006-2014). Ebru carried out artistic residencies at La Gaîté Lyrique (FR), V2_Institute for Unstable Media (NL), LABoral Cultural Center (SP), and EYEBEAM (US), and has exhibited at international platforms including the MAK – Museum of Applied Arts Vienna (AT), Ars Electronica Festival (AT), ZKM (DE), SIGGRAPH Conferences (US), Microwave Festival (Hong Kong), Istanbul Design Biennial (TR) and Piksel Festival (NO), among others. Ebru was awarded the LACMA Art + Technology Grant by the Los Angeles County Museum of Arts in 2019. Her work entitled *Reinventing the Spindle* received the Art Gallery Best in Show Award at Siggraph 2023. https://ebrukurbak.net/