

Interwoven lines: a practice-based investigation of Tim Ingold's meshwork

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Abstract

Anthropologist Tim Ingold argues that the world is shaped by interconnected processes. He argues that, because all materials are constantly changing due to their interactions with various forces, everything is on a trajectory that can be conceived of as a line. These 'lines' interweave and form a 'meshwork', described by Ingold as an 'ever-evolving weave' (Ingold 2011, 71). In this research, I investigate how lines interweave in practice and what impact this has on the structure of what is woven. Through a series of practice-based experiments, I focus on the behaviour of yarns, tools, and weave structures to reveal how material engagement enhances and refines our understanding of Ingold's theoretical proposition.

I have identified three key factors as central to the meshwork: the properties of individual lines, their interactions, and the external forces influencing their behaviour. Through practice-based research, I examine Ingold's theoretical concept of an ever-evolving weave in order to ascertain whether or how such an 'ever evolving weave' might be possible in a reality comprised of actual threads. This doctoral research demonstrates the veracity of Anni Albers' assertion that observable processes of weaving can generate insights relevant to other fields.

In terms of weaving practice, the outcome of my research project is that we understand weaving beyond its material product and instead as a continuous and evolving process. The woven form is the result of ongoing interactions between lines, influenced by the material properties and the processes they undergo. What is woven can be understood as a byproduct of the behaviour of lines, shaped by their histories, continual interplay, and therefore can be considered dynamic.

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Introduction

My research explores anthropologist Tim Ingold's meshwork through a practice-based investigation of the behaviour of lines in weaving. 'Meshwork' is a concept coined by Ingold to refer to a world shaped by interconnected processes. Ingold argues that the world that we inhabit should be understood as a meshwork, and that the meshwork is composed of interwoven lines (Ingold 2011, 63). This proposition appears counterintuitive, as our everyday perception tends to frame the world in terms of distinct forms and surfaces rather than continuous lines.

To state that something is created through the interweaving of lines does not fully explain the complexity of the process. There is much more involved. My research engages directly with Ingold's theory through the practice of weaving, investigating how lines of yarn behave, the conditions that influence these behaviours, and how such interactions shape what is produced within this material context. The first aim of my research is to enhance and refine understanding of Ingold's theoretical proposition through practical investigations.

The meshwork is created through the dynamic interaction of lines; consequently, what is woven is itself dynamic. The second aim of my research is to generate fresh insights into how weaving can be used and understood in the field of fine art. By examining Ingold's presentation of lines alongside direct observations of the behaviour of lines in my woven samples and larger artworks, I identify what he considers significant in the interweaving of lines and how this reflects his broader understanding of the world. This allows me to explore how woven artworks might be viewed differently: not merely as static objects, but as expressions of the ongoing, collective behaviour of lines.

To achieve these aims, this study begins by investigating Ingold's presentation of lines and meshwork. It then draws on and builds from artist Anni Albers' theorisation of weaving and her assertion that knowledge of 'textile fundamentals and methods' (Albers et al. 2017, ix) can be relevant in other fields. My research is shown to sit alongside the work of other artists who use weaving in fine art to explore concepts beyond the creation of fabric.

Ingold's meshwork is thought to grow in response to the interaction of lines. What is created is therefore partly determined by the agency of the lines. This concept is applied to how lines of yarn in weaving can be seen to have agency. From this exploration, two key questions are identified. To answer these questions, I use as a framework, performer and researcher Robin Nelson's 'practice as research' methodology.

Ingold, lines and meshwork

Fundamental to my research is an understanding of Ingold's concept of meshwork, which is idiosyncratic and particular to his theoretical outlook. To understand his meshwork, it is necessary first to examine the concept of lines, because his meshwork is composed of lines. I will therefore begin with an introduction to Ingold's conceptions of lines and meshwork. I will focus on explaining how Ingold uses the term 'line.' This explanation will then lead to a broader discussion of his meshwork concept.

Line

Ingold describes himself as a 'linealogist: a student of lines' (Ingold 2015, 53). He states that lines 'are phenomena in themselves. They are really there, in us and around us' (Ingold 2016, xv). Ingold justifies his argument that lines exist by illustrating where they can be found. His examples include a snail trail, lines made by a bird in the sky and roots on the ground (Ingold 2015). It is easy to agree that lines, such as a tree root, exist as they can be seen and touched. However, for Ingold, being able to see and touch are not the criteria to assess the existence of a line. Lines, he argues, can also be created through gestures, which can be understood as movements in space. Whilst the action of the body may be visible, the line itself is not (Ingold 2010b). Central to Ingold's presentation of lines is the idea that the world is composed of materials, all of which are constantly changing due to their interactions with various forces. Change implies movement, and movement is inherently dynamic. For this reason, Ingold defines everything in the world as being on a trajectory, which he conceives of as a line.

Ingold likens the formation of lines to the practice of wayfaring (Ingold 2011). A wayfarer moves in their environment in response to what they encounter. Each movement proceeds and is preceded by another. Even when it may appear that the wayfarer has stopped, the pause is part of the ongoing movement, leading to the next action. Ingold likened it to a knot in a thread. Just as the thread loops up and around, passing through itself to create the knot, the wayfarer's path extends beyond any single location, reflecting life's constant state of evolution (Ingold 2011, 149).

Since Ingold uses wayfaring to explain his understanding of lines, it could suggest that only living entities can be thought of as creating lines. However, Ingold asserts that even inert objects, such as a stone, can be considered as undergoing change (Ingold 2011, 16). He argues that the world consists of material, and it is the interaction between forces and material, exemplified by processes like erosion, that can be seen as a form of change, which he interprets as movement. To better understand this transformation, he asserts that we should think of the materials as changing or moving along lines. A line can extend

indefinitely, just as the world is perpetually shaped by the interaction of materials and forces. The material is in a constant state of flux. The world, much like the line, is ever-evolving and unceasing in its activity. For Ingold, this continuous change, even in subtle ways, is a 'becoming' which creates a line (Ingold 2011, 142). Like the earlier cited gesture, it exists but cannot be seen or understood as clearly as a drawn line or a line of thread.

Ingold contends that music and stories follow lines. They are not collections of words or notes but a merging of things. They relate to what has come before and what is to come. Rather than numerous isolated points, the fact that they make a connection means that the points effectively join up. It could be argued that sounds and words can be viewed as isolated incidents that do not connect to other words and sounds. However, according to Ingold's argument, they emerge from actions and events, such as bodily movements that produce speech or the interaction of surfaces that generate sound and thus become part of a continuum that he describes as a line.

Ingold argues against a view of the world as a surface on which objects rest (Ingold 2015, 38). He asserts that this understanding presents things as containers, bounded shapes with an inside and an outside. This implies that certain parts of the world (that which is inside) are separate and isolated. They are not exposed to the fluxes and flows of materials and forces. Depicting something as a line means that the shape has effectively been opened up. All parts are affected by the materials and forces that surround them, so it is not static but constantly changing. Ingold asserts that in his presentation of lines, he is seeking to undo what he calls 'the operation of inversion' in which lines have become bounded shapes and thus abandon 'the fixities of genes, images, recordings and landscapes for the generative movements, respectively, of life, light, sound and weather' (Ingold 2011, 97). Ingold, in essence, is advocating for a process-oriented perception of the world.

Meshwork

Ingold wants the world to be thought of as an 'environment without objects,' an EWO. He explains that the EWO is 'a world that is, so to speak, continually on the boil' (Ingold 2010a, 8). Rather than seeing the world as a static collection of pre-existing objects, Ingold portrays it as a dynamic, ever-evolving process of becoming. This process is, as described earlier, conceived of as a line. Lines do not grow in isolation but are shaped by and reliant on the continuous activity of other lines. The lines are codependent; the world is therefore perceived as multiple interdependent processes of growth and movement. Ingold describes the lines' interplay as forming a meshwork. Like the lines from which it is composed, it is also in a constant state of growth and movement.

Ingold uses the term meshwork to distinguish his concept from Bruno Latour's actor-network theory (Ingold 2011, 64). Actor-network theory (ANT) proposes that everything in the world exists through interconnected relationships, where nothing functions in isolation. Within this system, there is no fixed hierarchy; instead, all entities interact and influence one another in shifting and dynamic ways. This perspective highlights that humans are not separate from or dominant over the world around them but are instead part of a wider network in which all things, both human and non-human, play an active role (Latour 2005).

This understanding resonates strongly with Ingold's concept of meshwork, and Ingold acknowledges the merit of Latour's original *acteur réseau* theory. However, he argues that its translation into 'actor-network' in English has led to an understanding that resonates with systems of transport and communication. Ingold states that this translation gave the term a significance that Latour 'never intended' (Ingold 2011, 85). He points out that the French word *réseau* refers to netting, network and, therefore, woven fabric, lace and webs. While the meaning itself is not vastly different from his use of meshwork, Ingold seeks to address the evolved interpretation of network. He describes both meshwork and network as 'images' and wants to replace one with the other (Ingold 2007, 35). By replacing the image of network with that of meshwork, Ingold is altering the image and the subsequent set of thoughts which stem from it being understood as a network.

According to Ingold, the commonly accepted understanding of a network focuses on the connections between elements and how each element relates to another. Whilst this understanding may appear in sympathy with Ingold's concerns, he asserts that it inherently requires elements to be defined in isolation before their connections can be identified. This process isolates the elements, treats them as distinct entities first and only later considers their relationships (Ingold 2011, 70). For Ingold, entities exist because of their relationships and cannot be separated from them. In this context, he uses the term 'relationships' to emphasise the interconnected nature of all things, highlighting how their connections influence their behaviour, subsequent interactions, and ultimately, their ability to persist. In essence, Ingold is arguing that viewing the world as a meshwork allows for a deeper understanding of how all components are inseparably linked through the dynamic interplay of materials and forces within their environment. In this inextricable linking, everything – entities, life, material – is constantly changing.

To illustrate what he sees as the difference between network and meshwork thinking he has created two drawings shown in figure 1.

Tim Ingold, *The meshwork of entangled lines (above) and the network of connected points (below)*, 2007. Illustration. In *Lines: A Brief History* (London: Routledge), 82

Figure 1 Ingold's drawings of a meshwork and network (Ingold 2007, 82).

In the image at the bottom, the points indicated by the letters are connected by the lines. In the image at the top, there are no points, only lines. There is no stopping, but a continuous linear flow. Conceiving of the world as a network involves focusing on specific points or bounded entities. Conceiving of the world as a meshwork shifts the focus onto the dynamic and fluid nature of materials. Consequently, all things are caught up in different stages of movement, also understood as a form of growth, which in this context is conceived of as a line. Meshwork thinking focuses on understanding the world and everything in it as being in a constant state of evolution. One thing's evolution is impacted by and impacts upon other things. Things can be understood as a line or a 'bundle of lines' (Ingold 2017b, 10). These lines are all interwoven, forming the meshwork.

A distinct meshwork

Ingold cannot simply adopt an established definition of meshwork, as there are differences in understanding. In textile classifications by anthropologist Annemarie Seiler-Baldinger (Seiler-Baldinger 1992) and anthropologist Irene Emery (Emery 2009), a 'mesh' is often described as a 'net'; both are used to refer to open fabrics. Differences do, however, arise in how they define a mesh. For Seiler-Baldinger, a mesh is created from one continuous thread, such as in knitting or crochet. Emery is less specific. She suggests that meshes can be created from multiple elements. The way that Ingold uses the term meshwork is specific to his theoretical frame; he refers to it as a key concept, and he defines it 'as a texture of interwoven threads' (Ingold 2011, xii). He further describes it as an 'ever-evolving weave' (Ingold 2011 71). While Emery and Seiler-Baldinger have different definitions of the term 'meshwork' and how one can be constructed, Ingold's meshwork is woven.

As 'things' in the world composed of material, we are part of the meshwork. We cannot observe it from afar. The meshwork is a concept. The onus is on Ingold to explain how it is formed. To grasp what he means by meshwork, we must understand what it means for lines to interweave. Ingold makes this understanding more explicit by comparing the behaviour of threads in cloth to the lines within the meshwork. He states that 'the lines of the meshwork are as intrinsic to its constitution as are threads to the constitution of cloth' (Ingold 2017c, 25). Just as cloth exists through the connecting of threads, the meshwork exists because of the interweaving of lines.

Understanding arises from a shared agreement on the meaning of words. For this reason, in her classification of fabric structures, Emery defines words such as 'weave,' 'fabric' and 'textile' with specific meanings. She writes:

The terms fabric and textile are differentiated on the basis of their literal meanings derivations: fabric (from the Latin *fabricare*, to make, to build, to 'fabricate') as the generic term for all fibrous constructions; textile (from the Latin *texere*, to weave) to refer specifically to woven (i.e. interlace warp-weft) fabrics (Emery 2009, xvi).

However, to support this linguistic understanding, she also incorporates numerous photographs into her classification. Her rationale for doing so is that when it comes to textiles 'words alone will almost inevitably prove inadequate' (Emery 2009, xi). It is, therefore, deemed necessary to support this understanding by using examples of things that can be seen.

Art historian T'ai Smith explores a similar idea in her discussion of the unpublished writings of Bauhaus weaver Otti Berger, a contemporary of Albers. However, according to Smith,

Berger recognised that although useful, a photograph of fabric 'often eclipses the perception of a fabric's texture, and the tactile contact with the surface is not always, necessarily, consciously recognised' (Smith 2014, 101). Smith goes on to highlight Berger's assertion that the ability to grasp intellectually depends on prior physical grasping (Smith 2014, 99-101). In short, there is no substitute for physically engaging with fabric to understand it more deeply.

Summary

Ingold describes his conceptual meshwork as composed of interwoven lines, likening it to lines of thread in cloth. Building on the assertions of Berger and Emery regarding the importance of physical engagement with fabric, I argue through this research that a fuller understanding of Ingold's meshwork can be achieved through hands-on interaction with the processes and products of weaving. While photographs or analyses of finished fabric can offer some insights, they still rely on prior experience with weaving. Direct engagement allows for a deeper analysis of how and why the lines behave as they do. This, in turn, leads to a more in-depth understanding of factors that impact the ensuing cloth. In this research, I explore the distinct qualities and visuality of specific lines, documenting their interweaving in photographs and presenting them in an exhibition. The behaviour of these particular interwoven lines is the source from which I identify factors that are significant to weaving and relevant to an understanding of the meshwork.

My research method aligns with Ingold's ideas. He asserts that knowledge is gained through direct experiences in the world. He argues that simply being told something or reading about it in a book does not amount to the acquisition of knowledge and advocates for not taking understanding for granted. He writes that for anthropologists and practitioners from other disciplines, learning involves converting 'every certainty into a question, whose answer is to be found by attending to what lies before us, in the world' (Ingold 2013a, 2). By taking what we assume to be true and exploring it in practice, we gain fresh insights. Gaining knowledge becomes an active process of engagement, rather than a passive acceptance.

It is a process not confined to the mind; rather, thinking occurs through engaging with things. Ingold states that it involves 'not taking literal truths metaphorically, but taking metaphorical truth literally' (Ingold 2021, 15). To clarify his point, he offers the example of comparing his 'digging for words' to a crofter digging for peat, and his pen to a spade. He argues that physically engaging in the act of digging in the earth is a means of uncovering the 'deeper truth' of this metaphor. Lessons learned from this physical experience will then inform his 'thinking on the page' (Ingold 2021, 15). Ingold emphasises the importance of hands-on practice in knowledge generation. Similarly, in my research, I directly engage with the

interweaving of thread lines, reflecting on what this physical process can reveal about the construction of the meshwork. My weaving can therefore be viewed as the equivalent of Ingold's digging.

Chapter breakdown

This dissertation opens with a literature review that explores Albers' motivation for writing *On Weaving*. Following this is a discussion of Albers' understanding of an 'event' and the relevance of her assertions to my research. In this section, *The Event of a Thread* by Ann Hamilton is also discussed. Works by Anne Wilson, Ainsley Hillard, and Chiyoko Tanaka are examined as they, too, use what Albers refers to as 'evident facts' to examine ideas and concepts beyond cloth creation. Building on this, I explore Ingold's anthropology and its relationship to art, outlining how my research engages with both the theories and practices of others. I examine the implications of Ingold's concept of meshwork for my study and identify two key research questions that guide my practice-based inquiry. I then review the literature that has informed my methodological choices, situating my practice within a history of art-making in which yarn, through its role in weaving processes, is understood as having agency in what is created.

Following the literature review, Chapter 2 explicitly states that through this study, I follow a practice-as-research methodology as outlined by Nelson. In this chapter, I discuss the rationale for choosing this approach to answer my research questions. I also explain why creating samples is a critical part of my research process. Observations of the samples – both on and off the loom – are examined using key questions. These are derived from philosopher Clive Cazeaux's concept of the 'metaphoricity of materials.' The chapter concludes by identifying five key areas in which the materiality of the lines of yarn has an impact on their behaviour and the ensuing structure that they create. These five areas become the subject matter of five subsequent artworks that are explored in Chapters 4-8.

Chapter 3, *Samples* (the name given to the artwork composed of the samples), highlights observations made during its creation. These observations are used to explore how Ingold's categorisation of lines into 'threads' and 'traces' can be understood. *Samples* is also used to explore the relationship of individual components to the creation of a whole. In this dissertation, the terms 'relationship' and 'relate' are used to refer to the way that two or more elements can impact and connect with each other.

Chapter 4 focuses on *Satin* and questions how the relationship of lines impacts the texture of what is created. It uses Ingold's concept of a 'thing' to propose a way of understanding weaving as dynamic when off the loom. It proposes that pattern is an inevitable part of Ingold's meshwork. It also explores how the weaving process creates additional lines,

namely stripes. In this chapter, it is suggested that striped lines could support an understanding of how non-tangible lines could also reside in Ingold's meshwork.

Chapter 5 focuses on the creation of *Moving Warp*. This work is created without a reed or beater. A reed is usually made from metal strips held together much like a comb, through which warp threads are threaded. A reed can also be a beater, which is a tool used to beat the weft threads into position. How the lines of yarn behave within this specific circumstance is discussed in this chapter. Knowledge generated through observing the behaviour of these lines is used to question how environmental restraints impact the behaviour of the lines and the subsequent woven structure.

Moving Weft is discussed in Chapter 6. This work is created using yarns of different weights as warp and weft.¹ The behaviour of the warp and weft because of differences in their construction is discussed. This work combines different weave structures; unlike *Satin* the striped lines that are created exist because of differences in texture. *Moving Weft* is used to explore the concept of texture and its place in Ingold's meshwork.

Chapter 7 explores the role of tension in weaving through the creation of *Loop*. In this work, the tension of the warp lines is inconsistent. Observations focus on how the amount of tension can impact the behaviour of the warp lines and their ability to interact with other lines. The distinct roles of warp and weft are also examined to understand how the line's properties affect its interactions in the weaving process. In addition, knowledge of how the lines move within this work is used to explore how lines could also move within Ingold's meshwork.

Curl discussed in Chapter 8, was created to explore how the structure of what is created is impacted by what the lines have been through prior to being woven. This chapter focuses on the relationship of twist to the creation of yarn. The imposition of twist is seen as the application of a force. The role of forces and the impact that they have on the behaviour of lines is discussed in relation to Ingold's assertions that lines move in response to a field of forces (Ingold 2011, 86).

Materials is discussed in Chapter 9. This work is created using a range of different lines of yarn. My artwork explores how the behaviour of each line is impacted by its materiality and

¹ Yarn count or weight is a system weavers use to understand the thickness of a yarn. Many yarns are very fine so their thickness cannot be easily measured. Yarn count is the relationship between the length and weight of the yarn within a given measurement.

how its materiality can impact the behaviour of other lines. The position of lines and weaving within 'space' is discussed in light of Ingold's assertion that 'space' refers to something empty. In this context, 'life' and, therefore, 'line' cannot be thought to exist in space.

Ever-Evolving, discussed in Chapter 10 was deliberately created to explore Ingold's notion that a weave can continually evolve. This work involves three iterations of weaving. Through the combining of each weaving in another, 'weaving' is understood to evolve. This chapter interrogates how this work can offer a particular way of understanding how a woven form can grow in width, length and depth. Knowledge of how this can happen is used to suggest that lines in Ingold's meshwork can correspond in various directions.

I conclude this dissertation by consolidating the knowledge generated in the creation of the woven artworks discussed in the preceding chapters. I explain how this knowledge deepens understanding of Ingold's concept of meshwork, and I explore the implications of this understanding for Ingold's broader assertions about the world. I also explain how, through my research, 'weaving' can be thought of as a dynamic process at all stages, both on and off the loom. Furthermore, the methodological approach used in this study could be applied to other theories that also reference weaving. Exploring these connections could, like the findings of this study, yield fresh theoretical insights and inspire new areas of research for weaving as an art form.

Chapter 1 Literature Review

This chapter is divided into four sections. The first section focuses on *On Weaving* by Anni Albers, considering her rationale for writing. It then explores the concept of 'the event of a thread' as described by Albers. This is followed by an investigation of specific artists whose work, much like my interrogation of Ingold's meshwork, uses the interplay of yarn lines to engage with and explore theoretical concepts that extend beyond those associated with the creation of fabric.

The second section examines in greater detail the relationship between Ingold's anthropological theory and art practice, highlighting how my research builds on the theory and practices of others. The third section then considers the implications of Ingold's meshwork for my research, particularly in framing materials as possessing agency. This discussion draws on the theories of Ingold, anthropologist Stephanie Bunn, and Cazeaux. This section concludes by identifying my two main questions that have guided the focus of my practice-based research. The final section reviews the literature that has informed my methodological choices and supports the approach I have taken to answer these questions.

On weaving

Albers' stated aim in writing *On Weaving* was not to provide a how-to book for other weavers or a summary of textiles. Instead, she sought to 'comment on some textile principles underlying some evident facts' (Albers et al. 2017, ix). Essentially, she examines the weaving processes that create particular fabrics and their distinctive qualities. By examining how and why woven fabrics are formed, she is able to identify concerns that, although relevant to textiles, may also have resonance with areas outside the weaving process.

Smith, writing about *On Weaving*, states that it 'presents a field of thought, it does not produce concepts about this medium or craft rather takes its lead – yields concepts out of it' (Smith 2013, 77). In other words, through the process of exploring the medium and the articulation of these discoveries in the book, ideas and understanding develop that resonate with concepts beyond weaving itself. Smith argues that this is evidenced in the fact that the book is structured so that it begins with chapters such as 'The Loom' and 'The Fundamental Constructions' before exploring more theoretical ideas such as 'Tactile Sensibility.' This structure establishes practical knowledge as the foundation for theoretical reflection. The emphasis is on what the act of weaving reveals, and how such insights might open up new ways of thinking in other fields.

Albers states that she hoped to attract an audience composed of non-weavers and people in other fields that encompass textile problems (Albers et al. 2017). She is therefore asserting

that the knowledge and problem-solving approaches developed through her weaving practice could have broader applications. For example, Albers explores the relationship between aesthetics and structure. She argues that a material's properties are not limited to its surface qualities but also include its inner characteristics, which, though invisible, are crucial to its behaviour and the forms it can create. She emphasises that this understanding, relevant to weaving, is also relevant to technology and science (Albers et al. 2017, 45).

She asserts that starting from a defined field, in her case weaving, can lead to 'a realisation of ever-extending relationships' (Albers et al. 2017, xi). In other words, connections can be formed from an initial starting point, and over time, these connections evolve and multiply. Albers goes on to state that no matter what other subjects are seen to have a connection to weaving through an exploration of the process, ultimately, they all begin with and can 'be traced back to the event of a thread' (Albers et al. 2017, xi). Put another way, while weaving can contribute to other fields and may generate expanding and evolving lines of inquiry, these broader connections remain fundamentally grounded in an understanding of weaving itself, specifically, the interaction of threads.

The event of a thread

According to Smith, Albers' notion of an 'event' was influenced by the writings of philosopher Alfred North Whitehead. Smith writes that Whitehead's view of events meant that they were 'always tangential to other events, continuously opening into new lengths or vectors of "pretensions"' (Smith 2013, 80). Events are therefore viewed not as powerful disconnected moments but as something that emerges because of what has come before. One such example used by Smith is the event of a sunset occurring because the sun has previously risen (Smith 2013, 80).

A parallel can be drawn between Ingold's presentation of lines and Albers' understanding of 'events.' Both involve a recognition that they do not exist in isolation. They exist because of what has come before them and what is taking place around them. The similarity between Albers' understanding of 'events' and Ingold's understanding of 'lines' is further exemplified by Smith, who states that Albers 'found a new understanding of her medium – not as object but as event' (Smith 2013, 78). In this context, the creation of a weaving is not seen as an isolated occurrence, but rather as a responsive process, one that takes place because of previous interactions and also impacts future developments.

Weaving involves multiple threads, so it can be understood as an 'event' or a series of interconnected 'events.' This understanding of weaving aligns with Ingold's concept of the meshwork; neither should be seen as a completed object but rather as the creation of a form through evolving and interacting processes. As explained in the introduction, the lines in the

meshwork emerge from interactions between materials and forces. This process both influences and is influenced by the formation of other lines, and together these interactions give rise to the meshwork itself. By applying Albers' idea of weaving as an event or multiple events, the meshwork can similarly be understood as an event or a collection of events.

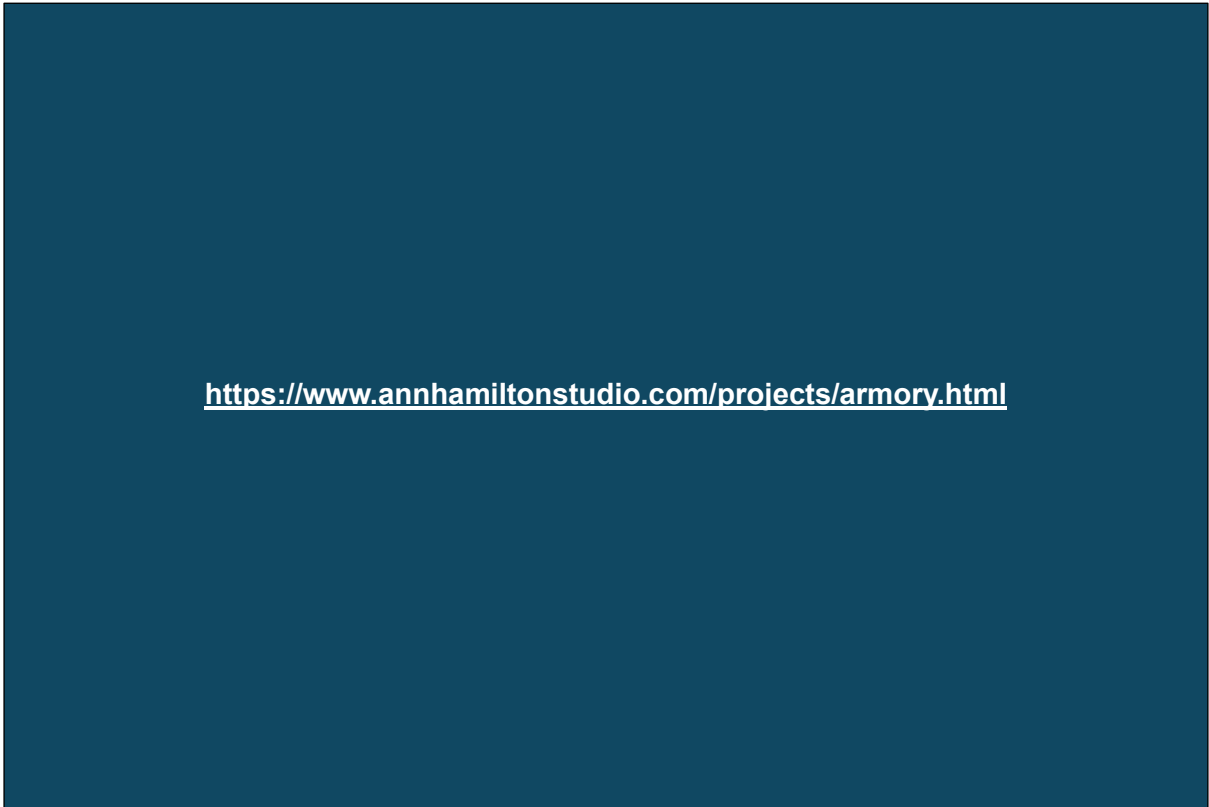
Albers' presentation of an 'event' as something that emerges from prior circumstances is also relevant to contemporary weaving. The history and legacy of all weaving can ultimately be traced back to the first interaction of warp and weft. Much like Ingold's meshwork – an ever-evolving, growing and moving structure – the past and present are in a continuous state of mutual influence: what takes place in the present is impacted by what has happened in the past, and our present perceptions impact how we understand the past. Weaving today does not exist in isolation; rather, it is shaped by and builds upon the legacy of past practices, historical techniques, traditions, and innovations.

