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# Finding Binding Points: Design Development and the Digital World

Wendy Weiss

University of Nebraska-Lincoln, [wweiss@unlnotes.unl.edu](mailto:wweiss@unlnotes.unl.edu)

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## Finding Binding Points: Design Development and the Digital World

Wendy Weiss

The natural environment as a visual and spatial form has inspired my work, often expressed in a political context.

Since I started weaving in 1976 as a college student, my eagerness to work with fabric structures via the loom as a tool has not diminished, except for a short period in graduate school when I put my attention toward making simple, open work crochet and huge piles of netted planes and sculpture, based on the research of Raoul d'Harcourt, that I found in his book *Textiles of Ancient Peru and their Techniques*.

What I learned from these experiments and understood in the year immediately following graduate school, in 1984, was that I wanted to make spaces in which people moved. I wanted to capture the attention of the viewer through the body. In my undergraduate art history and aesthetic classes, I learned about painting as the superior art form, as the eye beholds the artwork at a distance, removed from the messiness of the body. The intellect considered what information the eyes gathered. This was not what I wanted. I felt the way to the mind was through the body, with no single sense leading the way, but rather the combined sensory experience provoked the mind to struggle with the feelings and sensations the artwork evoked.

At that time, I couldn't find any literature to support this idea. Now lectures, papers, and books explore the relationship of sensing and knowing. Most recently I read an essay in the August 31, 2014 Sunday NY Times by Richard Kearney titled, "Loosing our touch," partly about a hierarchy of the senses, with Aristotle contesting Plato's ideal of the gaze. Aristotle lost this argument some 2000 years ago. This author laments the touch pad as a proxy for proximity and argues, "We need to find our way in a tactile world again."<sup>1</sup>

Ann Hamilton, who is speaking at this conference on Saturday morning, in an interview with Krista Tippett's "On Being" program said, "that we grow up or we're educated in a world that ascribes a lot of value to those things that we can say or name. And, but they're all these hundreds of ways that we know things, through our skin, which is the largest organ of our body. And, so, you know, my firsthand is that textile hand, and text and textiles are woven always, experientially for me."<sup>2</sup>

<sup>1</sup> [http://opinionator.blogs.nytimes.com/2014/08/30/losing-our-touch/?\\_php=true&\\_type=blogs&\\_r=0#more-154019](http://opinionator.blogs.nytimes.com/2014/08/30/losing-our-touch/?_php=true&_type=blogs&_r=0#more-154019)

<sup>2</sup> <http://www.onbeing.org/program/ann-hamilton-making-and-the-spaces-we-share/transcript/6148>



*Figure 1. Tree Spiral. 1992. Linen, wool, cotton, rayon. Woven after hand painting warp with fiber reactive dye. Mounted on encaustic on wood. 90" x 60" x 2". Used with permission. Image by Roger Bruhn.*

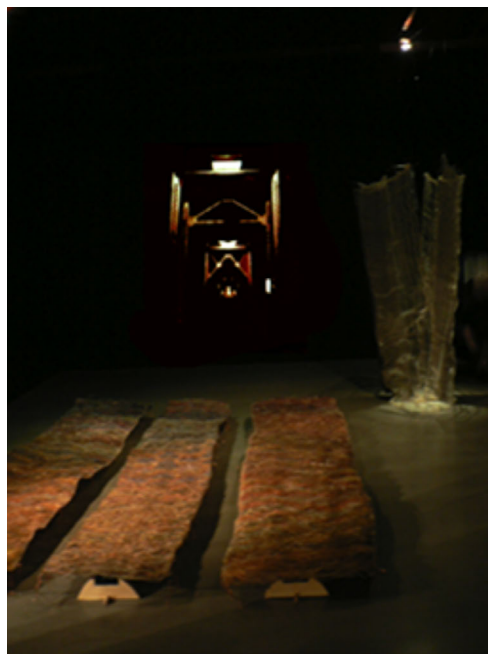
The hand and digital process create a dialog, which has become an essential part of my creative work. In contrast to my inspiring colleagues on this panel, I have executed my woven textiles exclusively on a 20-shaft electronic dobby loom, which I converted from a conventional jack loom about 20 years ago. Various considerations led me to this decision: accessibility, relevance to my teaching program, and my dedication to building the Robert Hillestad Textiles Gallery at the University of Nebraska. At the time, the very different approach to designing that Jacquard weaving requires, was a factor as well. I was still investigating complex weave structures on a limited number of shafts. I had more to learn and discover.