For Albers, there is value in this legacy. She writes, using the language of walking or wayfaring, that she looked back into historic textile developments 'for the sake of looking forward from a point way back in time in order to experience vicariously the exhilaration of accomplishments reached step by step' (Albers et al. 2017, 34). The work of Albers and Sheila Hicks, whom I will discuss in the final section of this review, can be understood as connecting with this history. Both Albers and Hicks draw directly on the weaving techniques associated with Peruvian textiles, with Hicks' work also building upon Albers' legacy. Although I do not directly reference Peruvian textiles, my practice is informed by Albers and Hicks. My research combines hands-on weaving with studying the work of others. In line with Albers' understanding of the term 'event,' my work can be understood as part of this continuum or line, as described by Ingold.

Smith argues that 'the event of a thread' can be understood as a metaphor – a singular action that enables other activities and connections to unfold (Smith 2013). In textile processes, what is created in the present is literally connected to what has gone before. This refers, for example, to threads interacting with other thread lines, as seen in weaving, or looping into itself, as in knitting or crochet. Seen in conjunction with Albers' rationale for writing, *On Weaving* – that knowledge of textiles can be useful in other disciplines – suggests that in other fields, too, everything can be traced back to the initial point of connection. 'The event of a thread' can thus be understood as that foundational moment that enables countless other connections to emerge. From this singular starting point, structures, ideas, and relationships continue to grow and evolve; one connection leads to many more. Weaving in this context can be thought of as a metaphor for the development of multiple connections.

Ann Hamilton: The event of a thread

Albers' ideas inform Artist Ann Hamilton's exploration of the notion of connectivity in an installation piece titled *The Event of the Thread* (figure 2). Visitors sit on swings connected to a large fabric. As they swing, their movements impact the movement of a large curtain, which impacts the experience for others. Connectivity is further exemplified in other aspects of the work, which involve performers and the public touching, speaking, reading, listening and writing. The swinging is accompanied by the noises of pigeons, a symbol of the connection between animals and humans. The pigeons are released as part of the performance, referencing their role as messengers (Hamilton 2013).



<https://www.annhamiltonstudio.com/projects/armory.html>

Figure 2 Ann Hamilton, *The Event of a Thread*, 2012-13.

Hamilton builds on Albers' ideas. This work is carefully constructed to establish numerous connections while also allowing new ones to emerge. It is created through a network of interconnected processes, or what Ingold might describe as a 'meshwork.' The work demonstrates how one event impacts and is impacted by others. Just as the formation of fabric begins with the simple interaction of threads – the 'event of the thread' – and depends on these connections for its existence, so too is everything in the world fundamentally interconnected. What is created in the present cannot be separated from the events that have come before. The connections, happenings or events in *The Event of a Thread* are not only those which have been orchestrated by the artist, such as the actors, pigeons, and

swings, but they also include the involvement of members of the public. The connections are vast and may be thought of as extending to stories told of this work and even its inclusion in this study.

Hamilton writes that the condition of 'the social is the event of a thread. Our crossings with its motions, sounds, and textures are its weaving; is a social act' (Hamilton 2013, 8). A social act requires a connection, an 'event.' The collection of connected 'social' events is likened to threads coming together, leading to the creation of fabric. In this context, Hamilton's work could be thought of as a means of understanding the 'social fabric' which is itself a metaphor for understanding society and is often used in the context of needing repair.

Hamilton builds on Albers's legacy by quoting her in the title of the work, thereby offering another example of an 'event.' Through her references to weaving processes, Hamilton's work can also be seen to explore what Albers refers to as a 'tangential subject' that comes 'into view' through the exploration of 'long-established facts and processes' of weaving. Weaving is a means by which fabric is created, yet reflecting on what occurs and why can reveal connections to other areas of inquiry that extend beyond the act of weaving itself. Other artists have also built on the idea that weaving can be used to comment on and generate understanding of other fields beyond the creation of fabric. Three such examples will be examined in more detail in the next section of this chapter.

Anne Wilson, *Wind-Up: Walking the Warp*

In Anne Wilson's work *Wind-Up: Walking the Warp* it is the warping up process that is understood and forms the basis from which other ideas are explored. This performance piece has had several configurations: figure 3 occurred in Chicago; figure 4 shows a similar performance in Houston.

<https://www.annewilsonartist.com/windup-chicago-walking/>

Figure 3 Anne Wilson, Wind-Up: Walking the warp, 2008

<https://www.annewilsonartist.com/walking-houston/>

Figure 4 Anne Wilson, Wind-Up: Walking the Warp Houston, 2010

Wilson is taking the warping process and using it as a means of making connections beyond the activity itself. In weaving, yarns of equal length are measured on a frame before being threaded onto the loom. In *Wind-Up: Walking the Warp*, the performers lay down, count and position the warp yarn in a carefully choreographed rhythmic set of movements. The process is methodical, physical, and time-consuming. It requires rhythm and repetition. The use of 'warp' in the title of *Wind-Up: Walking the Warp* suggests that the yarn should be perceived as a warp. As a clue to the audience, this skilled physical labour evokes the processes involved in making fabric. Without a knowledge of the process of weaving and the significance of a warp, this work could be understood as a performance with yarn. Seen as a warp, however, the performance is anchored in the context of textile production.

Wilson states that this time-consuming work contrasts with the 'offshore' production of fabric outside the US, which she describes as taking place under 'questionable working environments and questionable practices' (Wilson 2008, 1). The slow, deliberate movements of the performers are reminiscent of parts of a slow-moving machine. Unlike the rapid pace of much modern textile production, where processes can become imperceptible due to the speed of execution and the urgency to meet demands, these movements allow each action to be perceived as a distinct unit within a larger whole.

In addition, Wilson states that she deliberately used the 'yellow green neon-coloured thread of urban safety gear' (Wilson 2008, 1), a colour used to signal caution. The use of this colour is seen as ironic it makes a connection to clothing used to promote health and safety. Its inclusion can prompt questions about working conditions and safety standards within the textile industry. In this context, the performers are not portrayed as unique individuals, but rather as cogs in a questionable system, serving the needs of the 'machine' – or, in this case, the US consumer.

This work provides an example of a 'textile principle' (Albers et al. 2017, xi). A warp is organised and planned before a weft is introduced. Any flaws or misalignments in the warp persist throughout the fabric, influencing the entire outcome. This highlights the importance of initial planning and structure: what is established at the beginning shapes everything that follows. Similarly, it can be argued that the foundational principles underlying the textile industry have a direct impact on the quality of its output. The current state of the industry, which Wilson critiques, is a consequence of past decisions that shaped its present structure and behaviour.

Wilson states of this work that 'in a way we were working from the inside of a process to understand something about time, materiality, and cultural production' (Wilson 2008, 1). The time and care devoted to the process, the treatment of the material, and how it responds to

various interactions all impact what is created. It is through the act of making that questions emerge, leading to a deeper understanding of the process and the subsequent ability to draw parallels between this stage of weaving and broader considerations of time and production within the textile industry. As will be discussed in chapter two, this understanding can be referred to as 'insider' knowledge – understanding gained through practice.

Ainsley Hillard: *Traces*

Ainsley Hillard created 'Traces' (figure 5) to be exhibited in 'Mission Gallery' Swansea.

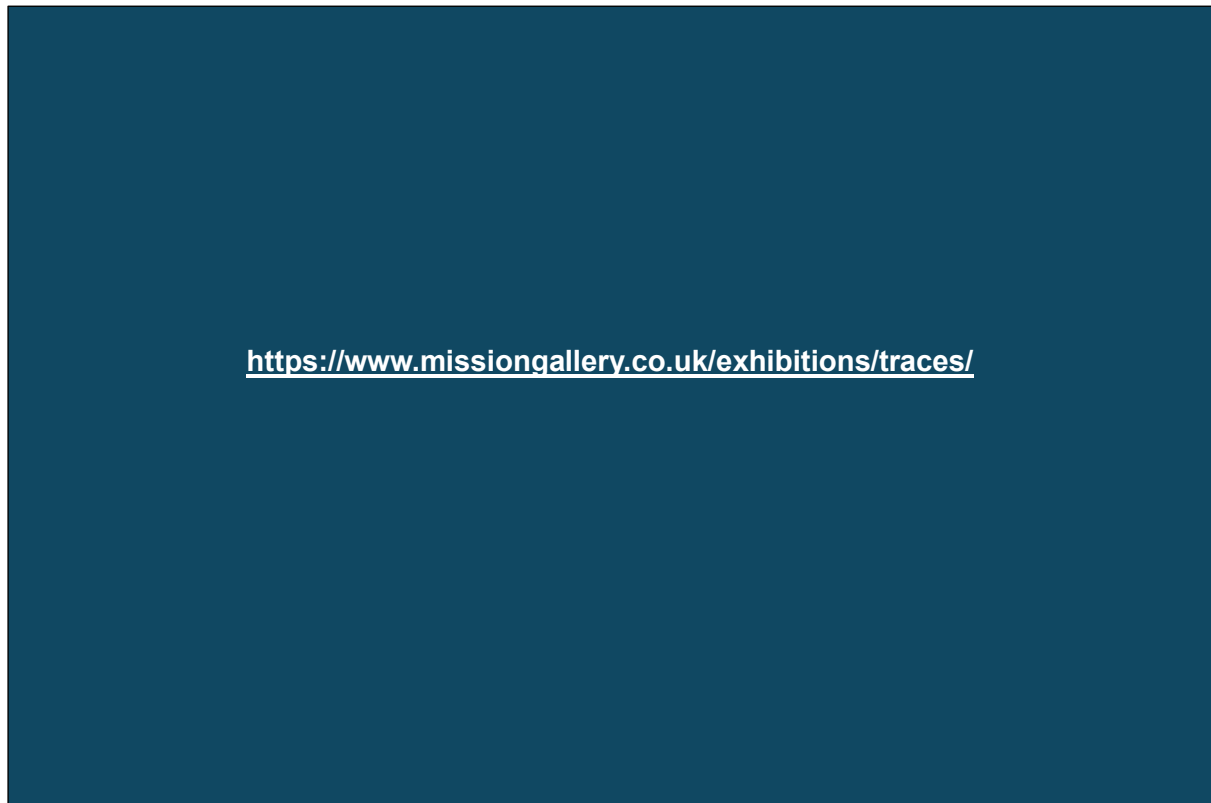


Figure 5 Ainsley Hillard, *Traces*, 2008

Like Wilson's work, in which the movement of the participants supports an understanding of weaving, Hillard says of *Traces* that 'it is only by moving and locating oneself in certain positions that images come to the fore. This bodily movement enacts the very process of weaving, a rhythmic interaction with space' (Hemmings 2012, 47). *Traces* is an installation, one image is visible through another, the way that viewers move around and through the woven panels establishes a connection to the physical process of their creation. Artist and researcher Angela Maddock writes of *Traces* 'as Hillard weaves so do we: passing between the warp threads, seen and lost, present and absent, weft wrapping warp, hidden and revealed' (Hemmings 2012, 47).

The work is located in the 'Mission Gallery' in Swansea, its setting carries historical significance, as the gallery was once a seaman's chapel and a space for community gatherings. Alongside the weavings, an audio track is played. The images of the chapel chairs are accompanied by the sound of writing, steps made by walking and the bells tolling. The building's use has changed, and whilst some may remember its past, those memories, can fade, transition and disappear. Hillard states that in her work, she strives 'to evoke the sensual, material, aesthetic and emotional dimensions of place' (Hillard 2013). This is achieved in *Traces* in part through the interplay of materials in the weaving process. The semi-transparent, light weavings hang in space. The synthetic weft threads contain heat-transferred photographic images. Their interaction with the monofilament warp causes the lines of yarn to move; the image distorts and unravels.

Hillard's use of what Albers refers to as 'evident facts' about fabric – its tendency to thin, fray, and deteriorate over time – serves as a means of exploring ideas that are beyond the material itself. The tangibility of textiles offers a way of comprehending memory as something that also fades and can become distorted. The movements of people in the exhibition will cause the panels to move. Over time, these movements will further impact the movement of the yarn within the weaving, gradually causing it to unravel even more. The specific combination of material and techniques used to create the woven panels allows for a clear recognition of warp and weft lines, most noticeable at the base where the work is fraying. What has been created is then clearly seen as distinct lines coming together. The characteristics of the work arise because of the characteristics of the materials and their interplay. Using this knowledge, the woven panels in *Traces*, like the chapel, can be thought of as a site of communal gatherings, characterised by the distinct interactions and experiences that take place within them.

Chiyoko Tanaka: *Three squares. Blue Threads and Sienna*

Artist Chiyoko Tanaka explores time through the medium of weaving. Tanaka states that she is 'weaving time' (Millar et al. 2002). She goes on to say, 'I am trying, through my working process, to transform the inherent logic of time into the inherent logic of space and vice versa' (Millar et al. 2002,18). In other words, she is using her practice to generate an understanding of the invisible passage of time through visibly making in space. She, like Wilson, is working 'inside' a process to generate an understanding. In this context, what she is making can be thought of as a metaphor – a means of understanding one thing in terms of another. Tanaka states, 'for me, the act of weaving, as the weft threads accumulate one by one, is a representation of time passing away; texture acting as the locus of the present time' (Tanaka 2012).

A basic principle of weaving is that it grows one line at a time. Researchers Viveka Berggren Torell and Ulla Ranglin recognise the connection between weaving and time. In *Knowledge in action in weaving*, they describe a weaver's response that 'with a phenomenological wording' they described the feeling of weaving 'as "being there" – being in the weave: "You are in it! I am here," she said and pointed at the threads in front of the loom' (Berggren Torell and Ranglin 2014, 34). A principle of weaving is that it is processional; the work advances and grows from a particular point, and it is difficult to go backwards.

In Tanaka's work *Three Squares. Blue Threads and Sienna* (figure 6), there are three key stages in its creation: dyeing of the yarn, weaving the fabric, and grinding into the fabric once it is off the loom. Grinding describes the technique whereby Tanaka lays the fabric on the floor and rubs in brick, soil, or mud. This can be seen in figures 7 and 8, which are screenshots from a film.

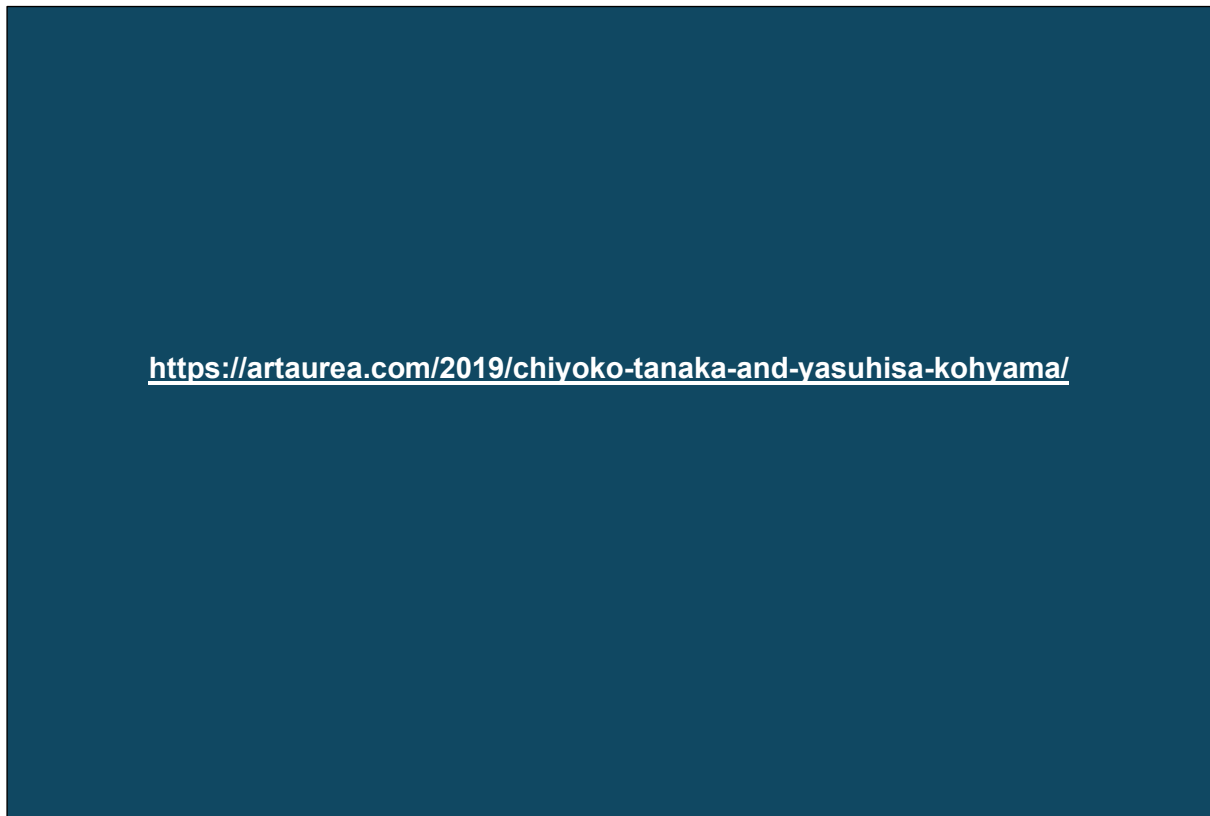


Figure 6 Chiyoko Tanaka, *Grinded Fabric – Three Squares. Blue Threads and Sienna*, 2010

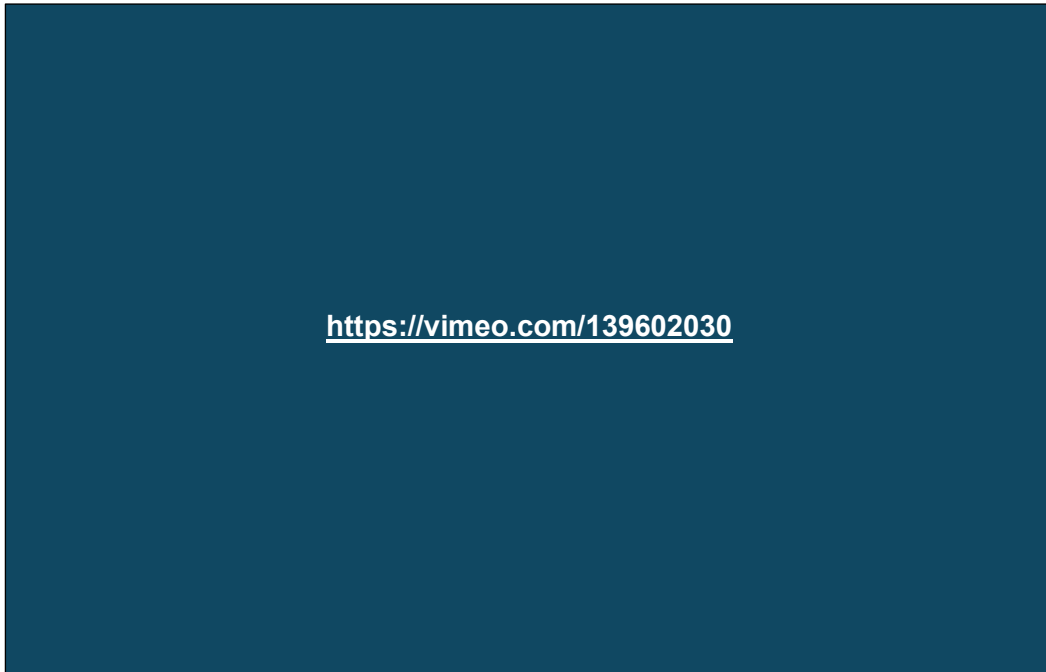


Figure 7 Christo Zanartu, Textile Magicians on Vimeo, 1996

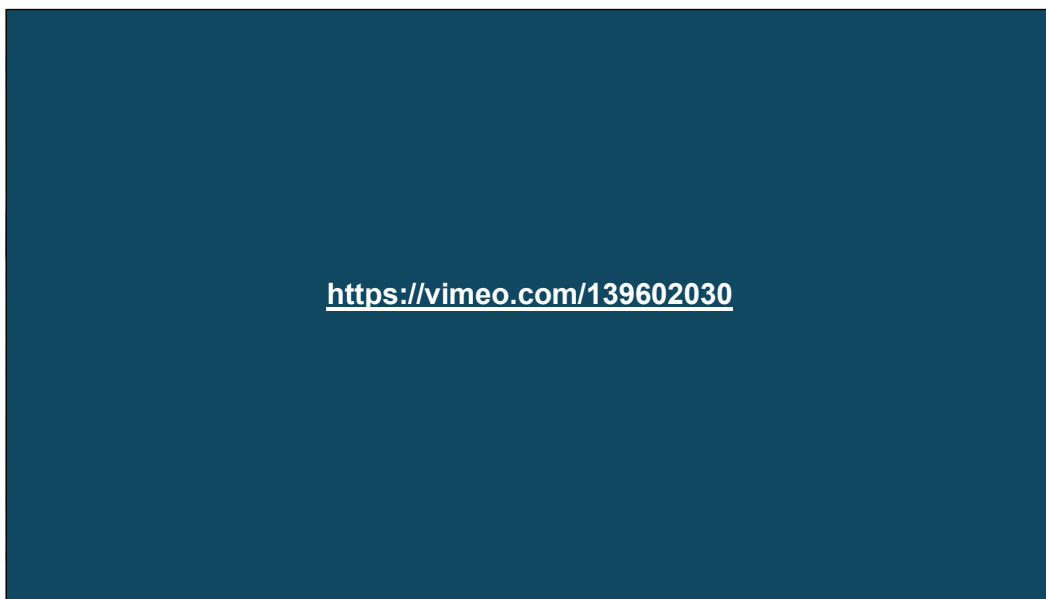


Figure 8 Christo Zanartu, Textile Magicians on Vimeo, 1996

Tanaka's choice to leave some of the warp threads exposed reveals the underlying structure. If we take her weaving as the locus of present time, we can see that the visible becomes invisible – the weft covers the warp, and the 'now' occurs further up the warp. It could also be argued that the invisibility of time has been made visible through the application of the weft, which acts as a marker of time passing. The past is understood as the section that has already been woven. The warp has been covered by the weft. The 'now' is the section that is being woven, and the future is the warp lines yet to be engaged in the process.

Tanaka makes additional interventions when the work is off the loom to speed up the process of wear and erosion. She embeds and rubs the weaving with stones and bricks to cause the warp and weft threads to fray. This grinding method is another marker of the passing of time. Artist Takeo Uchiyama describes the process as Tanaka's attempt 'to capture the future through rubbing the fabric, as the texture of the earth is transferred onto the cloth' (Millar et al. 2002, 4). In this way, what is pertinent to weaving – the build-up of weft over warp, the movement of the threads, and their interaction with other materials, which in turn causes the fabric to erode – are all used to explore the 'tangential subject' of time passing.

Summary

The work of Hamilton, Wilson, Hillard and Tanaka draw on weaving principles that are the concerns of the weaver, such as order, rhythm, and the relationship of warp and weft. These are concerns that Albers has also discussed. As artists, they apply these principles not only to the process of making fabric but also to engage with ideas that extend beyond the material practice of weaving. They are using their media and knowledge of the weaving process to explore other areas of inquiry. They are attentive to how the tools, material properties and the actions of the maker impact what is created and generate a deeper understanding of associated ideas such as connectivity and the passing of time. Ideas emerge through thinking in and through the process of making. The work does not simply illustrate a concept but enables understanding to develop through close observation of what unfolds in practice. In essence, each artist uses the tangible processes of weaving as a means to explore and understand theoretical ideas.

Ingold's anthropology and art

In this chapter, I have highlighted artists who draw on textile principles to connect beyond formalist concerns. Albers' belief in the broader applicability of her field resonates with Ingold's assertion that understanding gained in one discipline can be useful in another. Ingold specifically focuses on the relationship of art to anthropology. He writes, 'there is much in common between the practices of anthropology and art. Both are ways of knowing that proceed along the observational paths of being with, and both, in doing so, explore the unfamiliar in the close at hand' (Ingold 2011, 241). He also describes art and anthropology as 'future-oriented disciplines' (Ingold 2019, 659). He identifies four principles that art and anthropology share: 'generosity ... openendedness ... comparison ... to be critical' (Ingold 2019, 661). In brief, he suggests that both practices are based on inquiries that involve paying attention and listening, allowing things to be revealed through the process. There is

also an awareness that, although one route is chosen, other paths remain possible. Both practices share an acknowledgement that there is a need for improvement in the world.

Ingold's written reflections on how he perceives artistic practice as a means of explaining processes in his own discipline, anthropology, have proven useful to artists. He draws on the field of art to inform his anthropological work, and in turn, artists engage with the knowledge he generates, bringing it back to their own field. For example, Alison Rees and Tess Barnard use his ideas as part of their methodology. They explore specific concepts that Ingold has written about and use them in conversation with their practice, at times examining and even 'testing' Ingold's propositions in the context of their own making.

Rees, applies Ingold's concept of wayfaring as a methodological approach to her studio practice (Rees 2021). As discussed in the introduction, a wayfarer responds to what they encounter as they move within their environment; one movement flows into another. Ingold contrasts wayfaring with transport, perceiving the latter to have beginnings and endings. A wayfaring journey, in comparison, evolves through experiences and discoveries made along the way, which are not predetermined or predictable. It is responsive and improvisational. Ingold describes artists as 'itinerant wayfarers' (Ingold 2011, 216), likening the way artists interact with their materials and processes to the observations of a wayfarer in the environment.

In her PhD dissertation *Turning the Page: A New Dimension to the Language of Ceramics with Reference to Wayfaring, Porcelain Paperclay and the Archetype of the Paper Page* (Rees 2021), Rees draws on Ingold's view of wayfaring to inform her understanding of her studio practice. For Rees, this practice involves making clay pages. She explores the notion of wayfaring in relation to her practice by literally wayfaring in her locality. During these walks, she is attentive to what she observes, using this to inform the subject matter of her clay work. Rees describes the decision-making process of arranging her clay pages as 'composition by wayfaring. I look for footholds and adjust my orientation and pace; I look for harmonies and juxtapositions' (Rees 2021, 156). A mutually informative relationship developed between her studio practice and her wayfaring journeys. By physically engaging in wayfaring, she adopted an approach that aligns with Ingold's assertion, discussed in the introduction, that we should take metaphors literally, exploring what truth might lie within them (Ingold 2021, 15). Through this process, she gained a richer understanding of wayfaring's metaphorical potential for describing the creative process and her specific studio practice.

Ingold's notion of wayfaring as part of a research methodology can also be seen in the work of printmaker Tess Barnard. The concept of wayfaring that Barnard uses in her PhD *SLASH*

Embodiment, Liminality, and Epistemology in Relief Printmaking through the Linocut Process (Barnard 2018), explores how the process of creating a linocut relief print can be understood as fluid, one stage progressing to the next as steps in a walk. Printmaking involves machinery. Ingold makes a distinction between the working practices of a machinist and an artist (Ingold 2011, 59). The machinist is viewed as a traveller whose 'journey is more like a series of interconnected terminals' (Ingold 2011, 59). Ingold argues that machines can get in the way of what he describes as the 'intimate coupling between movement and perception' (Ingold 2011, 59). The machine is thought to interrupt the linear flow of making that he associates with wayfaring, and working with machines can be understood to resonate more with transportation – a series of points or actions, rather than a continuous flow of activity.

Barnard, however, argues against this understanding; she states that 'the motions of my body fuels that of the machine' (Barnard 2018, 120). In other words, where Ingold sees machines as separate – likening their use to terminals rather than steps of a walk – Barnard asserts that despite the lack of physical touch to the materials, the use of the press is still part of her wayfaring journey. In this context, Barnard identifies a distinction between her own lived experience as a maker and Ingold's theoretical understanding of the artistic process. There is a history of artists testing Ingold's assertions with their artistic practice and reaching different conclusions from Ingold in the process.

Artist and researcher Alana Jelinek argues that the discipline from which a researcher approaches a subject brings with it biases. Jelinek compares art historian James Elkins' physical engagement with materials to Ingold's. She states that Elkins aims to understand the skill of the artist that he already admires whereas Ingold aims to 'emphasise the commonality of all human experience' (Jelinek 2020, 42). Jelinek points out that these differences exemplify 'the bias and mores of their respective disciplines' (Jelinek 2020, 42). Using Jelinek's argument, it matters that we acknowledge that Ingold's description of art and engagement with arts practice is always conducted from the perspective of an anthropologist. He draws from art what he sees as relevant to anthropology. My argument is that Ingold draws on elements of weaving relevant to his meshwork theory, but that his knowledge of weaving is obtained from the perspective of anthropology in order to further anthropological theory, not art.

Artist and anthropologist Jennifer Clarke acknowledges the strength of Jelinek's argument (Clarke 2014, 179) and argues that using methods from another discipline can generate new ideas. However, she argues that the way knowledge is acquired shapes what that knowledge is about. She states that 'both means and ends matter' (Clarke 2014, 187). Clarke has been trained in both art and anthropology, and from this perspective, she writes:

that there are boundaries does not preclude the crossing of them, and in any case, both disciplines involve different practices embedded in different logics, using different methods, based on different methodologies. Within and between the disciplines these practices co-exist holding some things together requires holding other things apart (Clarke 2014, 188).

Clarke is pointing to an area that is vague and unknown, the 'within and between' disciplines. Knowledge from one discipline does not always apply to the other. In *On Weaving*, Albers explores weaving and things that weavers are attentive to. She is presenting knowledge informed by her practice. She does so because she believes that this knowledge is useful to other fields. She does not stipulate how it needs to be used, but recognises that it can be useful because there are points of connection between fields. Clarke is also suggesting that exploring this knowledge in another field can generate new ideas.

How my research builds on the theory and the practice of others

My research can be understood as an exploration of 'textile principles' (Albers et al. 2017, ix) and a critical examination of how engaging with these principles impacts how we can understand Ingold's woven meshwork. The overlap between Ingold's ideas and the practice of weaving, as well as the exploration of weaving-based research through the lens of his assertions, can be understood as existing in what Clarke describes as a place 'within and between' disciplines. I am exploring knowledge that lies between the act of weaving and Ingold's concept of the meshwork. I am asking what my understanding of weaving can contribute to the concept of the meshwork, and what Ingold's understanding of how lines behave in his woven meshwork can contribute to the practice of weaving.

Building on Barnard's comparison of Ingold's ideas with her own experience of making, and Rees's application of his concepts to her practice, my research project observes, and analyses interweaving lines to reveal differences and open up areas for further investigation within Ingold's meshwork. I examine how Ingold's framing of the meshwork as something woven can generate potential new lines of inquiry for weaving used within the field of fine art. Like Albers, I believe my findings gained through an exploration of 'evident facts' in the weaving process can be useful to others across different fields. Just as Hamilton, Wilson, Hillard, and Tanaka use their art to explore ideas beyond the act of making cloth, I use my art to investigate Ingold's meshwork and, by extension, his particular worldview.

Implications of Ingold's meshwork to my research

Rather than following a blueprint, Ingold describes the meshwork organically. In the meshwork, a line's development depends on its interactions with materials and forces, which are themselves subject to mutual influence. Consequently, the form of the meshwork is determined both by the intrinsic properties of its constituent lines and by the ways in which those lines interact with their environment. The lines of the meshwork are understood to have agency. What is created is the result of the interplay between the lines. Creating woven artworks to investigate line behaviour in the meshwork, therefore, requires that the yarn lines are also understood to have agency, with their behaviour impacted by their materiality. This approach to making and understanding the creative process is not new; in what follows I will show, my work builds on the ideas of other practitioners and researchers.

Bunn, writing about the role of materials in the making process, argues that artists and craftspeople do not impose order over matter. She describes the process as a 'working with rather than a doing to' (Bunn 1999, 15). In this statement, she is suggesting that making involves cooperation. Materials are not merely passive or subservient to the artist's intentions; rather, they actively contribute to the outcome. Bunn also emphasises that understanding how a material behaves is not confined to the initial encounter; rather, artists and craftspeople engage with the material 'as if each time was the first time' (Bunn 1999, 18). In this way, they respond to what unfolds during the process, rather than adhering to a preconceived plan, even when the same process is used, each artwork has the potential to generate new ideas and understanding. Bunn argues that this approach to making is not the following of a 'blueprint' (Bunn 1999, 15) but it is a process of being attentive to what is happening and responding accordingly. In so doing, the work can be thought to grow from the interplay of materials and artistic interventions.

Cazeaux also views materials as an active part of art creation and argues that being attentive to their behaviour during the making process is a form of research and knowledge generation (Cazeaux 2017). He argues that by observing changes in what is known of a material's properties at four different stages of the making process, we can observe that materials are 'active in introducing qualities and meanings to a work above and beyond any intention held by the artist' (Cazeaux 2017, 97). Although an artist has a sense of what they want to make, the exact final form of the work takes shape through the material's response to the artist. He asserts that it is through interacting with materials, that their properties can be taken 'somewhere else, have them evoke or become other properties (Cazeaux 2017, 94). The capacity for materials to be understood in new ways, and perceived differently from

their initial characteristics, is what Cazeaux terms 'metaphoricity': the 'metaphoricity of materials.'

Cazeaux argues that the way we handle and work with materials directly influences how we perceive and understand them. Consequently, he asserts that because artistic manipulation can reveal a material's properties, the process of making art should be seen as a site of knowledge generation. As such, artistic research is not limited to reflections on the final form (Cazeaux 2017); the making process itself is investigative, and the outcome is shaped by discoveries made through hands-on material engagement. Cazeaux's concept of the 'metaphoricity of material' highlights that, much like the 'as' or 'is' in a linguistic metaphor, how and in what context a material is handled can reframe our perception of it and, in doing so, generate new knowledge.

Summary

In this literature review, I have demonstrated that weaving in the field of fine art has been used as a means of exploring ideas and concepts beyond those directly associated with textile production. Albers' motivation for writing *On Weaving* was based on the belief that her knowledge, evidenced through the practice of weaving, was useful to other fields. The work of Hamilton, Wilson, Hillard, and Tanaka demonstrates how insights can be generated for other fields through the manipulation of lines of yarn in processes associated with weaving. These insights come from the perspective of the maker, directly engaged with materials. Albers, Ingold, Jelinek and Clarke all recognise that expertise in one field can be useful to inquiries in another. However, as Jelinek and Clarke assert, it matters that attention is paid to how and why investigations are conducted, as the motivations behind the inquiry will shape what is observed and attended to.

Ingold, through his meshwork theory, offers a perspective of the world as something in a continual state of movement and growth. He argues that this dynamic process can be understood as the creation of a line. His intention is to use the concept of the meshwork to challenge network thinking, which views the world as a collection of separate, bounded objects or points that merely connect with one another, rather than as something shaped by the ongoing growth and transformation of other things. For Ingold, however, everything in the world is in a state of constant change, with these changes both affecting and being affected by those around them. Essentially, everything can be viewed as a line or bundle of lines (Ingold 2015, 3). It is through the interweaving of these lines that this world, what he refers to as the meshwork, is formed.

Ingold uses weaving. He is not a weaver; his knowledge of weaving is limited, although he has engaged in the process of weaving, most notably basket weaving (Ingold 2000). The

level of understanding of the practice and the literal behaviour of the lines of yarn that is explored by practitioners like Albers may not be necessary for the points that he is making. As Clarke argues, not all knowledge from one discipline applies to the other (Clarke 2014, 188). This does not, however, negate the fact that knowledge exists about the behaviour of lines in weaving that Ingold has not referred to.

Ingold is an advocate for exploring what can be known in one field by engaging with a process used to understand another. When confronted with the assertion that lines interweave in the creation of a meshworked world, I ask supplementary questions, informed by my knowledge that not all lines interweave in the same way, and that many factors impact how the interweaving happens and the subsequent structure that emerges. Through this practice-based investigation, I address these questions, while also bridging a gap 'between' the discipline of weaving and Ingold's anthropological concept.

Ingold's woven meshwork is not a predetermined form; it evolves through the interaction of the lines, which are seen to have agency in what is created. Exploring his understanding of the meshwork through my weaving practice means that the lines of yarn with which I work also have agency. What is created is seen as a response to these interactions.

As a result of this literature review, I have identified two central questions that will be addressed through this study.

1. What additional knowledge can be generated about the meshwork through a practice-based inquiry into the behaviour of lines in handweaving?
2. What new perspectives emerge for weaving as an art form when explored through the lens of Ingold's meshwork?

Literature that informs my methodological approach

In the following section, I explore Cazeaux's theory of the 'metaphoricity of materials' (Cazeaux 2017, 100) through Hilliard's *Traces* (figure 5) and analyse works by Albers and Hicks to demonstrate how artists interact with and respond to their materials during the making process. This analysis is included to place my own practice within a broader history of art making and to show that my methodological approach builds on established artistic and theoretical traditions. My specific methodological decisions, to be discussed in the next chapter, have emerged from my engagement with the work of others.

Cazeaux identifies four areas where the properties of material impact what is created. First, observations can be made of how a material's properties change through handling. Second, observations can be made of changes in a material's behaviour when it is combined with other materials. Third, observations can be made of how the artist's physical actions are

shaped by how the material behaves. Fourth, observations can be made of how the behaviour of the material can impact the subject matter or meaning in figurative artwork.

To explain these ideas in context, I will reference the woven artworks from *Traces* (figure 5). Cazeaux's first point is that materials possess properties that become apparent through artistic manipulation. This can be seen in this example and in weaving more broadly. For instance, the strength of the warp yarn becomes apparent during the warping of the loom, while the manipulability, flexibility, and texture of the weft thread are revealed as it is wound onto the bobbin and positioned across the warp. The second point is that materials interact differently when combined. In Hilliard's work, the use of synthetic yarn as the weft and monofilament as the warp affects how the two elements grip each other. The smooth, non-fibrous nature of the monofilament prevents the weft from holding its position, causing it to slip and distort the imagery. The third point is that materials impact the behaviour of the artist. The lack of grip also influences the weaving process, as the monofilament cannot easily be tied to the loom, making it difficult to maintain even tension. Hilliard would have had to implement additional measures to secure the warp threads. When I used monofilament as warp, I had to tape the yarn to the loom, as seen in figure 9 and discussed in more detail in the appendix.



Figure 9 Nicola Moody, *With reed monofilament, in process*, 2022

I have chosen to discuss Hilliard's work because it includes clear visual imagery that supports Cazeaux's fourth point that materials can connect with the subject matter of representational art. *Traces* explores the fading of memory. The distortion of imagery, the glimpses of overlapping images through transparent layers, and the movement of the panels as viewers engage with the piece all reflect this theme. These effects are made possible by the specific materials chosen and how they interact.

Cazeaux's ideas resonate with Albers, who states, 'things take shape in material and in the process of working it, and no imagination is great enough to know before the works are done

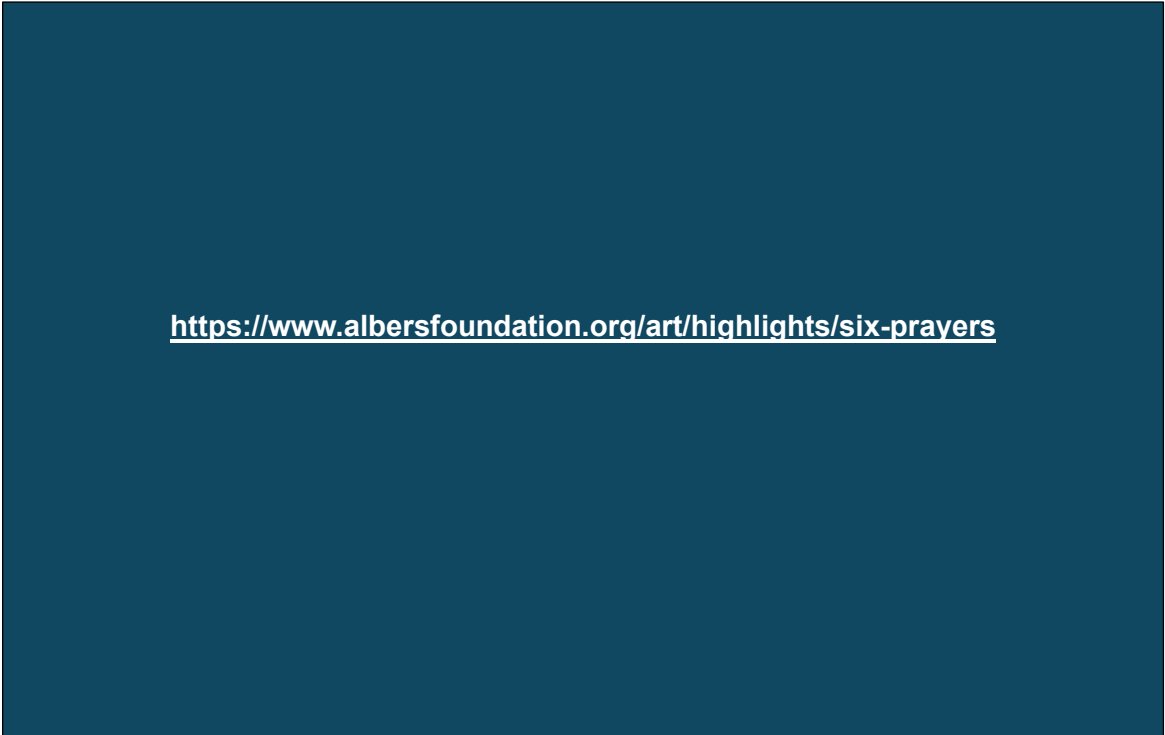
what they will look like' (Albers 2023, 92). Ingold also cites Albers as an example of an artist who sees the process of making as a form of correspondence with her materials (Ingold 2019, 661). In the next section, I will examine how the practices of artists Albers and Hicks can be understood as emerging through the interplay between artistic intention and material agency. In their work, materials are not passive but active participants that shape the outcome. Both artists can be seen as responding to the behaviour of yarn as they engage with it. Rather than being subservient, the material plays a determining role in the creative process. The works produced in this study build upon and extend the legacy of these artists

Anni Albers

Albers' understanding of the role of materials in the creative process is exemplified in her statement that she 'learned to listen to' and speak the language of her material, threads (Albers and Danilowitz 2000, 75). She describes the process of handling materials as 'a means of communication. That listening to it, not dominating it makes us truly active, that is: to be active, be passive' (Albers and Danilowitz 2000, 75). Time must be allowed to observe and respond to what the material is doing, which can be understood as being passive. This passive engagement, however, itself becomes an active form of doing. Like Bunn, Albers sees the process of making as a working 'with' materials rather than a 'doing to'.

Art historian T'ai Smith writes that Albers' understanding of material 'enables a movement from one space to another. In this system, any experience of material is never quite direct. It is only accessed metaphorically – as an experience of an experience' (Smith 2014, 146). In drawing on Albers, Smith suggests that materials possess a metaphoricity that becomes apparent through interaction. In this way, Smith's reading of Albers resonates with Cazeaux's assertions about the metaphoric nature of materials, indicating a shared perspective: that engagement with material in artistic practice can generate knowledge.

Smith also writes that Albers 'listening to her materials' did not involve discerning a code but rather responding to the way materials respond to her actions (Smith 2014, 146). Albers also states that materials 'obey laws of their own' (Albers and Danilowitz 2000, 73). These laws stem from the inherent properties of the material, such as its capacity to stretch or be pulled apart. The laws are also understood as classifications imposed upon them, such as colour, sound, and words. These classifications are shaped by human perception – we see colour, hear its sound, and ascribe words to it such as translucent. To explore these concepts in context, I will examine how they can be thought to exist in the creation of *Six Prayers* (figure 10 and 11).



<https://www.albersfoundation.org/art/highlights/six-prayers>

Figure 10 Anni Albers, Six Prayers, 1966–67



<https://www.albersfoundation.org/art/highlights/six-prayers>

Figure 11 Anni Albers, Six Prayers, detail, 1966–67

This work was commissioned to be a memorial to the six million Jews who died in the Holocaust. In practice, Albers' assertion that she listened to and communicated with her material can be understood as her asking questions of the thread. One such question may have been, 'how much can I pull before you snap?' The thread would respond through tactile interaction. Applying this idea directly to *Six Prayers*, a similar question might have been directed to the backing threads: 'how quiet are you?' I refer to the backing threads as those used to create what could be described as the background. The word, quiet, is used here to refer to discretion. It could also be expressed as how much will this thread stand out? To answer this question Albers would have to communicate with the yarn, considering its colour and how it relates to others. She is the one making the judgements, and as a result, the yarn could be seen as being subject to a law, a law that is understood through human perception. The surface qualities of the thread – whether it is shiny, smooth, even, reflective, or coarse – would need to be examined. The latter considerations will be particularly relevant to the structure of the weave. The weave structure has a role to play in its ability to be seen as 'quiet.' Through this exploration, a process of 'following the materials' has unfolded, creating a tactile dialogue with the threads.

To judge whether the yarn is suitable to create a quiet background, Albers must also assess it in terms of what else is going to be used. For the central areas, Albers used thicker weft threads and supplementary contrasting black and white threads as well as incorporating silver thread. The work is called *Six Prayers*; it is reminiscent of six scrolls; the thicker black and white threads could be seen as resembling writing. The use of silver suggests a precious quality, perhaps a further example of a 'law' imposed on the material. In this work, Albers' decisions are informed by her accumulated experience, with her knowledge refined through ongoing material interactions. The materials have behaved in particular ways through her handling. She has used the materials' texture, colour, and behaviour within the weave structure, leading to the creation of this work. Its creation can be seen as a form of correspondence between artist and materials.

Sheila Hicks

Hicks is a further example of an artist who uses weaving and is attuned to the behaviour of yarn in what she makes. For her, working with materials is an 'open-ended inquiry' (Applin et al. 2022, 5), through which she explores the outcomes of combining elements, wrapping fibres, creating loops, and letting yarn cascade. Through these interactions, Hicks discovers new possibilities that she incorporates into her work. In this way, she, like Albers, engages in a dialogue with her materials. Curator Michel Gauthier states that Hicks deliberately chose to work with textiles because it is 'one of the rare mediums in which the form never totally eclipses the material' (Gauthier 2018, 16). In her work, the material

remains central. The artwork is not created in a way that transforms it into something entirely different. Instead, it allows the inherent qualities of the material to be fully seen and explored, a process that, using Cazeaux's concept, could be described as an investigation into its 'metaphoricity'.

Her communication with her materials is exemplified in her *Minimes* small-scale tapestry weavings created on a portable frame, of which she has made hundreds (Applin et al. 2022). In the creation of these works, she manipulates her materials in response to things she has noticed, felt, and experienced. In these works, Hicks does not conform to the traditional techniques of tapestry weaving in which the repetitive under-over relationship of warp to weft is tightly packed and the form emerges slowly. Instead, she works with the materials alongside a sense of what she is seeking to convey. As Gauthier states, 'her attention to materials takes precedence over the sense of code' (Applin et al. 2022). In other words, she is not bound by but rather builds on the traditional uses of yarn and explores what can be done with them.

In *Claudia's Perpetual Motion* (figure 12), for example, the bottom section consists of even interactions. This pattern, however, changes with the introduction of the turquoise yarn.

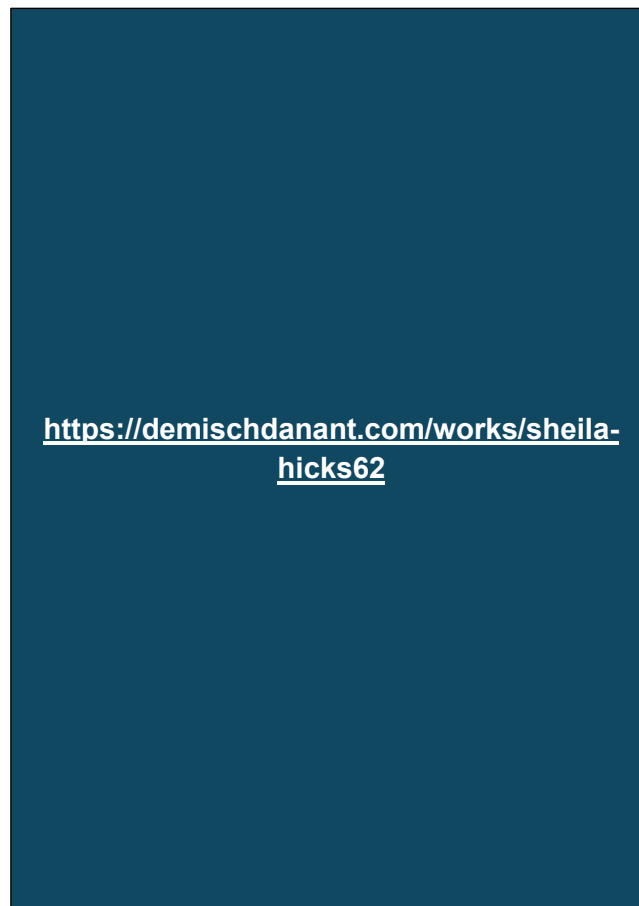


Figure 12 Sheila Hicks, *Claudia's Perpetual Motion*, 2012

Gaps appear, and the weft is wrapped around the warp. Additional colours are introduced, and different amounts of weft are wrapped around specific warps. In other sections, the weft does not run parallel with the warp, it traverses the other lines in a diagonal. The warp lines usually concealed in tapestry weaving are left visible. The lines, materials, and colours are not hidden within the structure; instead, they are integral to the artwork itself. The lines are interwoven, but in varied ways that do not follow fixed rules. In part, it is the diversity of ways that lines can be interwoven, many of which are exemplified in Hicks' work, that has prompted me to question how lines interweave within the meshwork and how these variations impact the interactions and structure of what is woven.

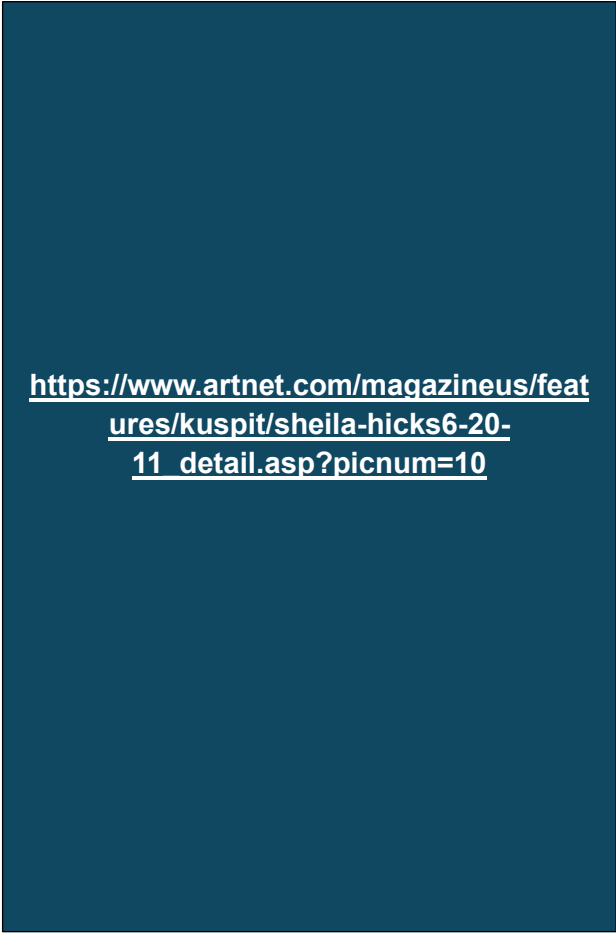
Hicks asserts that viewers can use the titles of her work as a 'path of entry' (Applin et al. 2022, 145). The title acts as a steer to how the work can be understood. In *Claudia's Perpetual Motion* (figure 12), the title immediately suggests an endless dynamism about the work. In this way. It guides the viewer toward understanding the work as something in constant flux. This idea is reinforced through the varying densities and arrangements of warp and weft. The work's form comes from the continuous interplay of warp and weft, some close interactions and others where the warp can move more freely. There are no loose ends, no fringe, the warp is continuous, and while it is identified as a warp, its role is not simply to be the support for the weft. Throughout the work, the lines, and by extension, the materials, are engaging with one another. In this sense, the lines can be understood as active. The work exists because of this ongoing engagement, or, using the title of the work, their 'perpetual motion.'