The conversion to the electronic dobby made a big difference in the way I worked because I no longer wanted to put long, undyed warp threads on my loom and paint and screen print with wet processes, as I feared damaging the electronics.



*Figure 2. Ephemeral Forest, 2000-02. Wendy Weiss and Jay Kreimer. Handwoven fabric, handmade paper, and wood sculpture, sound installation. Dimensions variable, from 20' x 20' to 50' x 50'.  
Image by Nina Szczerbowska. Used with permission.*

I began designing multi-layered and shaped weavings that unfolded dimensionally into space, manipulated corduroy weave structures to create long, loom controlled weft floats, periodically inserting copper wire to give the fabric form, and others that had simple bound resist designs. In 2002, research at the Winterthur Library in Delaware in the manuscripts department allowed me to spend every day for a month poring over manufacturer's sample books and weaving books, analyzing weave drafts for future weavings.



*Figure 3. Traveler's Field, 2004. Textile and sound environment. Wendy Weiss and Jay Kreimer. Courtesy photo.*

As my desire to work with Ikat grew, along with a wish to develop more complex designs ten years ago, I began looking at the literature written about warp resist binding processes and found only a handful of published texts from around the world, some of them hard to find and expensive books.



*Figure 4. Cargo Cloth #2. 2005. Detail. Cotton and nylon with warp ikat. Natural and synthetic dyes. 129" x 40".  
Courtesy photo.*

In 1996 Lydia Van Gelder updated and republished her 1980 book **Ikat**, in which she includes valuable historic information, photographs, diagrams, equipment plans, and project descriptions. She details the process from several different geographically located groups. This book is the most comprehensive one that I have seen for artists who want to make intricate ikat fabric in their studio and I used that information in my own work. Another valuable book that describes the ikat method with illustrations and photographs is **Japanese Ikat Weaving: the Techniques of Kasuri**, by Jun and Noriko Tomita. Alfred Buhler and Eberhard Fischer, in **The Patola of Gujarat: Double Ikat in India**, a two volume illustrated text with photographs, drawings, and narrative, describe the entire process with the notable exception of a detailed description of the key step of interlacing the warp. This step is the most complicated and important feature of the Gujarati method and historically was carefully guarded.



*Figure 5. Master Weaver Vaghela Vitthalbhai systematically groups silk threads in bundles for binding. Courtesy photo.*





*Figure 6. Rapid hand movements makes still photography an incomplete record the work of a master craftsman. Vitthalbha attached the prepared warp to a smooth wooden pole after he grouped all the warp yarns. Courtesy photo.*

I found it difficult to understand the exact processes the texts and images provided. Consequently, I decided my best course of action was to find a master weaver to study with and document the process with observation and digital tools. I used a “flip” digital video camera and a Lumix digital still camera with video option and took copious notes by hand.

A master weaver at work is in a state of exchange with the material, the design, the craft and the process. Words and photographs alone cannot capture the action. Digital video can bridge that gap.



*Figure 7. Master Weaver Vaghela Vitthalbhai makes a thread reed and shedding mechanism for this weaving directly around the dyed warp. Courtesy photo.*

In 2009 I worked with Master Weaver Vaghela Vitthalbhai in the Surendranagar district of Gujarat, with the support of a Fulbright Nehru Senior Scholar Award. Mr. Vitthalbhai invited me to design a weaving that he executed and I documented him at work as he prepared the warp for bound resist dyeing.

These videos are a fragment of what I captured on film, along with still photographs and handwritten notes. As Mr. Vitthalbhai did not speak English with me, it was essential that I understood the process as he went. Occasionally I would stop and ask him to repeat a step or slow down. When I returned to Nebraska I organized all the still photographs and the most relevant of the videos into a presentation to help me reconstruct the complex method of preparing the warp for bound resist or ikat design as practiced in Gujarat, India.



*Figure 8. Initial binding in Nebraska on cotton and wool warp, interlaced together, based on documentation of Gujarati warp ikat method. Courtesy photo.*

In my studio I tested out my understanding of what I learned and prepared a bound resist set of three warps with text to check my accuracy and to explore ideas of how to use this traditional method. I relied heavily on my video documents to reconstruct the process. Because ikat is taught in an apprentice style, very little documentary record that I am aware of, is available to Indian artisans. I have given all my documentation to Mr. Vitthalbhai, who has a computer and I will return to work with him this October and share what I have discovered using digital tools to develop new designs. Ironically perhaps, I have

also published a text and photo based article on the process in the Journal of Textile Design Research and Practice, outlining the warp resist process step by step.