The notion that materials are still active in creating an artwork even when the artist is no longer manipulating the material is further emphasised in Hicks's larger works, many of which are not woven. While Hicks' interaction with materials is central to the making, the material continues to play an active role beyond this stage. In her recent exhibition *Off Grid*,² for example, she did not want walls to be set up in the exhibition spaces to accommodate her work (Applin et al. 2022, 14). Instead, her artworks become part of the space and are thought to interact with what is seen through or around them, such as other visitors or changes outside the window. The work can also change and move because of draughts or wind, particularly pertinent for works displayed outside. Gauthier writes of her work, 'it is kept alive because it is part of the setting it resists formal reification' (Gauthier 2018, 32). Akin to Ingold's presentation of the meshwork, the artwork is not considered static or finished; rather, it is understood as an ongoing interplay of materials that engage with one another and with the surrounding environment. Similar to the meshwork, the artwork is thought to

² The Hepworth Wakefield 7th April – 25th September 2022

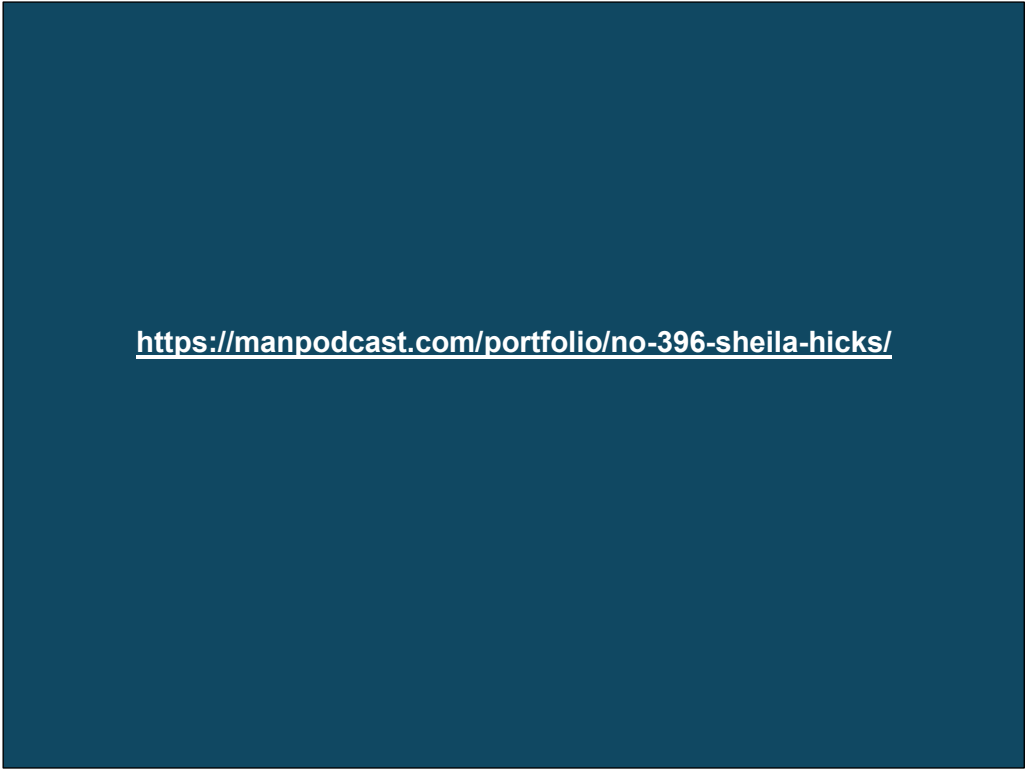
evolve; it is shaped and perceived differently according to changes in its environmental context.

May I have this dance shown in figures 13-15 is an example where the relationship of the artwork to space changes significantly. The material not only interacts or responds in particular ways due to the activity surrounding it in each installation, but in this instance, the work itself also looks quite different depending on the location and how it is installed. Hicks will have made decisions about what goes where, and just as she entered a dialogue with her materials during the making process, this conversation continues when the work is installed in a new location. In this way, the materials have agency both in responding to Hicks' interactions that led to the creation of the components of the work – in this case, the large, wrapped lines – and in how these components interact with their environment. The form of the artwork and the arrangement of its lines are shaped not only by Hicks's choices but also by external forces, such as gravity, as well as by its interaction with other elements, like the plinth on which it rests or the wall from which it is suspended.



https://www.artnet.com/magazineus/features/kuspit/sheila-hicks6-20-11_detail.asp?picnum=10

Figure 13 Sheila Hicks, *May I Have This Dance?*, 2002–2003



<https://manpodcast.com/portfolio/no-396-sheila-hicks/>

Figure 14 Sheila Hicks, May I have This Dance, 2003



<https://manpodcast.com/portfolio/no-152-sheila-hicks/>

Figure 15 Shiela Hicks, Mega Footprint Near the Hutch (May I Have This Dance?), 2001

Many of the materials with which Hicks works are in the form of lines of yarn, which, as shown in *May I have this Dance*, are also used to construct larger lines. As reflected in the titles of her recent exhibitions, *Lignes de Vie / Life Lines*³ and *Off Grid*, lines are a fundamental component of her work. The title *Off Grid* highlights the connection between Hicks' sculptural pieces and weaving but also points to how the material has been explored beyond its behaviour in weaving. Hicks created the thick lines in *May I have this Dance* by wrapping other lines together, a wrapping technique that references a process used in ikat weaving – specifically, the stage in which warp yarns are wrapped and dyed before the loom is dressed and the fabric is woven. Like the lines of yarn in Wilson's *Wind Up: Walking the warp*, these lines can also be thought of as warp threads and therefore have an ongoing link to the weaving process.

The title *Life Lines* clearly draws attention to both the visual importance of lines in her work and their conceptual significance. The exhibition spanned decades of Hicks' career, from 1950 to 2018. Given the title, it might be expected that the exhibition would be chronologically curated, enabling a clear indication of the order in which the works were created or perhaps 'came to life'. However, the life of these exhibits is not to be viewed in a prescribed order but as noted in the foreword to the accompanying exhibition catalogue, they are arranged to allow 'life's temporal landmarks [to] give way to the lived experience of the artwork itself' (Lasvignes and Blistene 2018). What matters, then, is not when the work was made but the experience it generates in the present. This method of engagement resonates with Ingold's concept of wayfaring rather than transport: instead of moving through the exhibition as if along a fixed route with predetermined stops, visitors are free to wander, responding to each encounter as it unfolds.

This approach mirrors Hicks's engagement with materials in her practice: there is a freedom to respond to what is encountered rather than following a 'sense of code' (Gauthier 2018, 16) or expected process. Similarly, just as her works, though complete in one sense, are not static – continuing to change depending on how and where they are installed and how they interact with their environment – the experience of the exhibition is not the following of a prescribed chronological line or route but is more in keeping with an 'open-ended inquiry'.

Summary

Cazeaux's concept highlights that attentiveness to the making process generates knowledge that unfolds through practice, rather than being predetermined. In the works of Albers and Hicks, materials actively shape the outcomes, and knowledge emerges through direct

³ Centre Pompidou in Paris 7th February – 30th April September 2018.

engagement with their behaviour and properties. Building on these insights, I use the physical engagement with the process of weaving to answer my research questions. While the techniques I use are not new, as Albers notes, they originate from ‘the event of the thread,’ what is new is the dialogue created by examining weaving through Ingold’s concept of meshwork, and conversely, exploring meshwork through the act of weaving. Rather than merely illustrating the meshwork, I investigate how it might develop, what factors influence its growth, and how understanding weaving as the coming together of distinct yet interconnected lines of yarn can offer fresh perspectives on how weaving can be used, experienced, and perceived within the field of fine art.

Chapter 2 Methodology

The previous chapter highlighted that knowledge from one discipline can inform another and that careful attention to the making process can generate new insights. This chapter outlines my methodological approach, which is informed by these ideas. To investigate Ingold's concept of the meshwork through handweaving, it is not enough to observe the finished fabric; I need to examine the behaviour of yarn lines during the weaving process. Practice is therefore a vital part of my research. As Seiler-Baldinger states, a deeper understanding of fabric arises through close attention to the making process. She asserts that 'it is undisputed that an exact description of a fabric must take both technique and structure into account' (Seiler-Baldinger 1992, xv). In weaving, the structure of a fabric is apparent once it is removed from the loom; however, a comprehensive understanding of what has been made requires additional insights into its method of production.

Biologist and weaver Ann Richards extends this argument by suggesting that further understanding can be gained through examining how the yarn itself is constructed. She notes that the 'character' of the fabric is shaped not only by the techniques of weaving but also by the processes used to create the yarn (Richards 2021, 36). The behaviour of yarn within the act of weaving is influenced by its prior interactions, for example, how it was spun or how it was tensioned during setup. A fuller comprehension of how lines behave in weaving – and by extension in the meshwork – acknowledges that their present characteristics are shaped by the conditions under which they were previously brought together. A practical investigation of weaving provides valuable insight into the fabric itself, and this knowledge can inform a deeper understanding of how the making process impacts both the structure and behaviour of the fabric. As the meshwork is also created through the interweaving of lines, this knowledge is relevant to gaining a fuller understanding of the structure and behaviour of lines in the meshwork.

Weaving serves as the lens through which I generate understanding of Ingold's meshwork. Performer and researcher Robin Nelson's presentation of 'practice as research,' informs my methodology. In the first section of this chapter, I will explain the relevance of Nelson's model to my inquiry. In the second section, I will discuss my use of sampling as a primary research method for addressing my research questions, along with the rationale behind my choices of material, structure, and colour.

Practice as research

Nelson has created a diagram to explain his approach (figure 16).

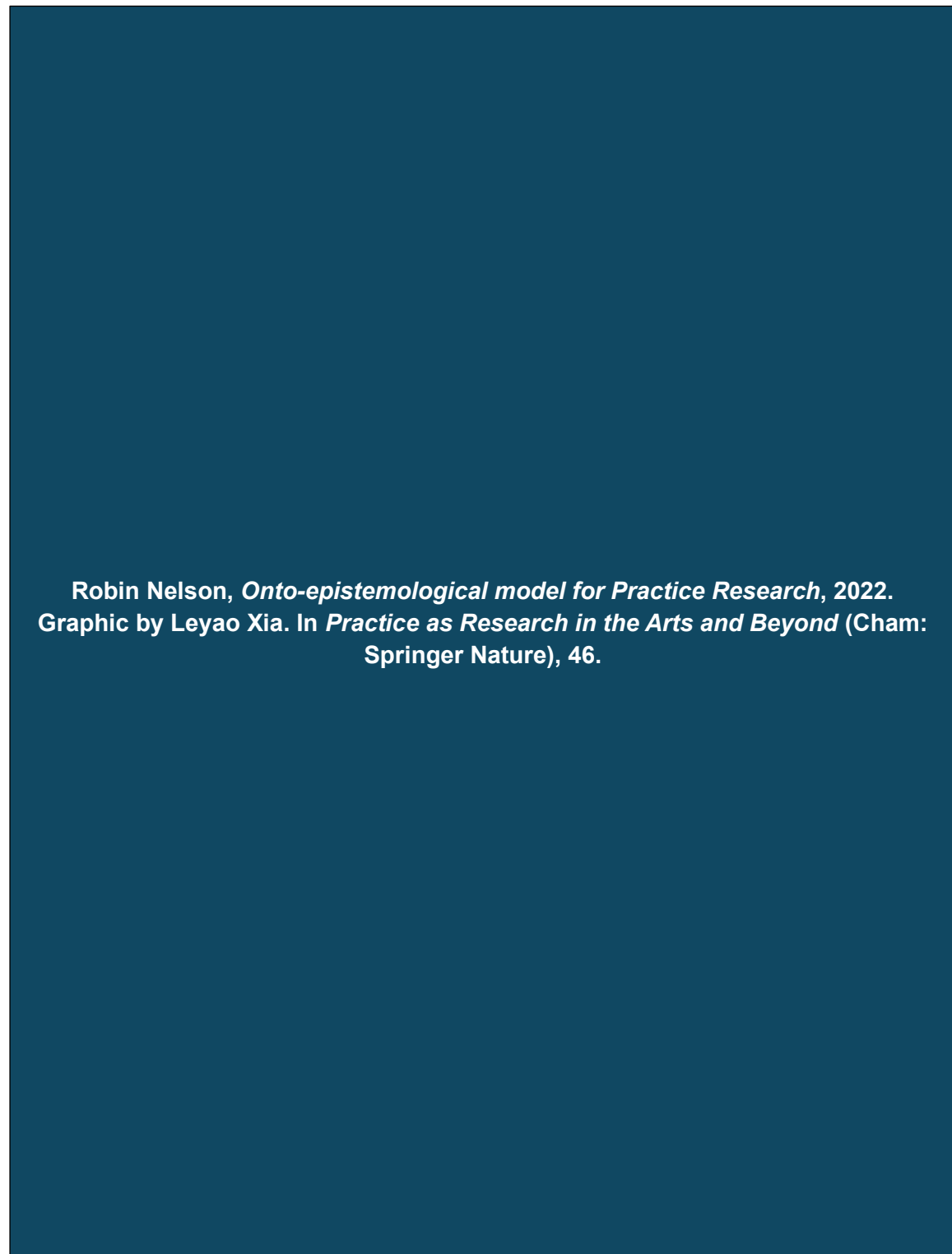


Figure 16 Robin Nelson, Onto-epistemological model for Practice Research, (Nelson 2022, 46)

Nelson refers to this image as a multi-modal model. Praxis is at the centre, surrounded by the three modes of knowing as an indication of its fundamental significance in addressing

the research questions. A reflective dialogue occurs between documented findings from external sources, referred to as 'outsider' knowledge, and insights derived from hands-on practice, known as 'insider' knowledge. It uses three modes of knowing, which he describes as an 'interplay' between 'knowing that,' 'knowing how,' and 'knowing what.' He views it as a 'dynamic dialogic process' (Nelson 2022) and illustrates this cyclical process through the arrows pointing in both directions.

Nelson's model avoids a binary segregation of research and practice as presented by researchers Linda Candy and Ernest A Edmonds. They argue that 'the research and the practice operate as interdependent and complementary processes. Moreover, research and practice are different' (Candy and Edmonds 2018, 63). Nelson's model is more in keeping with artist and theorist Barbara Bolt's assertion that there is a 'double articulation between theory and practice, whereby theory emerges from a reflexive practice at the same time that practice is informed by theory' (Bolt 2006, 4). In this way, practice is fully integrated and viewed as a form of research.

On the one hand, Bolt appears to address only two forms of knowing, a 'double articulation' that aligns with Nelson's distinction between 'know that' and 'know how.' However, she also describes the method as reflexive, which can be understood as Nelson's 'know what,' a third stage of research. This reading suggests a close affinity between the two approaches in demonstrating how practice can serve as a form of research. Of particular relevance to my work is Bolt's insight that engaging with theory through practice not only generates new understandings of the theory but also deepens comprehension of the practice itself. My methodology is grounded in this same premise.

Unlike Candy and Edmonds' distinction between practice and research, Bolt and Nelson regard practice as a form of research in itself. In other words, and in line with Cazeaux's 'metaphoricity of materials' (see literature review), it is through the process of making that observations are made and discoveries emerge. Later in this chapter, I examine the creation of the samples and I analyse the 'know-how', 'know-what', and 'know-that' that emerged from this process. Knowledge gained from the samples was then explored in the making of larger pieces, each of which investigates a specific observation identified during the creation of the samples.

Bolt views an exegesis as the means by which the 'particular situated and emergent knowledge' is generalised 'so that it enters into dialogue with existing practical and theoretical paradigms' (Bolt 2006, 12). In other words, there is an acknowledgement that specialist knowledge, such as that held by practitioners like Albers, can be used in dialogue in a broader context. In line with Bolt, Nelson argues that through his model, tacit knowledge

is made explicit. This resonates with Albers' intention for writing *On Weaving*, which Smith expresses as 'to think how "textile fundamentals and methods" could speak to other disciplines' (Smith 2013).

Bolt clearly states that writing is necessary for the dissemination of knowledge. Nelson, however, asserts that not all tacit knowledge can be expressed in words. This idea is also supported by Wilson's observations (see literature review), in which she notes that through the act of making, they were 'working from the inside of a process to understand something about time, materiality, and cultural production' (Hemmings 2012, 128). Similarly, Hillard observes that 'it is only by moving and locating oneself in certain positions' (Hemmings 2012, 47) that more can be known of her work. In short, an exegesis alone is not sufficient. While artwork can be a form of research, an exegesis is necessary for that research to be effectively communicated and disseminated. In this project, my ideas develop through a combination of practice and engagement with the documented work of others. As Bolt suggests, this can be understood as a double articulation, because this articulation also involves reflection; it aligns with Nelson's multi-modal model of practice as research.

Using Nelson's model, the generalisation of knowledge referred to by Bolt, can be seen as the means by which the 'know-how,' the particular, 'insider' knowledge, can contribute to the 'know-that' and become 'outsider' knowledge within other inquiries. In the context of my research project, Ingold's outsider knowledge of meshwork is examined through the insider knowledge gained from creating my samples. Reflections on the making of these samples – the 'know what' that Nelson refers to – are considered in relation to the outsider knowledge of Ingold's meshwork and the work of other practitioners. Ideas identified in the creation of my samples are then treated as outsider knowledge ('know that'), which is further explored through the insider practice involved in making larger pieces. These larger works are subsequently reflected upon, continuing the cycle of investigation.

Through this process, knowledge from the particular is used to explore factors that could impact the construction of an interwoven meshwork as described by Ingold. In so doing, the particular knowledge gained from practice can contribute to a broader discussion on interactions in the world. On an even larger scale, this approach could foster a wider dialogue about the potential of practice to deepen and enhance understanding. Furthermore, it could contribute to a discussion about how exploring the relevance of a practice to a theory can open up new lines of inquiry for the practice itself. In this study, it is Ingold's depiction of weaving within the meshwork, as dynamic and shaped by the interplay of its constituent lines, that suggests a view of weaving as dynamic at every stage, with the process itself regarded as the subject of the artwork.

Nelson states, 'knowledge does not arrive fully formed in neat parcels,' it comes through a process (Nelson 2022, 53). Ingold and researcher and artist Stephen Scrivener both assert that knowledge is not simply acquired through the passing of information (Ingold 2013b; Scrivener 2021), it requires engagement in an activity. Ingold specifically sees this process as a growing of knowledge (Ingold 2013b). Within Nelson's multi-modal model, the interplay of the three modes of knowing enables the tacit knowledge of the 'know-how' to become explicit and potentially contribute to the 'know-that' associated with preexisting literature and artefacts. This is made possible by pausing and thinking about what has taken place. This reflection may point to the need for additional external knowledge to be fed into the inquiry. It may also suggest additional investigations that require 'insider' knowledge – investigations conducted from the perspective of the maker.

Nelson's model is appropriate to my research because it does not specify a linear plan or blueprint. It is set up as an interactive dialogue which allows research to develop in response to what is discovered. Research as an interactive dialogue has similarities to artistic practice, particularly as discussed in the literature review, when the materials are deemed to have agency. This approach resonates with Ingold's description of artists as 'itinerant wayfarers' (Ingold 2011, 216) because of the way they are led by what they discover. He writes, 'it is in this very forward movement that the creativity of the work is to be found' (Ingold 2011, 216). Professor of Organisation Studies, Ann L Cunliffe uses Ingold's notion of wayfaring as a metaphor for how research can be conducted. She writes that wayfarers 'notice what's going on around them rather than being preoccupied with their own concerns' (Cunliffe 2018, 1434). Both artistic practice and research can therefore be viewed as improvisational and iterative, qualities that resonate with Nelson's notion of research as an interactive dialogue. Consequently, Nelson's methodology is appropriate for guiding my inquiry.

My research is grounded in knowing from previous experience, reading and encountering the work of others; my inquiry focuses on how lines behave in handweaving and not how they theoretically should behave. Consequently, I do not assume that the lines will always comply with expected norms. I am attentive to what transpires, and alert to differences. Social scientist and performance artist Stephen K Levine sees improvisation as a means of making art that 'carries a dual imperative: to provide direction at the same time be willing to give up control and follow the surprise of what is emerging' (Levine 2013, 128). A description that could equally be applied to an understanding of wayfaring. By following Nelson's model, my inquiry, like Ingold's notion of wayfaring, follows prompts and signs that become apparent as the research journey develops. Whilst guided by research questions, there exists a general sense of the direction it should take, but the actual experiences and observations cannot be predetermined.

Whilst I draw on both Bolt's and Nelson's approaches to practice, viewing them as complementary, I find Nelson's model particularly useful for understanding practice as a research methodology. As indicated in his diagram, the elements identified under the three modes of knowing help clarify how these forms of knowledge work together. By replacing the general descriptions in Nelson's framework with elements specific to my research, I provide a clear understanding of how adapting this methodological approach can generate fresh insights and address my research questions.

Nelson's model in relation to my research

As an aid to understanding how Nelson's model has been used in my research, I adapted his diagram as can be seen in figure 17.

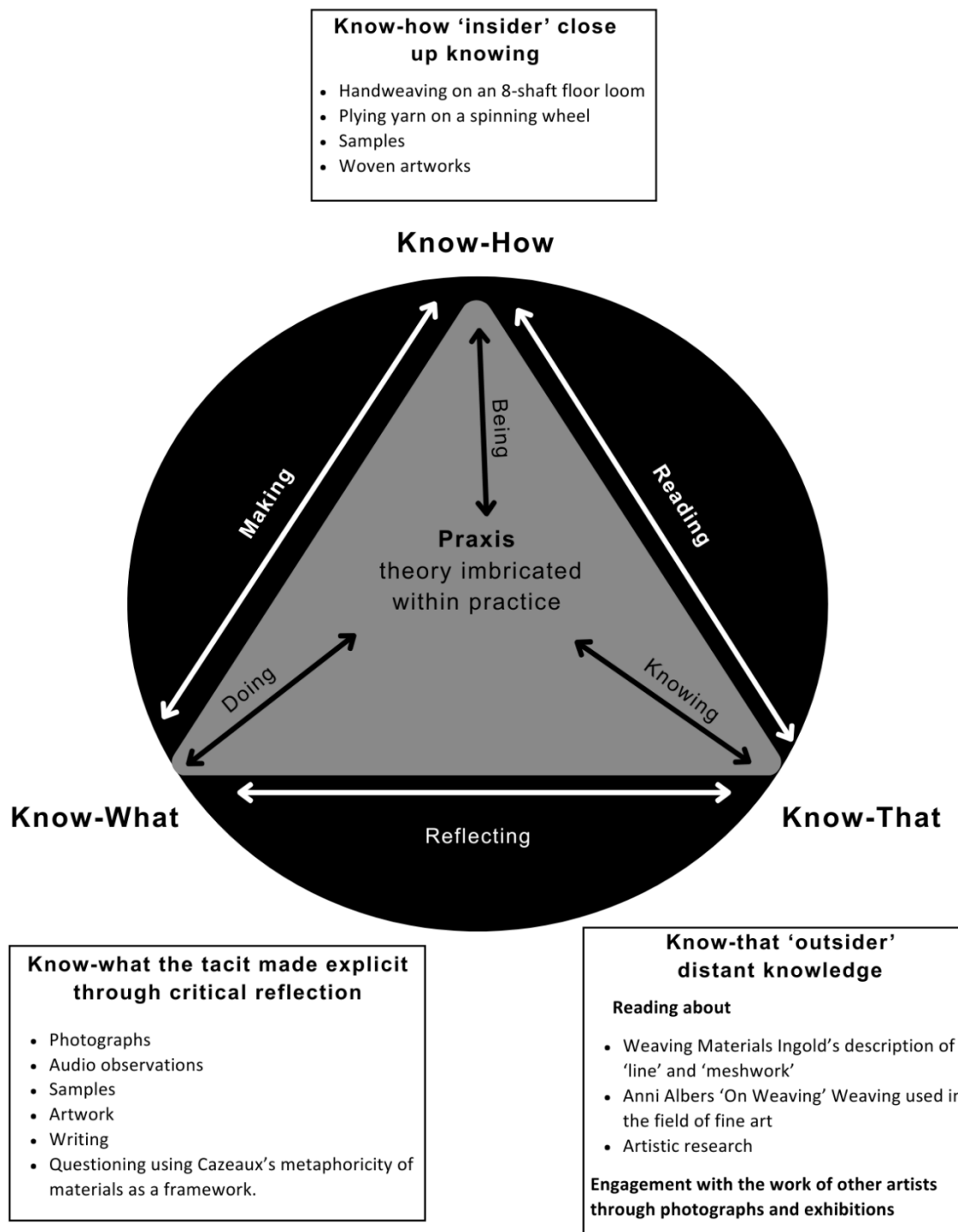


Figure 17 Nicola Moody, Adapted version of Nelson's Onto-epistemological model for Practice Research (Nelson 2022)

Know-how

In this diagram, handweaving on a floor loom and creating thicker yarn on a spinning wheel are processes that incorporate ‘know-how.’ They involve making with my hands and using my embodied and tacit knowledge. The ‘know-how’ can be understood in similar terms to ‘material productivity’ as expressed by Bolt. She deliberately uses this term to make a distinction from writer and artist Paul Carter’s use of the term ‘material thinking’ (Bolt 2006). Her emphasis is on thinking that occurs during making with materials as opposed to thinking that occurs during the articulation of what has happened. She sees the ‘intelligence of materials and processes in practice’ as ‘a mode of thought’ (Bolt 2006, 5). Like Nelson, she acknowledges that ‘knowing’ already exists prior to the articulation. As an experienced weaver, I have expertise gained by working with materials and responding to their behaviour. However, this in itself is not research. To answer how lines of yarn behave in weaving, this knowledge needs to be used in conjunction with reflection, reading and encountering other artworks. By bringing these activities together, what I know of weaving is explored through a specific focus determined by my questions, and it is this reciprocal process that is research.

In handweaving, ‘sampling’ is commonly used as a research method. Samples are created to explore ideas on a smaller scale to save time and materials (Strickler 1991; Chandler 1995; Emery 2009; Richards 2012; Smith 2014; Richards 2021; Pärson and Sundström 2021). The tradition of sampling is also a recognition that weaving offers a multitude of options as to how and what type of fabric is created. It is a way of addressing specific questions within given parameters. As researchers, Carole Gray and Julian Malins argue research ‘should be shaped in response to the characteristics and structure of the practice’ (Gray and Malins 1993, 7). Researchers Mika Hannula, Juha Suoranta, and Tere Vadén also argue that a practice methodology is apt for artistic research because it enables the artist to position themselves inside the practice and tradition in which they work. They refer to this as ‘inside-in.’ They write that the research is generated by ‘practising the practice that the research is about’ (Hannula, Suoranta, and Vadén 2014, 23). Given the centrality of practice in this study, sampling is an appropriate starting point for interrogating the theoretical applications of weaving.

Weavers Åsa Pärson and Amica Sundström describe weave samples as ‘sketches at the loom’ (Pärson and Sundström 2021, 164). Richards describes the process of creating samples as a conversation between the materials and the maker (Richards 2012, 140). She writes that ‘sampling is potentially the most exciting part of making textiles, because it is when you are most often discovering new things and pushing ideas forward’ (Richards 2012, 168). To avoid drawing on preconceived ideas about what should happen or what I, as the weaver, wanted to happen, I use sampling. As discussed, I specifically draw on Cazeaux’s

‘metaphoricity of materials’ (Cazeaux 2017, 100) because he presents a clear framework to direct my observations during the process of making. In this way, my findings are rooted in direct experience or what Albers refers to as ‘evident facts.’

Know- what

The ‘know-what’ on the diagram I adapted in figure 18, incorporates informed reflection that takes place during and after the weaving process. Photographs are taken and an audio is created that records thoughts, ideas and observations. These reflections are also used in conjunction with the completed products. In this inquiry, writing acts as an additional form of reflection. Linguist Charles Forceville makes a distinction between writing and art, stating that the latter has a ‘perceptual immediacy that is lacking in language’ (Forceville 2008, 463). The multi-sensory experience of making enables several things to be observed at the same time. In handweaving, these observations are commonly experienced through touch and sight (Smith 2014). The process of writing requires these observations to be ordered. However, it should be noted that not everything that has been observed is relevant to this inquiry. The process of writing acts to identify and define what is pertinent.

Cazeaux sees the process of writing and the process of making art as a means of shaping and structuring an experience (Cazeaux 2017, 78). He uses the term ‘chunking’ to describe how art and writing can break up an experience into manageable ‘chunks’ and draw attention to what stands out. In the context of Nelson’s model, the ‘outsider’ knowledge of the ‘know-that,’ can be used to chunk the experience of ‘know-how.’ In other words, it focuses attention on a particular element of the inquiry. My investigation uses Ingold’s description of line to chunk the experience of handweaving. The samples I have made explore the behaviour of lines of thread. Through a process of reflection, findings from making become part of the ‘know-what.’ Lines of yarn behave in several distinct ways within the samples. The creation of artworks informed by knowledge gained through sampling can also be seen as a form of ‘chunking.’ Each artwork emphasises a particular aspect, directing attention to one of the specific ways in which lines can exhibit different behaviours in handweaving.

These reflections occur through the use of Cazeaux’s ‘metaphoricity of materials’ as a framework for asking and answering specific questions about the behaviour of lines in the woven samples. The overarching question of how lines behave in weaving is broken down into more specific questions. Firstly, what can be known about the lines because of my manipulation? Secondly, what can be known about the lines through their interactions with each other? Thirdly, what could be known about the lines from the way they impact my behaviour as the weaver? This reflection continues in the asking of similar questions in the creation of subsequent artworks. Although variations in behaviour will arise from differences

in the materiality of the lines, the aim is to identify recurring patterns or principles that contribute to a broader understanding of the meshwork.

The fourth area of focus involves questioning how the materials of the artwork might connect with what is represented in the work and thus impact how it is understood. Cazeaux writes that representation does not refer to 'imitation or isomorphism' but 'a kind of notation or framework that refers to and stimulates our appreciation of the subject' (Cazeaux 2017, 98). In *Traces* by Hillard, for example, the gradual separation of materials and the distortion of imagery establishes a connection between the behaviour of the materials and the erosion of memory. In this study, I similarly question the relationship between materials and subject matter. While the subject matter of the artworks may be seen to relate to Ingold's meshwork, the artworks are not direct representations or illustrations of it. Instead, Ingold's presentation of lines in the meshwork serves as the lens through which I create work.

My research investigates how the interaction of lines affects the structure of the woven piece and how these behaviours continue to impact its form after it is removed from the loom. The subject matter of the work is not Ingold's meshwork, but rather the behaviour of lines in the weaving. The work has also been made because of the behaviour of lines in the weaving. Jelinek writes, 'an artwork works in the realisation of the concept, in the successful interplay between form (how it's made) and content (what it's about)' (Jelinek 2020, 128). In the works created for this study, the form and content have become the same thing.

Using the fourth area of focus from Cazeaux's 'metaphoricity of materials,' my research explores weaving not as distinct from its fundamental element, the line, but as the very interaction of lines. In the process of creating these artworks, the three earlier questions derived from Cazeaux's framework are asked again. The 'know-how' of handweaving is examined through the 'know-what' of reflective practice, informed by Cazeaux's theory. This cyclical process leads to the creation of artworks that aim to contribute a 'know-that' to the field of fine art.

Know-that

As shown in the diagram, the 'know that' of this research is my engagement with artworks, both through photographs and in exhibition settings, as well as through reading the work of others. The primary material that forms the bedrock of this study includes the writing of Albers in *On Weaving*, Ingold's work on the construction of his meshwork, and the artworks of Wilson, Hamilton, Tanaka, Hillard, Albers, and Hicks. In addition, I draw on a range of secondary sources that support and contextualise my research. These include Cazeaux's concept of the 'metaphoricity of materials', Nelson's model of 'practice as research', the writings of Clarke and Jelinek on knowledge generated through art, the work of Bunn, Ingold,

and Bolt on the relationship between making and understanding, Smith's interpretation of *On Weaving*, and the writings of weavers such as Richards and Emery.

These materials provide insight into how weaving is conducted and how it can be used in dialogue with other disciplines. My exploration of how weaving is used in the field of fine art involved studying specific examples and reflecting on them in light of Albers' assertions. This includes reading artists' comments on their work and the thoughts of curators and critics. It was necessary to explore Ingold's description of 'line' and his explanation of the concept of meshwork. Alongside this, I have also explored how artists and researchers such as Clarke and Jelinek understand the potential of art to contribute to broader disciplinary conversations.

I have not followed a linear order in which I engage with all this 'outsider' knowledge prior to engaging in the practice, before considering through reflexivity what has been learnt. It has, been a circular model. Like a circle, it is hard to state where research begins. Although I could state that I started by reading about the meshwork and reflecting on how this relates to my practice. My reading of Ingold was informed by my prior knowledge of lines of yarn in weaving. Experimenting with lines of yarn in my practice in light of what I had read of Ingold also prompted additional reading of Albers and other works by other artists, which prompted additional experiments on the loom. Using Nelson's terminology, my research was conducted out of a 'dynamic dialogic process' (Nelson 2022). This is a toing and froing, perhaps akin to wayfaring in a spiral formation. I return to a similar area but view or approach it differently because of reflection on where I have already travelled.

Alternative approaches

Other methodological approaches could have been used that still centre practice. Gray and Malins discuss five methodologies that artists have found productive: naturalist inquiry, 'bricoleur,' action research, soft systems and inquiry by design (Gray and Malins 2004). A naturalist inquiry has many of the aspects of Nelson's multi-modal model, however, there is a particular emphasis on the location in which research is conducted. While studio research is seen as a suitable location – a lot of my work is conducted in my studio – the physical context of the investigation does not concern me. This is because it does not have an impact on the behaviour of the lines of yarn.

The bricoleur approach uses mixed methods. It is often thought of as improvisational because the notion of a 'bricoleur' is someone who solves problems by making use of the tools that are at hand. Whilst my research is improvisational in that I allow my observations to guide and prompt my decisions, it is conducted out of the specific activity of handweaving. Although I do use different handweaving techniques and combine making, reading and

reflecting I have selected these methods because of their appropriateness to my research questions, which are situated in the relationship between a theoretical use of weaving and the practice of weaving. My methods are rooted in a handweaving practice. It is knowledge generated through these methods that explores and is explored through theory.

Incorporating other methods could make my findings less specific.

Action research is an appropriate methodology when the research is specific to a location or setting. It often involves collaborating with participants and people impacted by the location. Like Nelson's model, it also incorporates reflexivity. My investigation, however, is not tied to an actual situation or setting so this model is not relevant to my research.

A soft systems methodology is used as a means of understanding the whole in terms of its parts. Exploring how something exists, works or operates by exploring how the different parts integrate. It is often used to explore human-centred problems and derives its name 'soft' from the absence of easily defined classifications caused by variations in values, opinions, and beliefs. The focus of my research is on the behaviour of the lines which could be referred to as parts. Although they do create a structure this is viewed as a by-product of their relations, not their aim. A soft systems approach would run counter to the concepts that my research is exploring.

Although an inquiry by design methodology shares similarities with practice-based methods, it is not the most appropriate approach for my research. My research aligns more closely with the approaches proposed by Bolt and Nelson, in which practice is used as a space for observation, reflection, and the generation of understanding. While inquiry by design also values knowledge that emerges through creative processes, it tends to emphasise the design process itself as the main structure for investigation. My research does not aim to produce specific interventions or outcomes, but rather to draw attention to how lines behave in weaving and how these behaviours influence our understanding of the meshwork. Additionally, it explores how reflecting on the making process, in relation to other forms of knowledge, can generate new insights that can be explored further in fine art.

In addition to these 5 methodologies, auto-ethnography is also used within artistic research (Pace 2012). Auto-ethnography combines ethnography and autobiography as a research methodology. It uses reflections on the self as a means to understand the wider context of human experience. This resonates for me because I have the dual role of researcher and maker. I am generating the artworks that are the focus of this inquiry, and my actions and reflections influence what is shown in this research. However, the focus of my investigation is on the behaviour of lines of yarn in handweaving, it is not on understanding my behaviour as a practitioner.

Samples

In this section of my methodology, I explain why the creation of weave samples is a necessary and appropriate method to address my research questions. I identify the parameters that were established for the creation of the samples and why these were chosen. I then explore, using Cazeaux's 'metaphoricity of materials' (Cazeaux 2017, 100) as a framework, the insights these samples offer to an understanding of lines in handweaving. Reflections on these observations are used to identify the influential factors on the behaviour of the lines of yarn within the weaving. The intention is to explore these factors further through the creation of woven artworks which are discussed in subsequent chapters. This section is specifically concerned with the rationale for creating the samples, an additional chapter will explore knowledge gained from *Samples*, an artwork created from the samples.

To gain an understanding of how lines of yarn behave in handweaving, direct observations need to be made within a given context. The samples, in this context, become evidence of how the lines behave and negate inaccurate assumptions being made based on prior knowledge of weaving created for a different purpose within a different context. Sampling is encouraged as a design tool for weavers; it enables comparisons to be made.⁴ Sampling is a recognition that there are multiple options available to a weaver, including the choice of colour, structure and material.

In her essay 'Designing as visual organisation', Albers explores how decisions about colour, material and structure are made to serve the purpose of the work. She refers to this as 'controlled formulation' (Albers et al. 2017, 54). To elaborate on how choices are made Albers uses the example of a weaver commissioned to create a 'wall covering material' for a museum. She states that the wall covering needs to be:

dust-repellent, nonfading, woven sufficiently closely to cover over cover up any irregularities of the wall, and, for the same purpose having a certain amount of bulk. Furthermore, it should neither stretch nor sag, and it should be possible to clean it by brushing or wiping. Also, any small nail holes driven into it should close easily after removal of the nail. It should, in all possibility be light in colour, perhaps even light-reflecting, possibly flame-retarding, and certainly mothproof if not mildewproof. In regard to general complexity: it should be quiet enough so as not to compete with any artwork put on it or placed before it – that is, it should be subservient, not dominating (Albers et al. 2017, 55-56).

⁴ This point is made by numerous authors on weaving (Chandler 1995; Richards 2012; 2021; Pärson and Sundström 2021; Briand 2023).

Within this context, she poses questions and explains her rationale for her material, structure and colour choice. She refers to this process as 'considered relationships' (Albers et al. 2017, 62). Albers argues that designers and artists both work in this way and exemplifies this idea by using a quotation from painter Lyonel Feininger in which he states that one of his paintings 'painted itself' (Albers et al. 2017, 61). The needs of Feininger's painting and the needs of the wall covering determined the choice of materials and the method of making.

It is likely that to create Albers' given example of a wall hanging for a museum, samples would have been created to help answer the questions that she identifies. The wall covering suggested by Albers was for a particular purpose and location; its requirements were already established. Samples could have been created to refine how best to fulfil the given criteria. In my research, my primary concern has not been the visual aesthetic, rather, I made choices about the colour, structure and material to enable the focus to be on comparisons between the behaviour of lines. These samples are the starting point; they are the source of information that governs the criteria for subsequent artwork.

Parameters

Artistic research often takes place within traditions appropriate to the art form (Gray and Malins 1993). The size of woven samples is commonly around 8 inches by 8 inches. This is deemed to be the optimum size for making judgements about the relationship between colour, structure and materials without using unnecessary amounts of material and time. Sampling is traditionally viewed as a means to an end, to answer questions, a necessary stage in the design process akin to sketches on paper (Pärson and Sundström 2021). Weaver and teacher Deborah Chandler states that 'a sample doesn't need to be a "thing;" it is a learning device. If you have set out to learn something and you do, then the piece has fulfilled its function' (Chandler 1995, 23). The lengths of the warp used in each of my samples was sufficient to ensure that each sample was approximately 8 inches in length allowing an approximate 2-inch gap between each sample. Nine samples were generated from the same warp which consisted of 3 weave structures explored with 3 different yarn weights.

Material

My rationale for selecting mercerised cotton yarn for the samples and five subsequent artworks is discussed in the 'Material Choice' section in the appendix. There, I observe how different types of materials behave during the weaving process and use these insights to determine which yarn best supports the aims of my research. In short, I needed a yarn that provided clear observations of the behaviour of lines. I avoided yarns that were too fibrous and thereby make it harder to identify the edge of the yarn within the weaving. The yarn also

needed to be strong enough to behave as warp and weft and not easily break because of tension and abrasion. It also needed to be available in different colours and weights. Additional considerations such as whether a yarn is hard-wearing and shrinks when washed, can be influential factors when choosing a yarn, but these were not relevant to the aim of my research.

By selecting a specific yarn, knowledge gained through the samples relates to this material. Conducting additional experiments with other materials could yield additional knowledge on the behaviour of lines in weaving. My research is conducted to interrogate Ingold's meshwork through an analysis of the behaviour of lines in weaving. It recognises that additional experiments with additional yarn could further enhance the understanding that is generated through this study. Differences in the behaviour of lines in weaving due to their materiality are further explored in the creation of *Materials*, an artwork discussed in detail in Chapter 9.

'Material' used in the context of mercerised cotton refers to cotton fibres that have been washed in a particular way. Not all mercerised cotton will behave the same way; its materiality is also impacted by the processes that it has been through. To limit these variations and allow for more comparisons of how the amount of material impacts its behaviour, I have selected to use 2-ply yarns, 30/2 ne and 8/2 ne. Here, the first number refers to the number of 840 yards that have been spun from a pound. The 2 in this instance refers to the 2 plies, ne is short for 'number english', a specific method of counting yarn.⁵ The fibres in these yarns have been through the same process, but fewer fibres are used to create a length of 30/2 ne yarn, resulting in a finer yarn. Using yarns of different weights allows observations of how the amount of fibre impacts the behaviour of the line. Combining the different weights of yarns as warp and weft can also allow for an exploration of the impact of this relationship on the behaviour of these lines. Alongside these experiments, I plied 3 strands of 8/2 ne together. This yarn was thicker, and it contained additional twists. It was composed of the same material as the other lines but the 3 x 8/2 ne lines of yarn had undergone an additional process. Samples created with this yarn drew attention to how the processes fibres have undergone prior to weaving can impact their behaviour in the weaving.

⁵ Other methods of counting yarn exist such as nm (metric count). Different ratios of weight and length are used to calculate the count which in turn is used to gain an understanding of the thickness of the yarn.

Structure

Having established the rationale behind material selection, I now turn to the role that weave structure plays in influencing line behaviour. There are many different weave structures; the larger the number of shafts on a loom the more possibilities. These variations depend on which warp threads are lifted in which order to create a shed, the opening through which the weft threads pass. Despite the quantity of options, these weave structures can largely be classified into three main structures: plain, twill and satin. Each structure is traditionally used for different purposes. Plain weave is deemed to be the strongest because of the frequency of interactions between warp and weft. The weft passes under and over alternate warp threads. Twill fabric is frequently used in the creation of clothing; its diagonal pattern allows it to be moved easily in different directions. Satin is used to create a soft fabric. The weft threads float over several warp threads, giving rise to a fabric with distinctly different surfaces. It is often used to create decorative, luxurious cloth.

To create the samples I selected plain, twill and satin weaves that used the same threading up. 'Threading up' refers to the process of putting yarn through the heddles. The order in which they are threaded up will impact the pattern that is created in the fabric. I have an eight-shaft loom, the threads passed through consecutive heddles from shafts 1-8. Heddles are made of cord or metal rods with an opening 'eye' in the middle. The warp threads are threaded through the eyes. The heddles are attached to different shafts and are all lifted to create a shed. What changed was which shafts were attached to the treadles (treadles are the pedals operated by feet on a floor loom that determine which shafts are raised). This in turn, impacted which shafts were lifted and the subsequent pattern created. By using the same threading up and simply altering the treadling, I was able to reduce the amount of yarn wastage. The purpose of the samples was not to compare different types of twill, or different types of satin, but to compare the behaviour of lines within the three weave structures. Additional comparisons were made between the different yarn weights and the combining of different yarn weights within these weave structures.

A weave structure is also impacted by how densely the yarn is packed together in a weaving. Alterations in the EPI (ends per inch) – the number of lines of threads that can sit side by side in an inch – and the yarn weight change the density. To allow for a consistency of approach and to enable relevant comparisons to be made, all the samples had an EPI that corresponded to a balanced weave. A balanced weave refers to a weave structure in which there are the same number of warp and weft threads within a given measurement. In other words, the number of warp threads that fit into an inch when laid side by side was halved; the thicker the yarn, the smaller the EPI. The EPI was maintained throughout the fabric

through the use of a reed that had an appropriate number of dents (the spaces created by the reed) to correspond with the required EPI. This approach enabled comparisons to be made between the behaviour of lines of different weights. Additional comparisons could also be made between the behaviour of thicker lines of yarn in conjunction with finer lines of yarn as warp and vice versa.

Colour

Colour is usually a significant part of fabric design. The same material and structure can look very different according to the colour choices. However, if it is only the colour that is different, the feel and behaviour of the fabric will remain the same. My research is not concerned with creating a specific visual effect. It does, however, use yarns of different colours as a means of visually perceiving the behaviour of distinct lines, to help answer my research questions. Coloured lines of yarn were, therefore, incorporated into each sample. Seven coloured lines of warp were used across each sample to enable the behaviour of these lines to stand out. A black warp thread was used at each selvedge (the edge of the fabric, the section where the weft thread bends and returns across the warp threads); additional black threads were used at approximately 1 inch and 2 inches in from the left-hand selvedge. Red, black and grey warp threads were also used side by side, approximately 4 inches in from the left-hand side. Placing these lines at different points across each sample also drew attention to differences in the behaviour of threads in different locations. For the same reason, a black weft thread passed from left to right and back again after approximately 2.5 inches of weaving. This was followed by three-quarters of an inch of alternate black and white weft threads approximately 4 inches in from the start of the weaving.

Findings from the samples (know-how)

The following section presents findings generated through the creation of my samples. These findings have been identified through the application of Cazeaux's concept of the 'metaphoricity of materials' as a guiding framework. This approach has led me to focus on key areas for observing material behaviour, reflecting on the reasons behind variations in that behaviour, and analysing the resulting impact on the final creations.

My samples have been created based on the idea that new insights can be gained by being attentive to how the mercerised cotton yarn behaves in the process of handweaving. As an experienced weaver, I can anticipate how lines of yarn are likely to behave within the samples. What I was attentive to was anything that stood out, any line or groups of lines that did not conform, whether that be weft, warp or both. Any observations I made were documented using photography to make comparisons with different parts of the process. I also kept an audio record. This enabled me to record my observations and reflect on why

things had occurred whilst still engaging directly with the materials and the process of weaving. The photographs, the audio and the outcomes were used alongside each other. Although some of the behaviours of lines could be seen in the final product, not all that had transpired can be visually perceived. In the writing-up process, I questioned what these observations could offer to an understanding of lines in Ingold's meshwork and how weaving could be perceived not as an object but as the ongoing interaction of distinct lines of yarn.

How do the lines of yarn behave because of artistic interactions?

Whilst making the samples, three things became apparent in my interactions with the lines of yarn. Firstly, the behaviour of the yarn changed according to its role. Secondly, the behaviour of the yarn changed according to where it was in the process of weaving. Thirdly, where the yarn was located within the weave impacted its behaviour.

Behaviours change according to their role.

Mercerised cotton yarn was used as both warp and weft. Different demands were put on the yarn according to its role. When it was used as warp, tension was necessary. It was no longer slack, loopy and loose, it became straight and taut as it was tied onto the front and back beams. Beams are the horizontal sections of the loom around which the warp passes.⁶ Through this process, the lines of yarn displayed different properties. This was particularly pronounced in the creation of satin weaves. This weave structure has two distinct surfaces: one is warp-facing, shown in figure 18, and the other weft-facing, shown in figure 19. The two photographs show different sides of the same fabric.

⁶ The warp beam specifically refers to the bar at the back of the loom that the warp threads are wound onto. The cloth beam refers to the bar at the front of the loom onto which the fabric is wound.



Figure 18 Nicola Moody, Sample 6 warp-facing side, 2023



Figure 19 Nicola Moody, Sample 6 weft-facing side, 2023

There is a distinct difference between the feel of the warp-facing side and the weft-facing side. In this particular structure, one in every eight warp threads was raised to create the shed. This was sufficient for the weft yarn to hold the warp lines together. On the warp-facing side, the lines that had been pulled taut and straight were dominant. The tension that had been applied compressed the fibres within the yarn, causing the edges of the yarn to become pronounced. This meant a greater distinction could be felt between the lines of yarn, which created a rougher texture.

On the weft-facing side, the lines had been beaten to lie side by side. They lacked the tension applied to the warp threads, which meant the fibres were less compressed within the yarn. The weft lines had more flexibility – the fibres had more space, which generated a softer surface. This is shown in figure 19, where it is difficult to detect the coloured lines of warp thread. In these examples, all the lines were composed from the same material that had been through the same processes, with the exception of the dye in some of the lines. There are, however, two reasons why these lines behave differently: one, their materiality, and two, the processes to which I, as the weaver, subjected them.

In addition to the properties displayed when yarns were used for different roles, differences also occurred within a given role. This was particularly the case for warp threads held under tension, as the tension is similar but not identical. Tension is judged by touch. The weaver lays their hand across the warp threads. The amount to which the warp threads can be depressed causes the weaver to make a judgement about the evenness of the tension. The lines are judged collectively in groups associated with the size of the weaver's hand. In their project 'Knowledge in action in weaving,' researchers Berggren Torell and Ranglin wrote that the weavers used the flat of their hands to 'sense the strain of the warp several times during the work process either with a bouncing or with a caressing movement under the threads' (Berggren Torell and Ranglin 2014). The weaver can also observe differences in tension. For example, any yarns that are perceived to be thicker or slacker could indicate a lack of tension, suggesting that these yarns have not been pulled as tightly as the others.

Differences in tension can occur, for example, through the combining of yarns in knots necessary to attach the yarn to the front or back beam. Some lines of yarn could be caught up in a tighter part of the knot. Additional movement within the knot during the weaving process can also lead to slight alterations in tension. The type of loom used can make it easier to identify and maintain even tension. When the whole warp is visible on the loom, it is easier to make necessary adjustments as is the case with a frame loom an example of one is illustrated in figure 20.

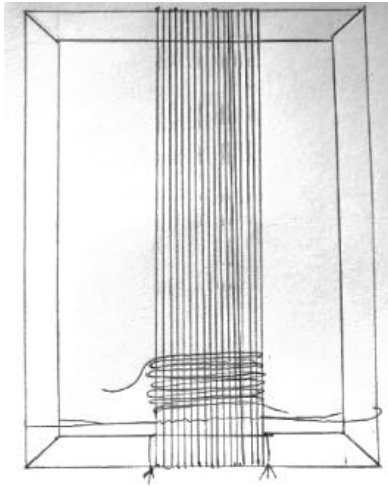


Figure 20 Nicola Moody, drawn illustration of a frame loom, 2024.

When a warp is wound onto the back beam, as is the case with shaft looms (figure 21), there is more opportunity for variations in tension to occur. Yarns that are wound on may rest on different lines of yarn with every turn. Slight variations across a larger length of warp can cause significant differences in tension. During the creation of sample 18, inconsistent tension led to the creation of a series of small loops forming along a warp thread. This can be seen in figure 22, which shows the sample on the loom and figure 23, which shows the sample when off the loom.

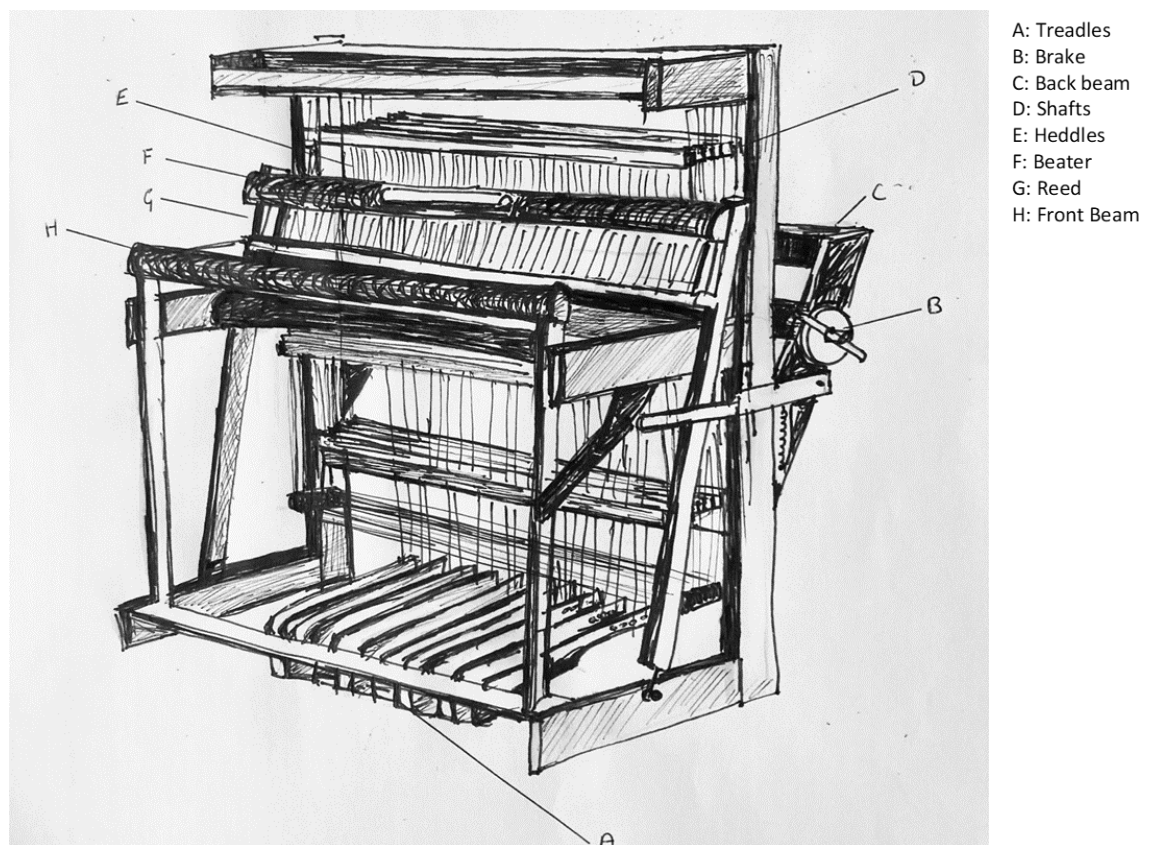


Figure 21 Nicola Moody, drawn illustration of 8 shaft weaving loom, 2023



Figure 22 Nicola Moody, Sample 18, detail, in process, 2023

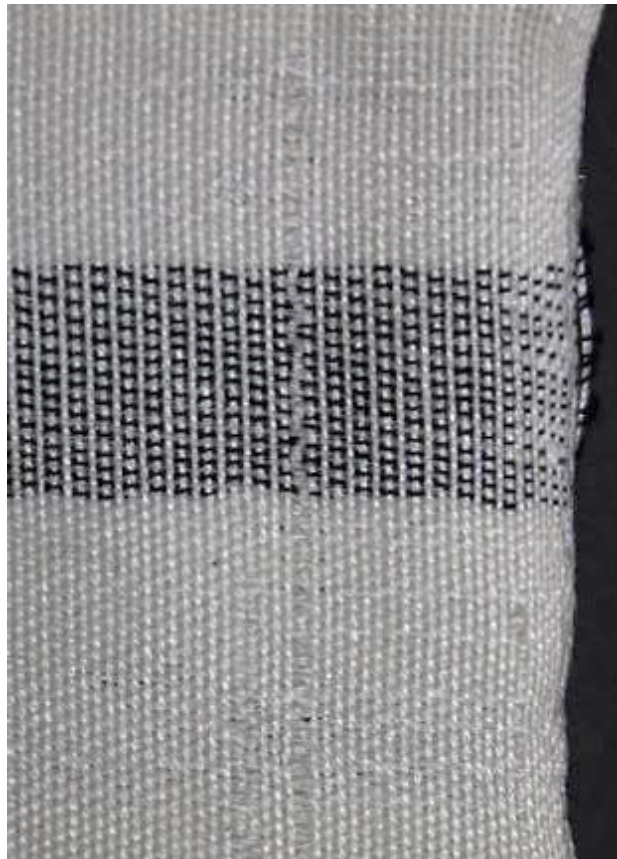


Figure 23 Nicola Moody, Sample 18, detail, in process, 2023

This line of warp behaved differently from other lines. The excess slack in this line of warp became apparent as the weaving grew. The raising of the shafts causes the warp yarn to move, the tension of most warp threads means that despite this movement, they maintain their position. The additional slack in one of the warp lines meant that as the weft thread moved through the shed, more warp thread was scooped up. As the weaving continued, more loops were formed, and the slack of this line of yarn was absorbed into the weaving. The weaving continued and although this warp was 'natural' in colour the undulations formed in this warp produced a distinct texture. This texture was visually perceived because of the additional tone and shadows, contrasting with the surrounding straight lines of warp.