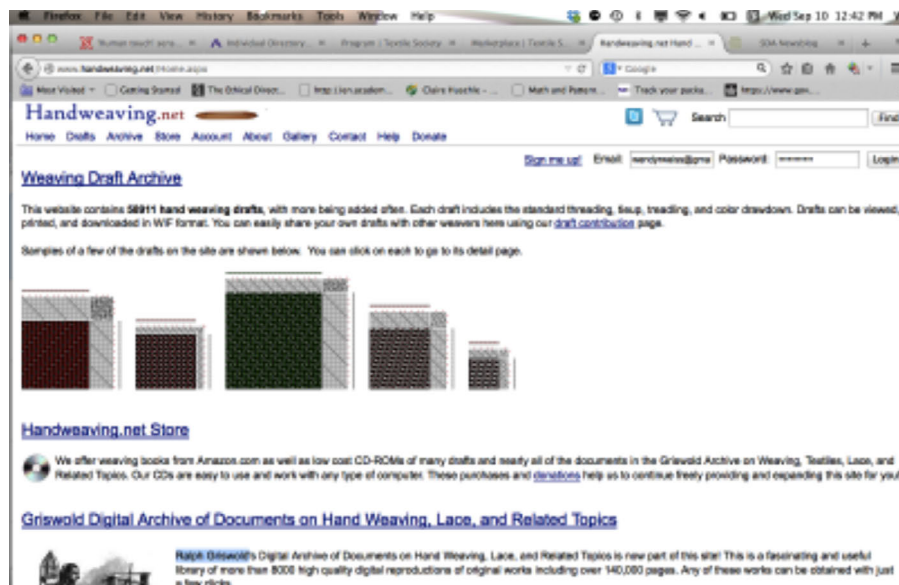
One of the biggest impacts the research and documentation of this method of warping has offered me is a new way of looking at how to use warp resist binding to develop repeating pattern, in combination with using the raddle group for the preliminary grouping of warp threads. The Indian method uses a system of interlacing multiple sets of warp groups so that the weaver can dye bundles of threads in identical patterns. This system then allows the weaver to set the groups of warp on the loom consecutively for a repeating pattern in a single cloth. I used this idea to make multiple warps to weave up the design as an “edition”. This possibility is compounded with the option of folding the warp along the length to form symmetrical designs.



*Figure 9. Detail. Blood on my Hands. 2010. Madder root and cosmos flowers dye on wool and nylon. Image by Bob Meier. Used with permission*

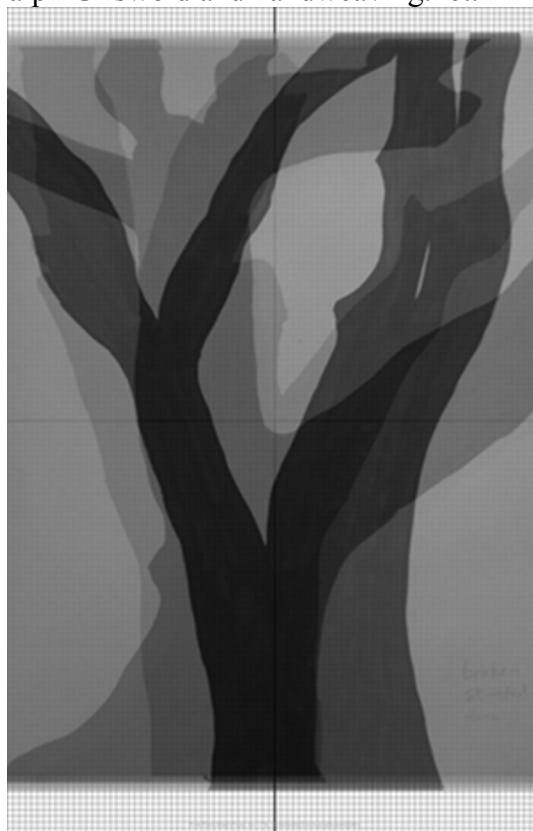


Complex weave patterns published centuries ago are housed in rare book and manuscript libraries. The weave structure for this weaving and others are from on-site research studying historic manuscripts and sample books at Winterthur in 2002.



*Figure 10. Draft Collection. Screen shot from Handweaving.net, a valuable resource for handweavers.*

Now digital archives make many hard to find texts widely available to those with Internet access, notably through the efforts of Ralph Griswold and handweaving.net.