In the creation of sample 19, slackness in the warp threads was manifest in the weaving through the generation of larger gaps around the slacker warp, shown in figure 24. The warp had moved within the weaving structure and was noticeable because of the way three lines behaved differently from the other lines. Two lines with wider gaps stood out among the surrounding rhythmic even spacing of the rest of the plain weave structure. The slack warps gravitated together within the structure. They followed the same under-over pattern, but this area of slacker yarns could cause this section of fabric to be weaker.

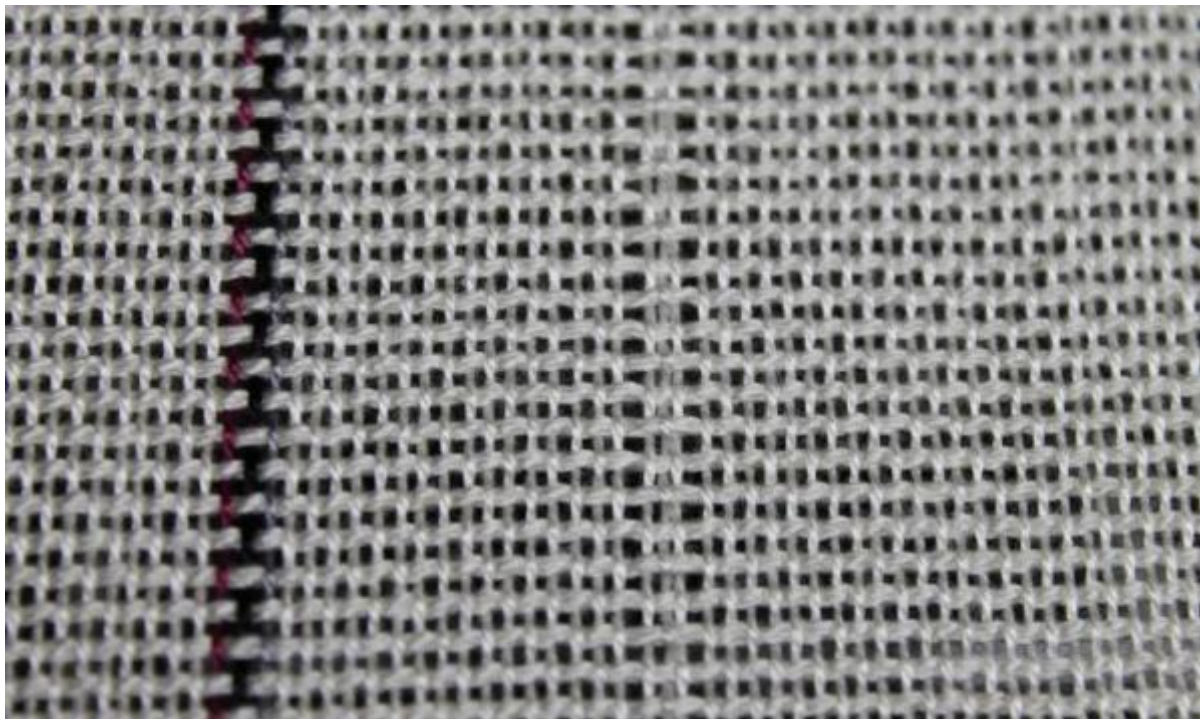


Figure 24 Nicola Moody, Sample 19, detail, in process, 2023

Behaviours change according to the stage of the process

The weaving process involves pushing and pulling. Yarn is pulled through a shed or pulled onto a beam. Yarn is also pushed down; the pressure of the beater is cumulative as additional weft threads are added. The lines of yarn behave differently at different stages.

For example, lines of weft that pass through a shed are fairly loose. This line becomes straighter and constrained when the slack of the yarn is taken up through the changing of the shed and the beating process. The line moves up and over different warp threads. This transition can be seen in figure 25.

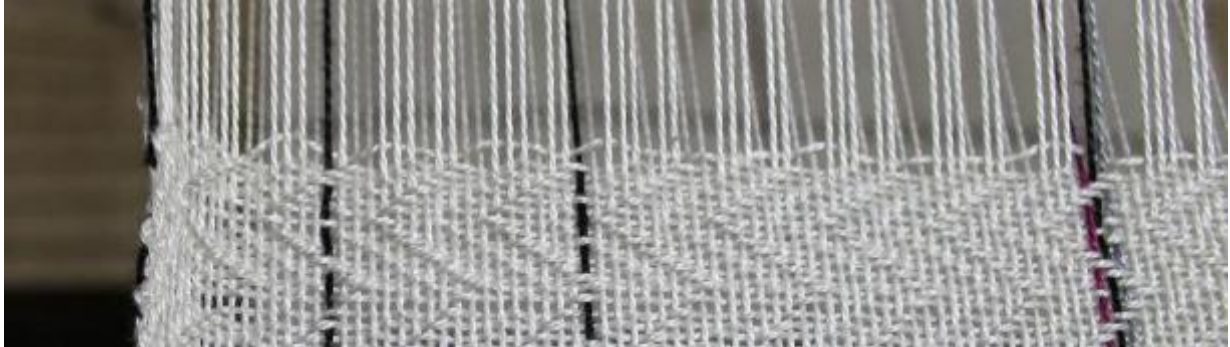


Figure 25 Nicola Moody, Sample 5, detail, in process, 2023

Lines of yarn involved in weaving also behave differently when off the loom. The release of tension of the warp threads enables some of the lines to readjust. Figure 26 shows fabric on the loom and figure 27 shows the same sample off the loom. Figure 26 shows a distinct curve as the weft threads move across the warp. This is made clearer using black weft threads. Where the curve rises suggests that these warp threads are held under greater tension. When the weaving is wound on, differences in the tension cause some of the warp yarns to move more than others which impacts the position of the lines of weft.



Figure 26 Nicola Moody, Sample 3, detail, in process, 2023

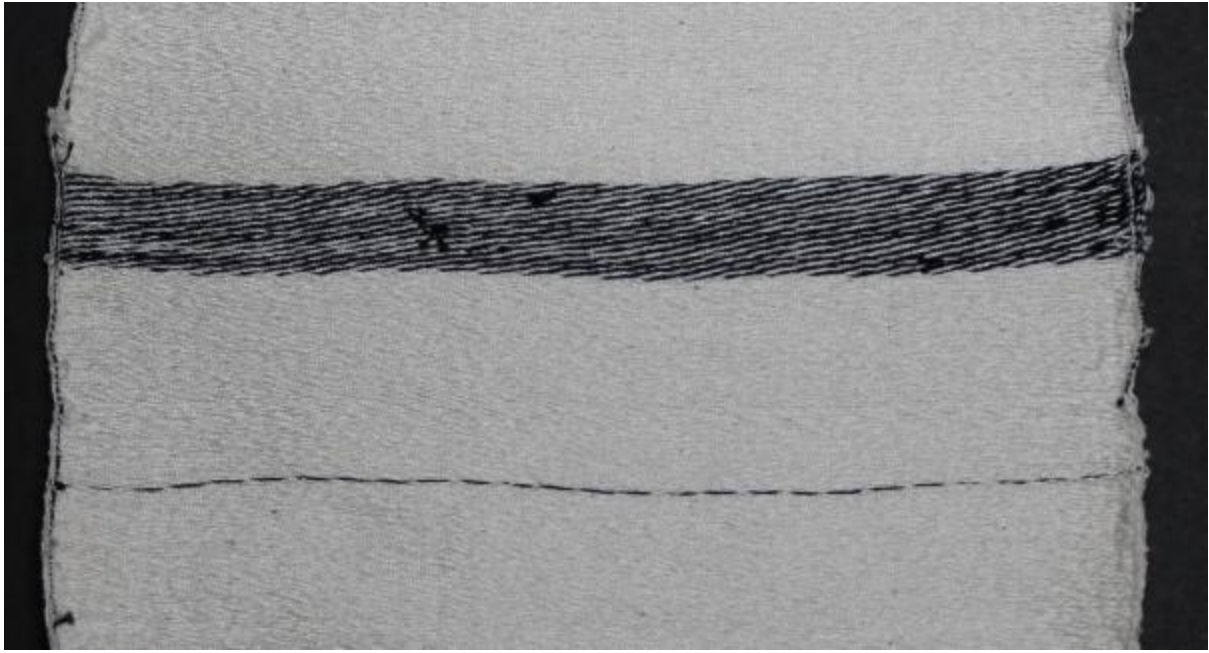


Figure 27 Nicola Moody, Sample 3, detail, off the loom, 2023

Figure 27 shows the work when it is off the loom. The tension has been released and although there is still a slight curve, this is much less pronounced. Through use, the lines within the fabric may readjust, further mitigating these differences. As the fibres within the lines of warp are more relaxed the warp threads have less impact on the behaviour of the weft. The lines that had generated the curving of the weft behave more in line with the other warps and the differences imposed on the weft are less evident.

The stages of the weaving process can also change according to the pattern or weave structure that is selected. What lines are involved and when is determined by the order in which warp threads are raised and weft threads introduced to the weaving. Different weave structures can impact the frequency with which warp and weft lines are incorporated into the weave. This is most noticeable at the selvedge. Figure 28 shows an outer line of warp, it is infrequently incorporated into the weave, which means it is potentially more exposed and vulnerable to coming out of the weaving.



Figure 28 Nicola Moody, Sample 9, detail, in process, 2023

When the pattern also involves different weft threads the order in which they are used can impact the structure. Figure 29 shows a section of weaving in which the use of two different weft threads resulted in the outer warp threads not being incorporated into the weaving. To ensure that this line is not left out, the weaver will need to make specific interventions.

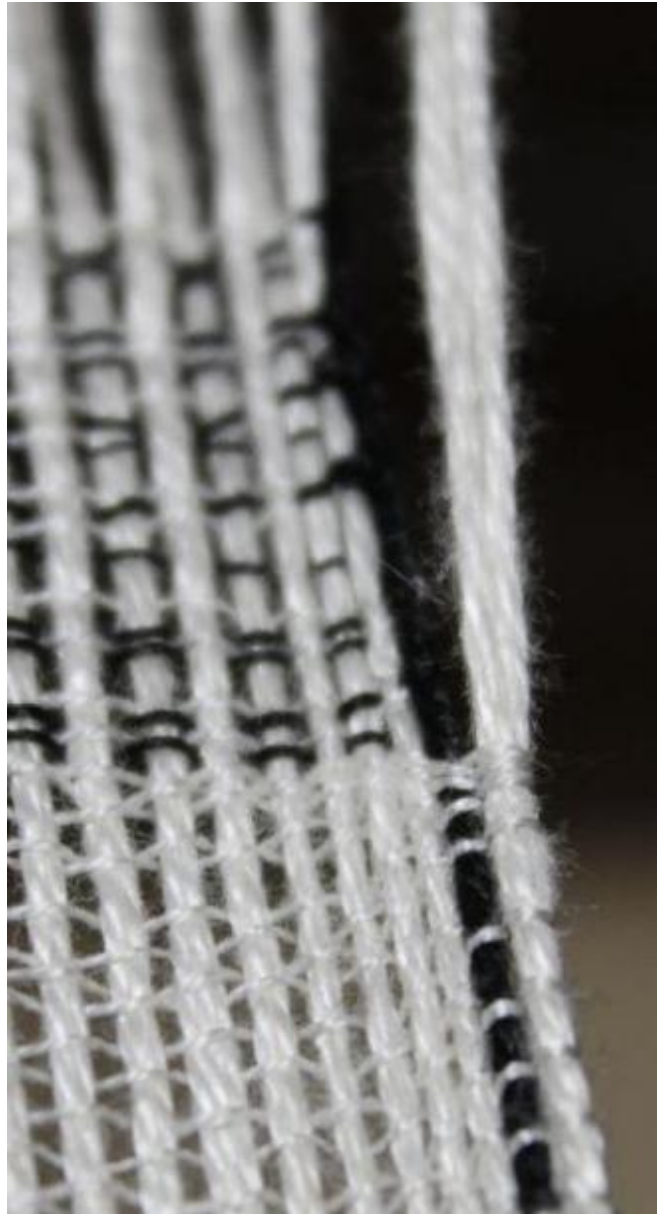


Figure 29 Nicola Moody, Sample 13, detail, in process, 2023

Behaviours change according to their location in the weave.

In addition to changes that occur at different stages of the process of weaving, there are also changes that occur according to where the line is located within the weaving. This is particularly the case at the selvedge. The returning weft loops around the last warp line and moves back through a new shed - in most cases, this causes the lines at the selvedge to be pulled in. This is demonstrated in the samples and is clearly illustrated by comparing the measurement of lines that run through the reed with the width of the fabric. The latter is much narrower, as shown in figure 30.

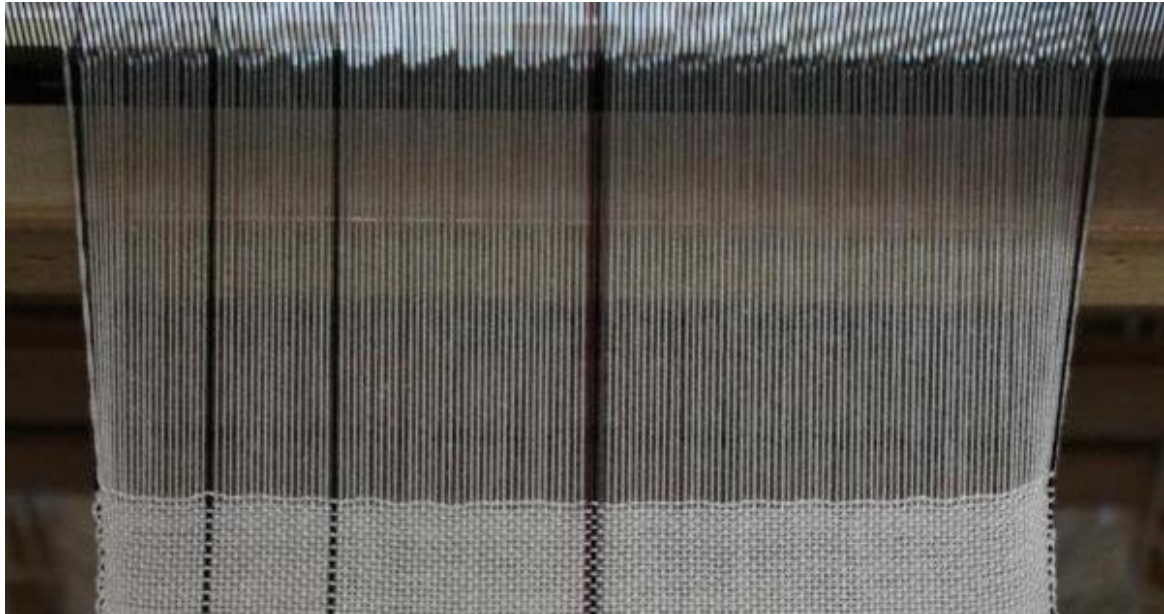


Figure 30 Nicola Moody, Sample 10, detail, in process, 2023

As the warp threads move inwards at the selvedge, the structure of the weave is impacted. This section of weaving became denser and more rigid, as shown in figure 31. In this example, the chevron pattern of the twill weave became more compacted at the selvedge. Figure 32 also shows in an additional sample how the weft threads had to curve as there was less room for them. Consequently, the section of fabric grew at a faster rate than the rest of the weaving. It was denser and stiffer. The spacing of the warp threads was more even within the body of the weave. The curve is less pronounced when the yarn is off the loom, as shown in figure 33; this is again due to a release of tension.



Figure 31 Nicola Moody, Sample 26, detail, in process, 2023

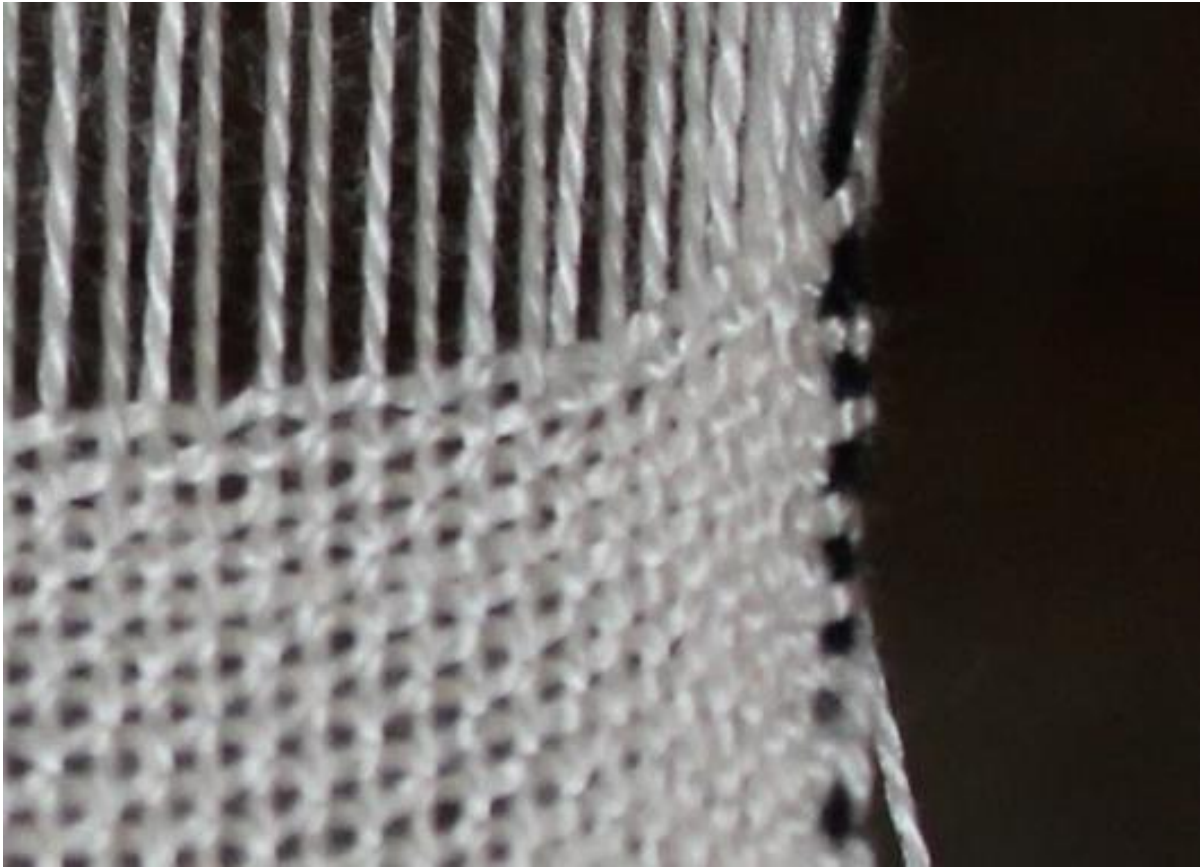


Figure 32 Nicola Moody, Sample 4, detail, in process, 2023

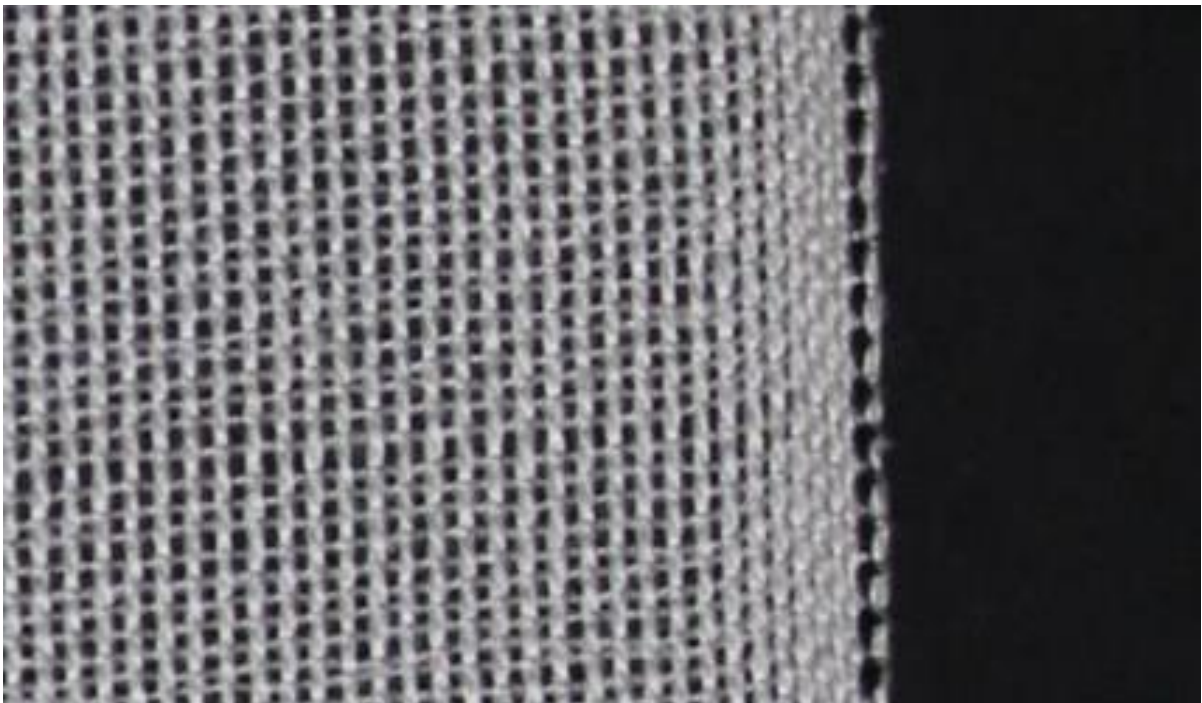


Figure 33 Nicola Moody, Sample 4, detail, off the loom, 2023

Additional movement at the selvedge means that these yarns are under greater strain. For this reason, weavers often double up the warp threads at the selvedge. This can be insufficient to prevent the yarn from snapping under this additional stress. Figure 34 shows a

series of warp threads that have snapped. Without an intervention, these loose lines of yarn will impact the structure of the weaving. They may become entangled and knot. This behaviour will affect how and where weft threads can be inserted. The strain that lines of yarn are under at the selvedge will then be applied to the next warp threads, which they had previously protected.



Figure 34 Nicola Moody, Sample 1, detail, in process, 2023

In the weaving process, the outer weft threads can also be thought of as more vulnerable. They are less restrained by surrounding weft threads and are freer to move within the warp as shown in figure 35. This movement becomes even more apparent when the fabric is off the loom as the warp threads are no longer rigid. As the end of a weft thread moves down away from the body of the weaving, the rest of the line also moves. The weaving becomes looser and weaker as it frays shown in figure 36.



Figure 35 Nicola Moody, Sample 10, detail, in process, 2023



Figure 36 Nicola Moody, Sample 4, detail, off the loom, 2023

How do the lines of yarn behave when combined with other lines of yarn?

Cazeaux argues additional properties can be observed of a material by being attentive to how it behaves when it interacts with another material. All my samples have been created from the same material, mercerised cotton. However, because the yarns are of different weights and have, therefore, been constructed differently, when they are combined, they have the propensity to generate differences in the behaviour of each other. They can also generate qualities within the subsequent weaving that are different to those generated by following the same process with warp and weft yarns of the same weight. Three significant behaviours were observed through the creation of samples that combined yarns of different weights:

1. Movement of lines of weft within the weaving.
2. Changes in the qualities of the fabric.
3. The curling of the fabric.

Movement of lines of weft

In all the samples the spacing of the warp threads corresponded to the ratio necessary for a balanced weave in relation to the weight of the warp yarn. When a finer weft yarn was used alongside a thicker warp yarn, more weft threads were required than warp threads within a given measurement. The weft threads had fewer interactions with the warp threads because they were more widely spaced than would have occurred in a balanced weave in which the warp threads were of the same weight. The finer weft yarn was suspended between warp threads for longer. This meant that the weft was slacker than in a balanced weave. The slack allowed for a greater degree of movement of the weft within the weave. This was particularly noticeable when the warp was pulled around the back beam as can be seen in figure 37.

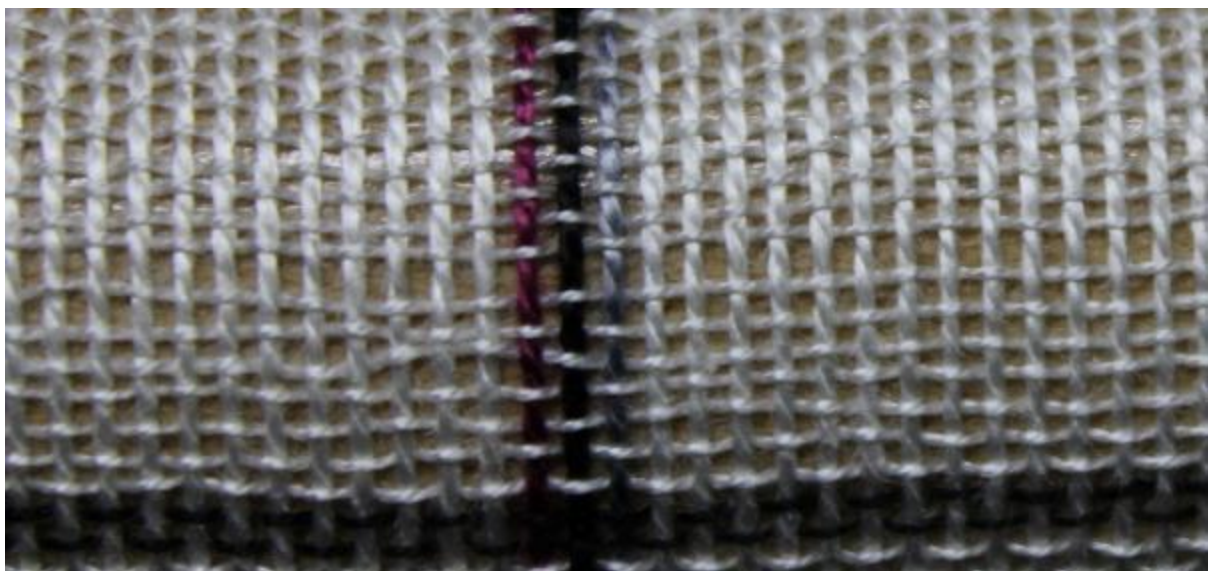


Figure 37 Nicola Moody, Sample 25, detail, in process, 2023

The movement of weft threads meant that the spacing of some weave structures became more open and the fabric as a whole was less rigid. This was particularly apparent with satin weave because fewer warp threads are raised. The fine yarn had to travel further between the raised warp threads. The accentuated looseness of weft threads created by combining a fine weft with a thick warp can be seen in figure 38. Here 30/2 ne fine weft yarn traverses the 3 x 8/2 ne hand-plied yarn that I created. As a result of the slack in the weft threads, the weave structure was inconsistent. The weft lines did not always run perpendicular to the warp as shown in figure 39. Some sections were tightly packed and other sections remained

more open. This movement continued when the weaving was off the loom, and despite the weaving being measured at approximately 8 inches when on the loom, the slippage of weft threads meant that the woven section of this sample measured approximately 6 inches (figure 40).



Figure 38 Nicola Moody, Sample 24, detail, in process, 2023

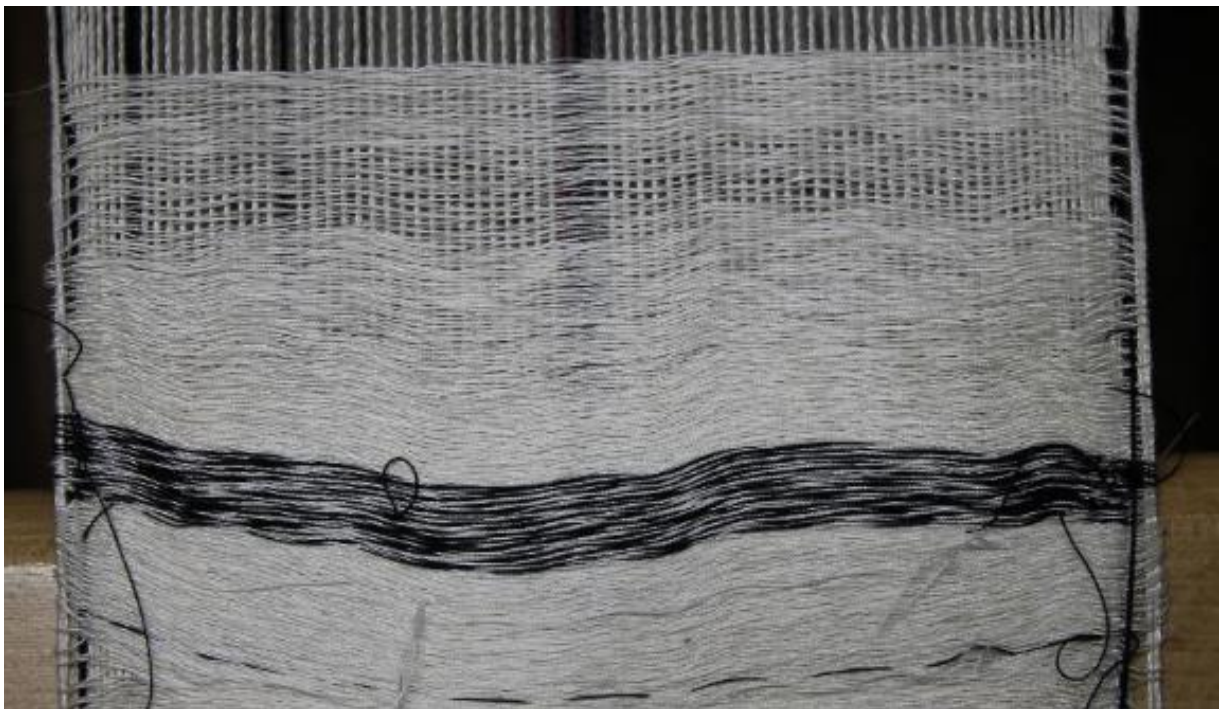


Figure 39 Nicola Moody, Sample 24, detail, in process, 2023



Figure 40 Nicola Moody, Sample 24, 2023

Changes in the qualities of the fabric.

Combining a thicker warp and a finer weft also impacted the qualities of the fabric. Figures 41-43 show the same weave structure 'twill' used with the same warp threads, the plied yarn. Figure 41 is a balanced weave as the warp and weft are the same. Figures 42 and 43 have finer yarns – the finer the weft yarn the finer the fabric. The chevron shapes created by the twill pattern become more condensed and less obvious the finer the yarn. The thicker the yarn, the more pronounced the texture as the thicker weft threads have a greater degree of undulation over the warp. The finer the yarn, the slower the warp is covered. A larger number of interactions occur between warp and weft and the structure is more transparent and delicate.



Figure 41 Nicola Moody, Sample 8, 2023



Figure 42 Nicola Moody, Sample 26, 2023



Figure 43 Nicola Moody, Sample 23, 2023

Curling of the fabric

Several of the samples curled in different directions when they were taken off the loom as shown in figures 44-52. These samples combined a hand-plied yarn as weft 3 x 8/2 ne and a finer yarn as warp. As figures 44-46 show the curling did not occur when the same plied yarn was used as warp and weft. Figures 47-49 show the plied yarn with the 30/2 ne mercerised cotton warp and figures 50-52 show the plied yarn with the 8/2 ne mercerised cotton warp.



Figure 44 Nicola Moody, Sample 7, 2023



Figure 45 Nicola Moody, Sample 8, 2023



Figure 46 Nicola Moody, Sample 9, 2023



Figure 47 Nicola Moody, Sample13, 2023



Figure 48 Nicola Moody, Sample 14, 2023



Figure 49 Nicola Moody, Sample 15, 2023



Figure 50 Nicola Moody, Sample 19, 2023



Figure 51 Nicola Moody, Sample 20, 2023



Figure 52 Nicola Moody, Sample 21, 2023

Fabrics created from plain, twill and satin weave structures all curled. The curl appeared to be more pronounced when these combined yarns also combined with the satin weave structure. Satin weave produces two distinct sides to the fabric. The weft-facing side was dominated by the plied yarn and for this reason, it was this side that curled inwards over the warp-facing side. The curling behaviour of the fabric did not appear to be significantly influenced by using 30/2 ne or 8/2 ne yarn. What mattered was that the plied yarn was combined with a finer yarn. The curling happened because of this relationship. The additional twist that had been added to the plied yarn was released within the fabric. The way these lines behaved, and the behaviour of the subsequent fabric, was the result of processes that the lines had undergone prior to the weaving.

What can be known about the lines' behaviour from its impact on the weaver?

One of the ways that observations can be made of the impact of a line's materiality on its behaviour is by observing what the weaver needs to do in response to differences in the behaviour of lines. The responses can change according to the type and location of the yarn in the weaving. What may work with certain materials will not necessarily work with others. Differences in the treatment of yarn may also be required according to when and where the

lines of warp and weft interact. These differences generate different qualities within the subsequent fabric.

In the creation of my samples, some of the warp threads snapped during the weaving process. To rectify the situation, it was sometimes possible to tie a knot. If the snap was nearer the weaving tying a knot could work because the knots would soon become part of the weaving. Where this was not the case the raising and lowering of yarn meant that the yarn could gradually become looser in the knot. This would result in uneven tension and the possible formation of loops and tangles as discussed earlier in this chapter.

An alternative approach is to attach an additional length of yarn to an end nearer the fabric. When this happens, to ensure that the tension is even, weavers often attach this yarn to a weight. The amount of weight depends on the type of yarn. Although weights can be bought for this purpose, I tend to use a collection of metal objects as shown in figure 53. In this example I initially only attached the lock, this proved to be insufficient, I therefore added additional weights. The build-up of weights enabled me to gradually ascertain the requirements of these lines of yarn in order to behave in a similar way to the rest of the warp. Adding too much weight can cause the yarn to snap again. It can also cause the yarn to become too taut and although it does not snap this tautness is visible in the fabric when these lines combine with the weft lines. This is illustrated in figure 54, here weights were added due to an error I had made in which I had missed out these lines of yarn when threading up. The warp is so taut that the weft threads do not have to contour the warp to the same extent as the surrounding warp leading to slackness in the weft. This yarn was not as compressed; the fibres were more dispersed within the strand which resulted in the creation of a distinct line within the weave.



Figure 53 Weights on a warp used to increase tension, 2023

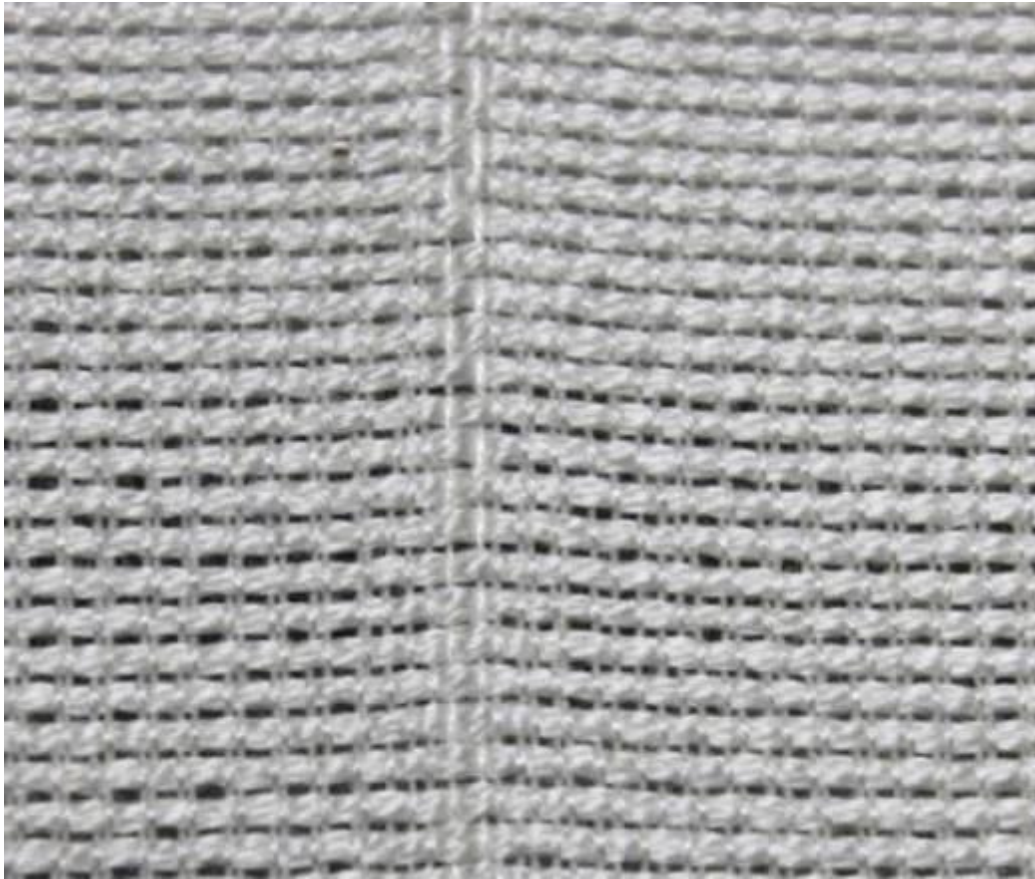


Figure 54 Nicola Moody, Sample 13, detail, in process, 2023

Reflections (know-what)

Once the samples were completed, I reflected on the key factors that impacted the behaviour of these lines of yarn within these weavings. I viewed the photographs of the process, listened to the audio recording and studied the individual samples when off the loom. I identified five factors that impact how and where lines of yarn can relate in weaving:

- Tension: the amount of tension the lines are under impacts the structure of the weaving and the ability of the weaving to continue.
- Order: the order in which warp and weft threads connect impacts the structure, strength and texture of the weaving.
- Density: the amount of warp threads in relation to weft threads can impact the structure of the weaving and potentially the vulnerability or flexibility of this structure.
- Prior processes: the properties of the lines can impact their behaviour, the behaviour of other lines that they relate to in the weaving and the behaviour of subsequent fabric. The properties of the lines will be impacted by the processes they have undergone prior to any engagement in weaving.

- Constraints of the loom: the use of a loom or form equivalent to a loom is necessary for lines to be held under tension. The loom can impose restrictions on the lines that can further impact their behaviour.

I use each of these factors as the subject matter for subsequent individual woven artworks described in the following chapters. Each woven structure offers a way of perceiving weaving as the result of distinct, dynamic and continual interactions between lines of yarn.

Conclusion (Know that)

By substituting 'lines of thread' with 'lines of life' and 'structure of the weave' with 'structure of the meshwork', I propose the following insights to an understanding of how lines relate within Ingold's meshwork. The amount of tension that the lines of life are under impacts the structure of the meshwork and its ability to continue growing. The order in which lines of life connect impacts the structure, texture and strength of the meshwork. The density of interactions of lines of life impacts the structure of the meshwork and potentially its vulnerability and flexibility. The processes that have led to the creation of the lines of life prior to their engagement with other lines of life can impact the structure of the meshwork and the behaviour of other lines of life within it. The structure of the meshwork is dependent on some lines of life being straight. If these lines require specific conditions within their environment to become straight, these conditions can further impact its structure.

Equating these findings to the 'know-that' of Nelson's model, I explore them further by creating additional 'insider' knowledge through the creation of specific artworks, drawing on the 'know-how' of my practice. Each of these works, and what they can contribute to an understanding of weaving and Ingold's meshwork, will be examined in more detail in the following chapters. This process forms part of the reflective 'know-what' stage of Nelson's model, in which I reflect on what is happening when the work is on and off the loom, in conjunction with Ingold's assertions about the creation of his meshwork.

Satin explores how the relationship of warp and weft impacts the weave structure and texture. *Moving Warp* explores the behaviour of lines of warp within a woven structure when some of the restrictions imposed by a loom are no longer present. *Moving Weft* explores how the relationship of weft to warp can generate movement within the weave which can impact the density of the woven structure. *Loop* explores the impact of different tensions on a woven structure. *Curl* explores how processes that the yarn has been through prior to its engagement in weaving can impact the structure, shape and behaviour of the weaving.

Chapter 3 Samples as an artwork

Rather than seeing the samples as a means to an end as discussed in 'Parameters' in Chapter 2, I have composed them to create an artwork (figure 55). Each sample is mounted on a black board, each board 10"x 10". They are composed in a grid that references a point-twill or herringbone weave.⁷ In this chapter, I explain why the samples have been presented in this way. I also explore how this work can offer insights into Ingold's categorisation of lines into 'threads' and 'traces' and how these relate to 'surface.' I then suggest what an understanding generated through the creation of this artwork can offer to the behaviour of lines in Ingold's meshwork and lines in weaving.



Figure 55 Nicola Moody, Samples, 2023

⁷Herringbone is also known as reverse twill or point-twill. A twill pattern is constructed but after a given number of repeats the order is reversed creating a zig-zag pattern.

Composition

The black boards were used to enable the works to stand out against the anticipated white walls of the exhibition space. The boards were identical in terms of size. Mounting the samples on the boards emphasized differences in the dimensions of each sample. The boards also provided a degree of protection. Some, such as sample 24 shown in figure 56, were particularly fragile. Each board presents a weaving which can be seen as a site of activity between lines of yarn. Each board can also be read as a unit and although there are differences between them there is also a degree of uniformity. They can be seen as separate components, but collectively they have a relationship to each other.



Figure 56 Nicola Moody, Sample 24, 2023

As individual units, the boards could be moved into different compositions. This inevitably created patterns within a grid structure. The grid is a fundamental part of weaving. Curator Jennifer Scanlan describes woven textiles as the 'materialization of the grid' (Scanlan 2015, 216) – warp threads intersect with weft threads at right angles and fabric is created. A two-dimensional interpretation of the order in which warp and weft threads interact is presented in the form of a weaving draft. Examples of drafts used for the creation of the samples can be seen in figures 57-59. The black and white squares indicate the interplay of warp and weft. They show how often a weft thread passes over consecutive warp threads and illustrate the connections made.

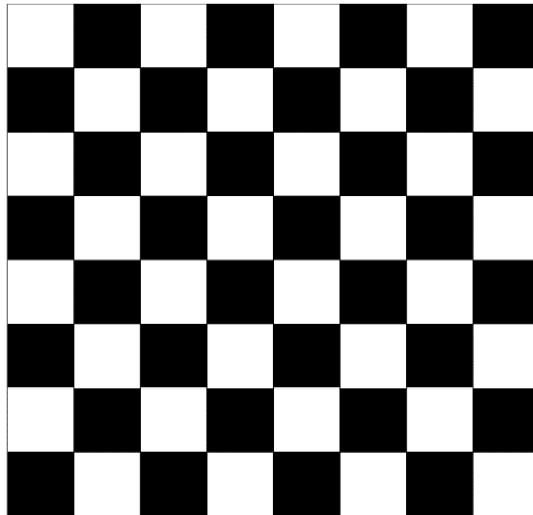


Figure 57 Plain weaving draft

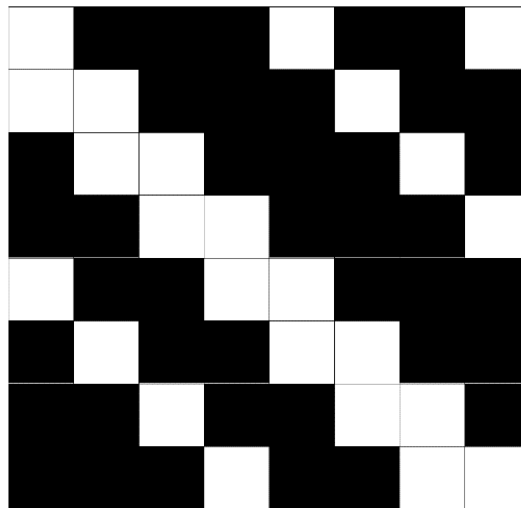


Figure 58 Twill weaving draft

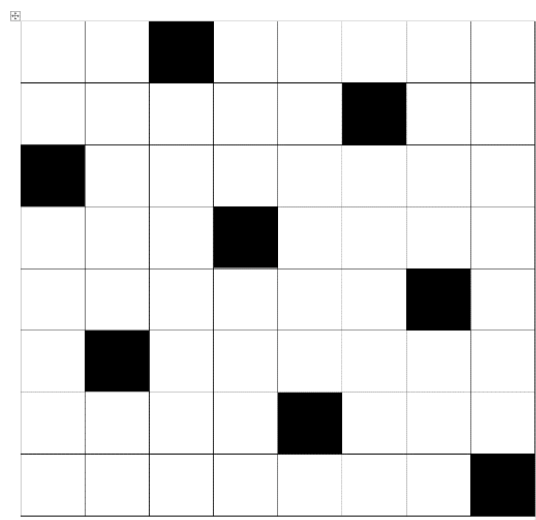


Figure 59 Satin weaving draft

Samples makes a metaphorical connection to weaving. The arrangement of black boards on the white wall enables the work to be read as a weaving draft. The woven samples on the black squares give a similar appearance, yet each is seen as unique on closer inspection. This resembles weaving – it can be perceived as a homogeneous whole, however, on closer inspection it can also be understood as unique interactions between distinct lines of yarn. The samples are ordered from right to left and left to right and back again in the order in which they were created. The 9 squares made with the 30/2 ne warp are followed by 9 squares of 8/2 ne warp followed by 9 squares of 3x 8/2 ne warp. The order references the direction of the weft threads.

Samples makes use of a point-twill pattern. The boards can be understood as the equivalent of a warp thread travelling over a weft thread. The white spaces can be understood as the weft passing over the warp. Figures 60-64 show the boards in different configurations that relate to weave structures. Figures 60, 62 and 64 are most in keeping with the weave structures that were used for the samples created on an 8-shaft loom. Any of these arrangements could have been used for the final design. Only the plain, twill, and 4-point-twill layouts were composed solely of the 27 samples. The 4-point-twill layout resembles the point-twill from the samples and of the three options presented, it is the most complex pattern structure.