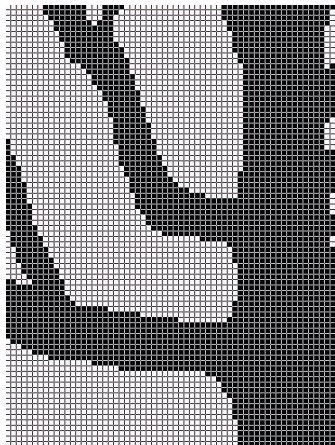
*Figure 11. Hand drawings manipulated in Photoshop as preliminary ideas for ikat designs. 2011. Courtesy photo.*

Some people, like Janice Lessman-Moss, are wizards in Photoshop. I found it to be cumbersome for simplifying the black and white drawings I was using for imagery in ikat, but used Photoshop to create my sketches for binding the first set of work I made for an installation with Jay Kreimer called *Against the Sky*, exhibited at the Museum of Nebraska Art in Kearney, Nebraska.



*Figure 12. Against the Sky. 2012. Installation view of weavings and wood sculpture in collaboration with Jay Kreimer  
Nebraska Now: Museum of Nebraska Art. Kearney, NE. January 14-April 8, 2012  
<http://monet.unk.edu/mona/exhibit/510.html>*

I discovered as I began working with Pro Weave, a cross platform weave software package—one that I could use on the Windows based computers for teaching as well as my Macintosh system on my studio loom—that I could more easily convert and scale drawings in a grid based format suitable for ikat design work.



*Figure 13. Pro Weave, a weave structure software, allows working with images. It is easy to convert the scale of drawings and superimpose them onto a grid.*

In addition, designs can easily be manipulated using the various forms of symmetry that are typical in the Gujarati style of warp preparation.



*Figure 14. On the left, the warp is stretched and bound, on the right is the mock-up of the weaving in Pro Weave.*

In preparation for teaching two week workshop at the Strzemiński Academy of Fine Arts in Łódź, Poland in August 2014, I further experimented with using the raddle cross group threads and create repeating pattern across the warp. Digital tools, particularly weave structure design tools, allow the designer to graphically render the repeating pattern prior to committing to a particular binding pattern.



*Figures 15. A sample cotton ikat warp, dyed with Brazilwood. 2014. Courtesy photos.*



*Figure 16. Dominika Zietek removes the binding from her warp dyed with marigold flowers.*

The ease of electronically researching obscure details of textile properties and history has enabled me to explore materials in ways that address their tactile and expressive potential. In 2012 a growing concern about the over abundance of polyester clothing led me to research recycled fabric as a material in an installation in Lincoln, NE.



*Figure 17. Everyday Interests of Young People. Core, 2012. Double weave designed from a selection of patterns culled from historic references downloaded from [handweaving.net](http://handweaving.net). Courtesy photo.*



For this collaboration with Jay Kreimer, I acquired bags of used black polyester pants from a nearby thrift store on “bag-day” for one dollar per bag and “free-day” when all product remaining for that season is free to be removed before the store restocks with more donated merchandise.



**Figure 18.** *Everyday Interests of Young People. Drawing with Pants. 2012. Installation with Jay Kreimer. Courtesy photo.*



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PREFACE.

Writing a mere description of Jute Machinery will not be of much assistance to the student since there is so much detail, and that detail it is of importance to know well before you can expect to get the many wheels and pinions, &c., in your “mind’s eye,” hence the reason that considerable attention has been bestowed on the illustration of all the parts of the machines. These illustrations being all made to scale, very readily bring before the reader the different proportions and relations of one wheel or roller to another.

Every effort has been made to avoid errors in the calculations. There may be some, however, in the book, but, generally speaking, the figures can be relied upon.

My sincere thanks are due to A. S. Macpherson, Esq., of Messrs Fairbairn, Naylor, Macpherson, & Co., Limited, Leeds; and also to A. Gordon Thomson, Esq., of Messrs Thomson, Son, & Co., Dundee for valuable assistance rendered.

WILLIAM LEGGATT.

DUNDEE, May, 1893.

**Figure 19 and 20.** *The Golden Fiber. Installation of bamboo, inspired by research on jute manufacture at the Dolphin Jute Mill in Patterson, NJ and text from the preface of Jute Spinning, by William Leggett, published in 1893 and downloaded as a PDF on July 14, 2013*

In Patterson, NJ, an exhibition at the Art Factory provided an opportunity to research jute fiber and use discarded bamboo as a stand in for jute. Jute fiber thrives in Bangladesh and India and factories in Patterson, NJ processed it until the 1950’s when the synthetic fiber market began to dominate the traditional jute trade. On-line research allows rapid access to historical and contemporary records documenting the jute industry.

Technology has become a tool for me to both to research ideas and to facilitate the design and weave process. Rather than replacing the tactile object, it facilitates exploration and prototyping.