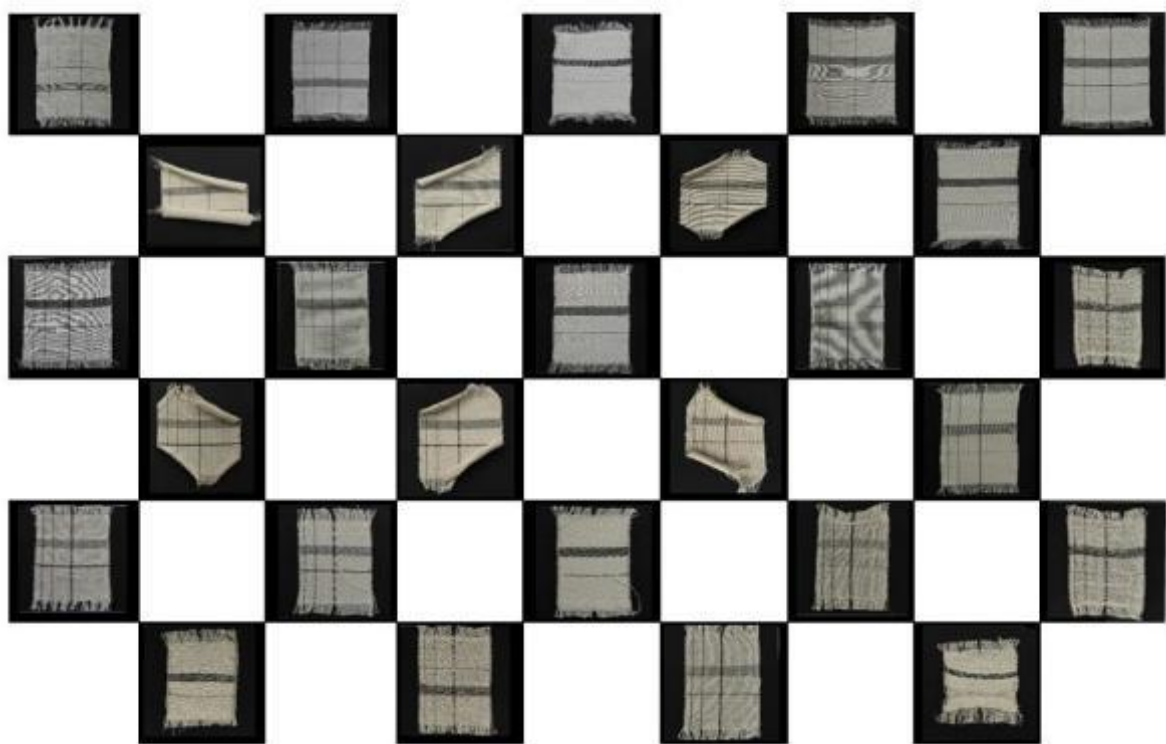


Figure 60 Nicola Moody, plain weave layout for samples, 2024

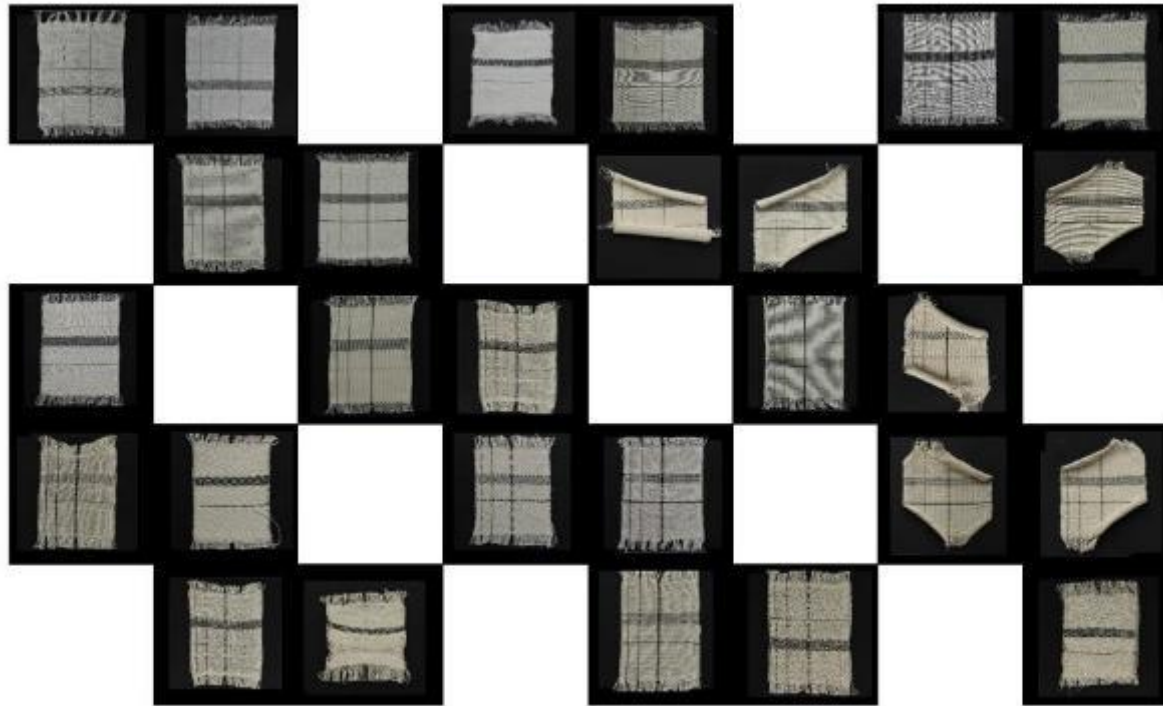


Figure 61 Nicola Moody, twill weave layout, 2024

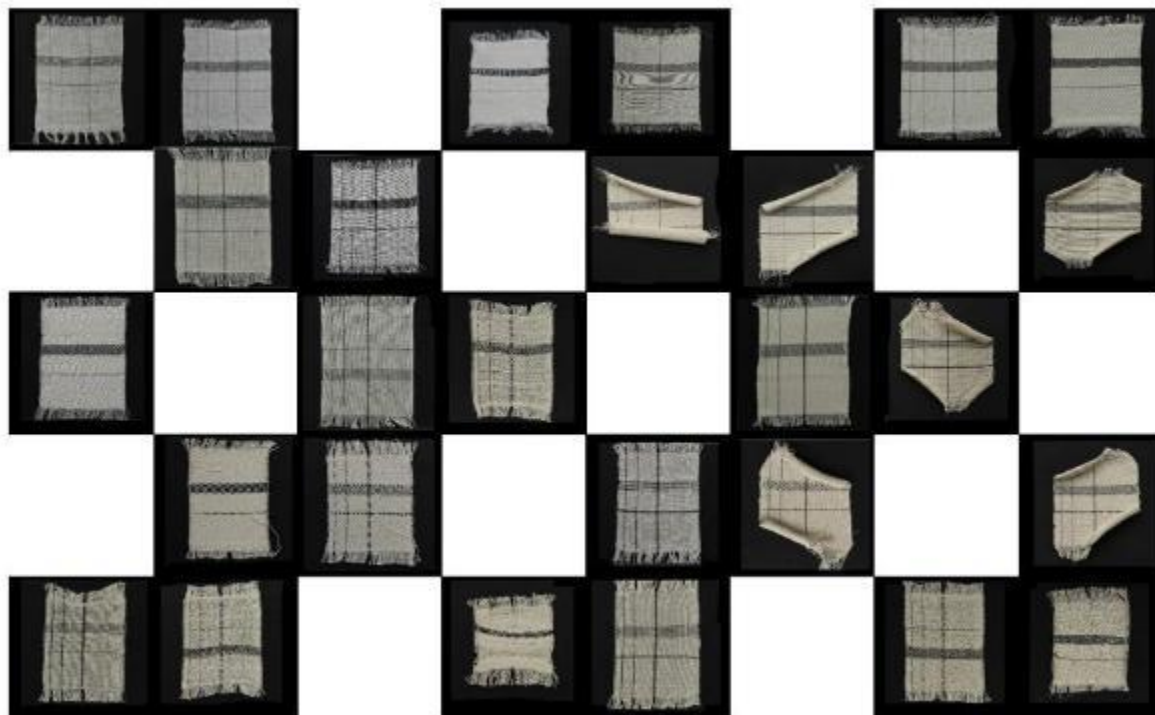


Figure 62 Nicola Moody, 4-point-twill layout, 2024

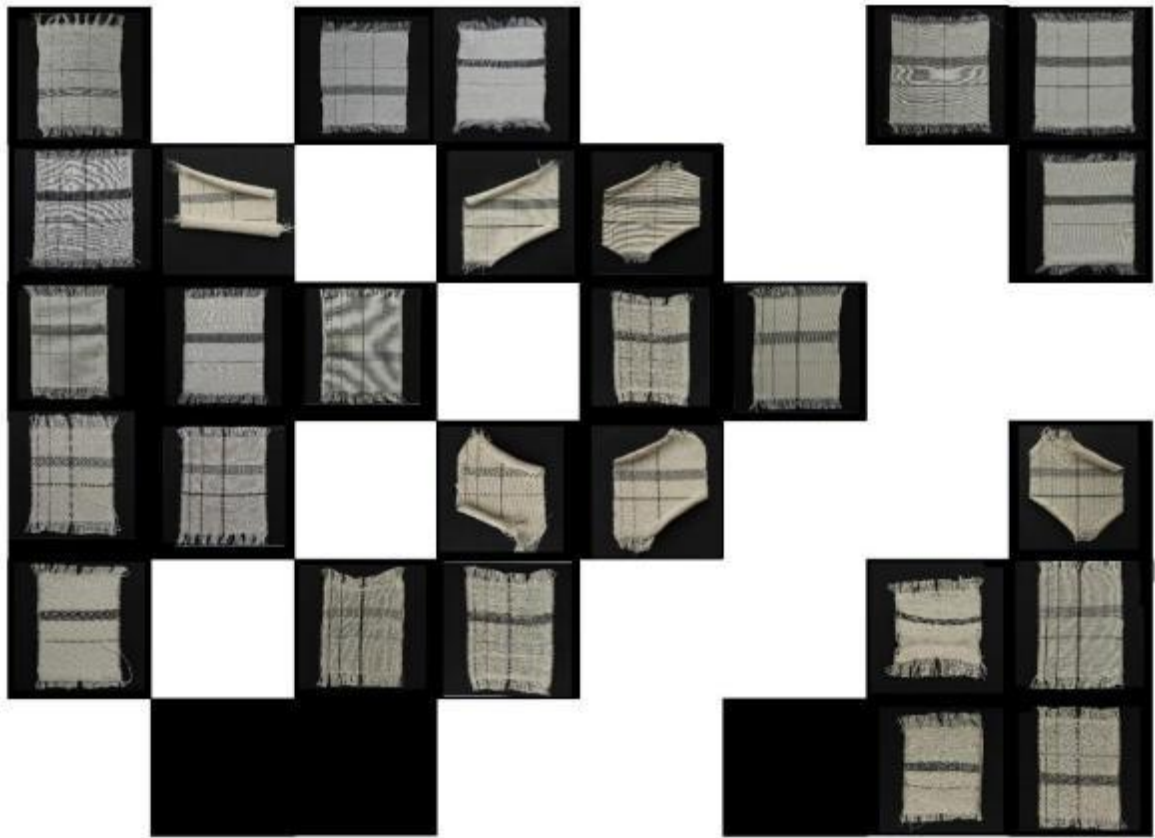


Figure 63 Nicola Moody, 8-point-twill layout, 2024

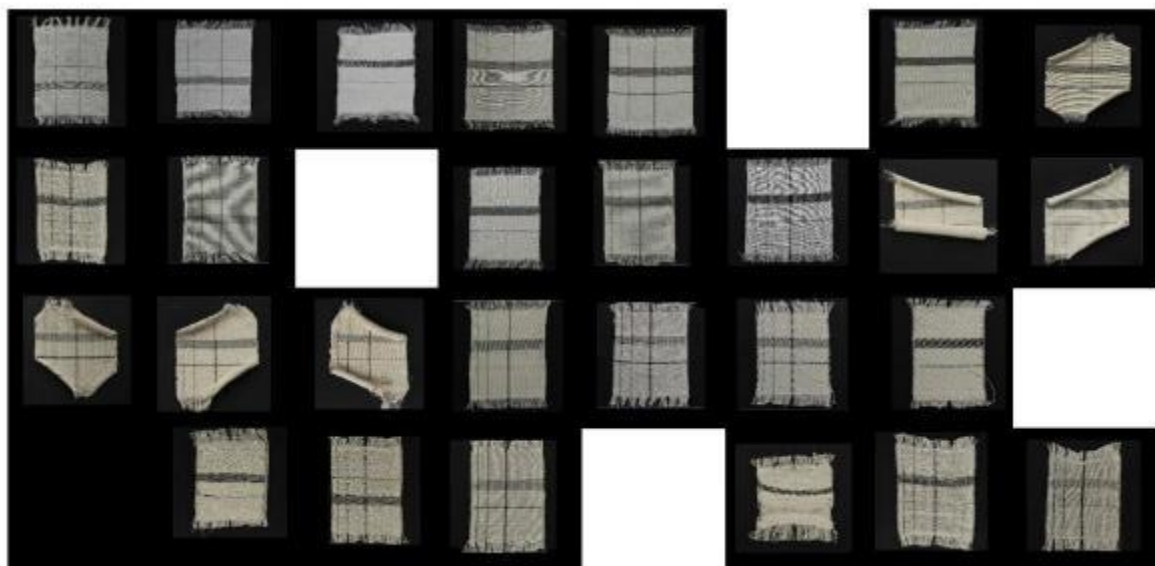


Figure 64 Nicola Moody, satin weave layout, 2024

Albers argues that, in most cases, a weaving draft 'is all that is actually required as information about a weave'. Rather than being the fabric itself, the draft functions as a conceptual blueprint, enabling understanding of the textile before it is created. With industrialisation and the introduction of multi-shaft looms, Albers states that the need for such drafts increased, as they allowed for the creation of more complex patterns. The weaving drafts illustrated in figures 60-64 are relatively simple. Figure 65 shows a more complex draft made possible with a 28-shaft loom.

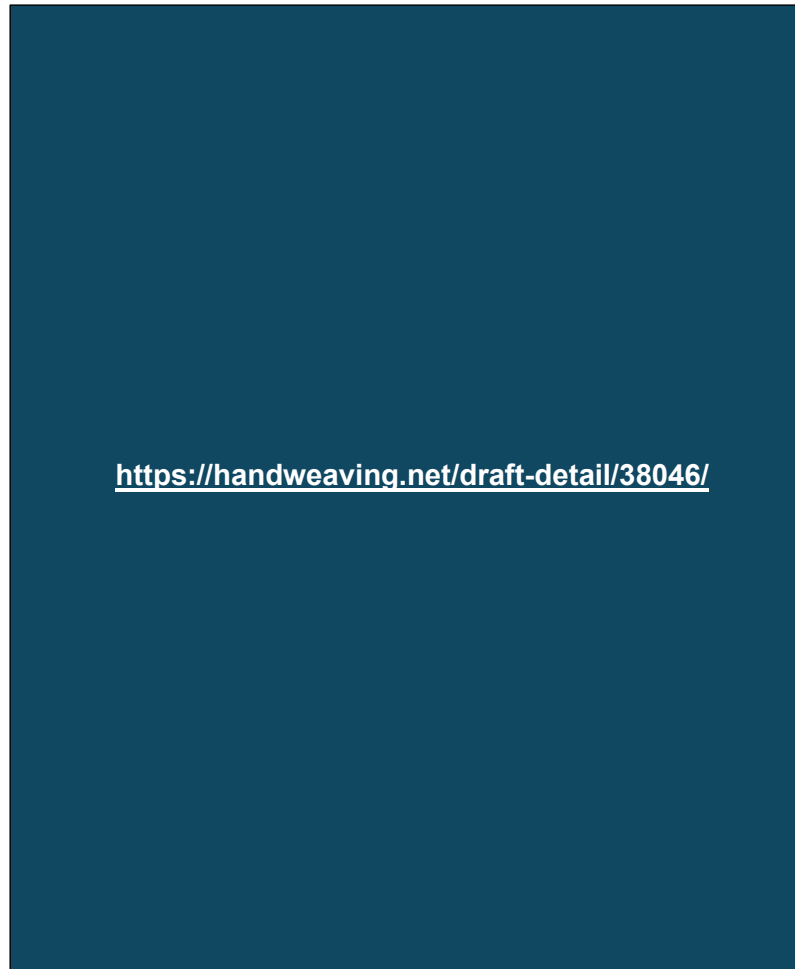


Figure 65 Screenshot of a weaving draft

The level of complexity possible in weaving was increased through the creation of Jacquard looms that utilised numerous punch cards, each indicating specific interactions between warp and weft. Smith, reflecting on Albers' use of the term 'event,' describes the weave draft as 'an algorithm, as it were, of the modern event of a thread,' viewing the draft as the starting point that paved the way for mechanised developments. Building on what has already been documented about the link between Jacquard loom cards and binary computer codes. Smith is asserting that the widespread use of algorithms today can be traced back to the logic embedded in weaving drafts. It can be understood as 'code' that, when followed systematically, can generate complex outcomes.

Ingold's concept of the meshwork does not follow a predetermined blueprint. Instead, it emerges through the dynamic interaction of materials and forces, which generate lines that respond to and influence one another, ultimately forming the meshwork. This process stands in contrast to the prescriptive nature of a weaving draft. Nevertheless, the existence of weaving drafts highlights that weaving can be an incredibly complex process. At a basic level, weaving is understood as the weft threads passing over and under the warp threads. What Albers refers to as 'the event of a thread'. Weaving drafts show how these 'events' can generate intricate and specific interactions between warp and weft.

Figure 66 shows *Connected to Me* by artist Lia Cook, created on a Jacquard loom. The creation of this work required precise, individualised interactions; it is unlikely that the same sequence of raised warp threads was regularly repeated. Understanding how lines interweave and the resulting structures that emerge need not be limited to viewing them as repetitive. Rather, it can involve distinct interactions. In the case of *Connected to Me*, a computer determined which warp threads to raise at each moment, carefully planning the sequence. In contrast, within Ingold's meshwork, interactions arise in response to what has already occurred and what is unfolding in the surrounding environment. In this sense, the 'weave' of the meshwork is also complex, but rather than consisting of a repeatable pattern, it is composed of specific, situational interactions.



Figure 66 Lia Cook, *Connected to Me*, 2016

The connection that Ingold establishes between the behaviour of lines in his meshwork and the behaviour of lines in weaving suggests that the meshwork must incorporate a grid structure. For lines to hold together within a grid it matters when and where the lines interact. To ensure that a weaving or Ingold's meshwork can grow, a line must vary when and where it passes under and over other lines. The interaction of lines within Ingold's meshwork could follow a simple pattern but there could also be possibilities for much greater complexity. The more connections within a given measurement the stronger the structure. The more variety of interactions the more varied the structure and pattern of the weave.

Traces, treads and surface

Samples also generates a way of understanding the connection that Ingold presents between 'traces' 'threads' and 'surface.' Ingold writes that in creating his taxonomy of lines 'two kinds of line did seem to stand out from the rest, and I called them threads and traces' (Ingold 2007,2). 'Threads' are understood as a filament. They have a surface and exist in space. A 'trace,' according to Ingold requires a surface. Ingold further categorises traces into those that are additive, such as in the application of charcoal on paper and those that are reductive such as a line impressed into clay. Despite these distinctions, Ingold goes on to state 'on closer inspection, threads and traces appeared to be not so much categorically different as transforms of one another... whenever threads turn into traces, surfaces are formed, and whenever traces turn into threads, they are dissolved' (Ingold 2007, 2).

The definition of lines that can be found in space and do not require a surface as 'threads' makes sense in relation to the threads of weaving. Threads of yarn are 3D, and their interconnection creates an additional surface and form. Artist and author Donald Willcox writes of weaving 'every single thread is itself a separate, three-dimensional form. When threads are run over and under each other, the result will always be three-dimensional' (Willcox 1970, 29). Ingold's interpretation of lines as 'threads' or 'traces' demands a specific perspective. His proposition that in weaving, 'thread' lines are held together, and subsequently, these lines can be seen as 'trace' lines since they reside within a surface, necessitates an additional level of perception.

Sample 15 shown in figure 67 provides a way of understanding how the threads of weaving have generated a trace within the work. The line is noticeable on the surface because of the additional undulation that is part of its movement within the fabric. Ingold's understanding involves a shift in perspective. How a line of yarn is interpreted changes as a result of its engagement with other lines. Lines that are actively involved in the weaving process could still be deemed to be 'threads.' Lines that have become part of the weaving could be

deemed to be 'traces.' However, as a 'thread' and as a 'trace', this yarn is always understood as a line.



Figure 67 Nicola Moody, Sample 15, detail, off the loom, 2023

It is easy to understand the concept of a surface dissolving when that surface refers to a fraying fabric, as illustrated in figure 68. 'Trace' lines that were in the fabric have become disconnected from the other 'trace' lines and can now be understood as 'threads.' For Ingold, however, 'additive' painted lines on a surface can also dissolve the surface on which they are applied and in turn, be understood as 'threads.' He argues this point by referencing the painting of white pigment by the Abelam men of East Sepik Province in Papua New Guinea on to spathes of the sago palm, as shown in figure 69. The patterning is applied to a surface and for Ingold, the surface is understood to dissolve. The lines take precedence and are seen as separate from the surface and as such are understood as a thread.



Figure 68 Nicola Moody, Sample 27, 2023

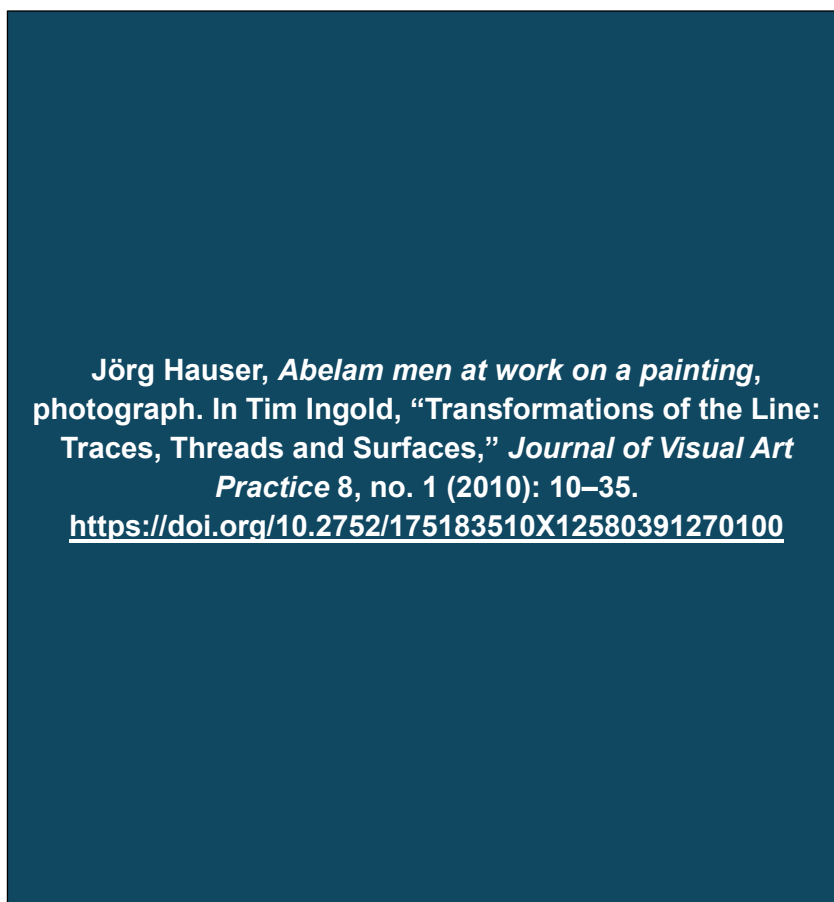


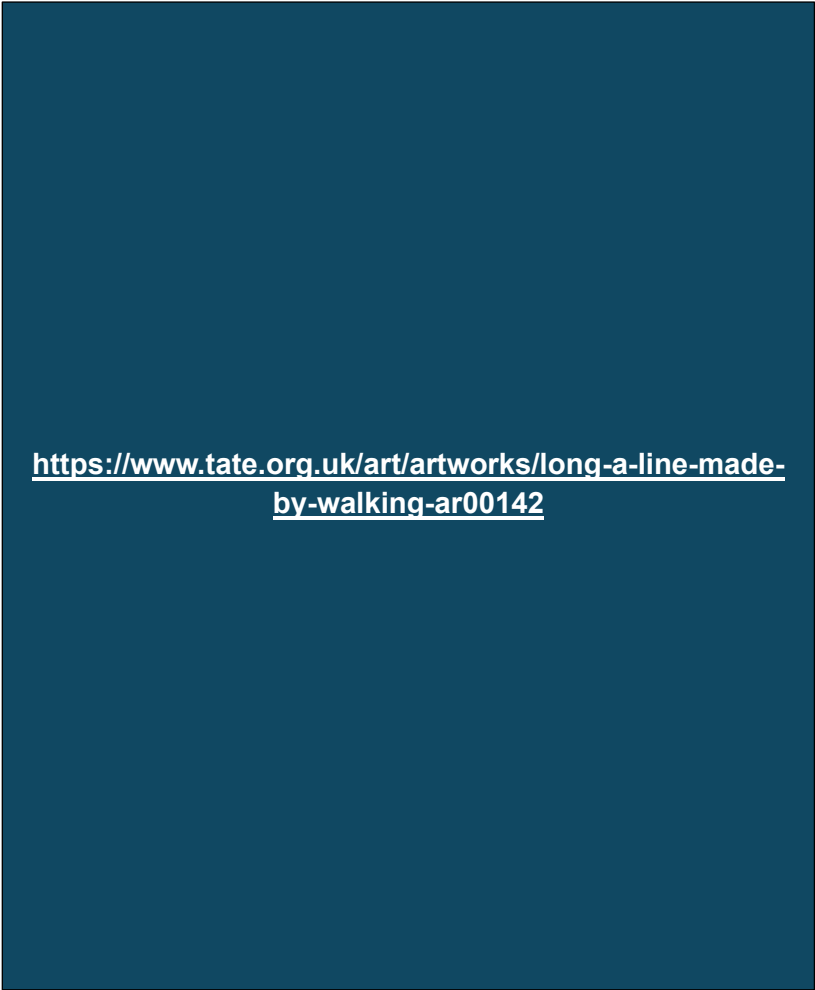
Figure 69 Screenshot: *Abelam men at work on a painting*, photograph by Jörg Hauser (Ingold 2010b, 24)

Ingold also provides an example of how the 'reductive trace' line created in the forming of a labyrinth can transition into a 'thread' line. He writes 'at the very moment of going underground, of entering the labyrinth, the surface itself disappears from sight. It appears to dissolve' (Ingold 2007, 56). In this context, the path of the labyrinth is understood as a thing separate from the surface. The sense of being in or on a surface associated with a 'trace' line is no longer present; it has been replaced by a sense of moving in space and is now conceived to be a 'thread' line.

I am an outsider to Ingold's anthropological knowledge, just as he is an outsider to the knowledge as an artist-weaver; therefore, I recognise I may not understand what he is saying from the perspective of the Abalam or anthropology. However, I question how the surface – in Ingold's example, the spathes of the sago – can be perceived as disappearing. For me, there is an argument to be made that the surface still exists but is simply covered by the paint. Similarly, I question how, in Ingold's example, a participant walking through the labyrinth causes the surface to disappear. My understanding is that they are still navigating the labyrinth by walking on the surface. The answer to my questions seems to depend on my perception of what is happening, and particularly my understanding of what constitutes the surface.

In *Samples*, the weavings can be understood as surfaces which reside on another surface, the black boards. These boards can also be seen as residing on a third surface: the wall on which the boards are displayed. The boards could be understood as surfaces in the same way that weaving is understood as a surface. The boards are made of wood composed of fibres. The fibres could be understood as the threads from which the wooden surface is created. Ingold writes of a carpenter working with wood that 'his making was itself a practice of weaving: not the imposition of form on pliant substance but the slicing and binding of fibrous material' (Ingold 2011, 211).

Collectively, the boards can be seen to create 'additive trace' lines as they are positioned on the surface of the wall. The positioning of the boards also generated negative spaces around them, which could be understood as reductive 'trace' lines. Artist Richard Long's seminal work *A Line Made By Walking*, shown in figure 70, is an example of a line generated because of a distinction in the height of things that reside on a surface. In Long's case, the grass has been bent and flattened by his footsteps. In *Samples*, the blackboards frame a section of the wall, creating a path, the wall has become part of the artwork.



<https://www.tate.org.uk/art/artworks/long-a-line-made-by-walking-ar00142>

Figure 70 Richard Long, *A Line Made By Walking*, 1967

Objectively, it is hard to conceive how lines can transition from ‘traces’ to ‘threads.’ A shift in the perception of the relationship of the surface to the line is necessary to make this leap in understanding. Ingold writes that ‘it is not enough to consider lines in themselves. Everything depends on the relation between lines and surfaces’ (Ingold 2017a, 54). In *Samples*, the wall is now understood to be part of the artwork, an entity with a specific form. Making use of Ingold's argument, from my different disciplinary perspective, the surface on which the boards are displayed is no longer read as a surface and in this sense, it has been dissolved. The artwork contains ‘trace’ lines but can also be understood as a line itself, a thing in space, which means that it should be perceived as a ‘thread.’

Ingold presents a cyclical understanding of the connection between threads, traces and surfaces. He writes, ‘in a world of materials there cannot be lines without surfaces, or surfaces without lines. Wherever surfaces exist, they must have somehow formed through a linear weaving of materials. And wherever lines exist, they must either be traced in a surface or threaded through it’ (Ingold 2017a, 53). Ingold presents weaving as the process through which a surface is formed from preexisting surfaces. Weaving can, therefore, be understood

as a process of line transformation. Findings made in the creation of the samples (explored in Chapter 2) could be understood as observations of the process of lines transitioning. The 'trace' lines within a weaving could be understood as a record of what the thread lines of weaving have been through. When a weaving unravels, any record or 'trace' of what the lines have been through is lost. As the woven surface dissolves the lines do not disappear, they transition back into 'thread' lines.

Through his meshwork, Ingold presents an understanding of a world created through lines of life moving and growing together. They relate as lines do in a weaving. In this sense, the lines of life can be perceived to have their own surface and through their interconnection, they create another surface of which they are part. His description of the meshwork as 'interwoven threads' (Ingold 2011, xii) could be nuanced and described as interwoven threads becoming traces within the meshwork. The transition is part of the moving and growing that the lines undergo. Ingold's proposition that a surface is dissolved when traces transition into threads can be understood in two ways. The surface unravels and the traces return to threads. The creation of a weaving can also be the creation of an additional thread. In other words, lines of 'thread' are woven together and transform into 'traces.' The weaving has a structure and a surface and, therefore, can be understood as a thread. This thread could potentially find other threads, connect with them and repeat the transformation from thread to trace. A perpetuation of this relationship could see the ongoing growth and movement of lines within the meshwork. These ideas will be explored further in an additional artwork, *Ever-Evolving*, discussed in Chapter 10.

Chapter 4 Satin

This chapter explores knowledge generated through creating the artwork, *Satin*. I propose that the characteristics of Ingold's meshwork emerge from the combination of the properties of the lines that form it, which may differ from the properties of a single line. Using Ingold's understanding of line, the chapter aims to demonstrate how weaving can be understood as a dynamic 'thing'. It also argues that pattern is an intrinsic part of Ingold's meshwork. Furthermore, it uses *Satin* to explore how intangible and supplementary lines can be integrated and formed through the interweaving of tangible lines, thereby suggesting how additional lines can be produced through the formation of the meshwork.

Satin uses predominantly black yarn as warp and red yarn as weft. These contrasting colours visually demonstrate how the order in which the warp and weft interact leads to the creation of different surfaces with different textures; one is warp-facing (figure 71) and the other is weft-facing (figure 72). Additional colours are incorporated as warp and weft to demonstrate further when and where the lines of yarn interact. In figure 73, for example, white lines of weft can be contrasted with the small stitches or dots of the white warp lines.



Figure 71 Nicola Moody, *Satin*, warp-facing, 2023



Figure 72 Nicola Moody, Satin, weft-facing, 2023



Figure 73 Nicola Moody, Satin, detail, 2023

Properties

Satin is composed of mercerised cotton 3/2 ne. A strand of this yarn is soft. When the yarn is pulled and tension is applied, as in the case of the warp threads, the fibres come closer to each other. The stretched yarn becomes rigid and has less give. When the warp threads dominate the rigidity of the edges of the lines of yarn create a rougher texture. On the reverse surface, the warp threads are much less discernible. The weft yarn traverses several warps at a time, as shown in figure 74. These lines are not held in tension they have a greater flow and ability to move, sliding slightly over each other and generating a softer feel. The two distinct surfaces can be seen in figure 75 where the warp-facing surface is curled over the weft-facing surface.



Figure 74 Nicola Moody, Satin, in process, 2023



Figure 75 Nicola Moody, Satin, detail, 2023

Chemist J Gordon Cook writes, 'the properties of any material must depend very largely on the fibres from which it is made' (Cook 1968, xv). Writing more recently, Richards, in her discussion on characteristics of fibres, yarns, and weave structures in the creation of material, makes a similar point. She states that although these can be examined individually, 'time and again it is the interplay of properties that is important' (Richards 2012, 11). The properties of *Satin* come from the properties of its constituent parts, namely, mercerised cotton yarn 3/2 ne. The properties of the yarn are known through interaction. The mercerised cotton yarn can have soft and rigid characteristics. These cannot be displayed at the same time in one strand of yarn. Interactions with materials and between materials are, according to Cazeaux, how the material's metaphoricity is revealed (Cazeaux 2017, 94). In the case of *Satin*, it is the interplay of lines of yarn as warp and weft that has led to the simultaneous presence of distinct textures.

Author and weaver Betty Briand states that in weaving 'it is the yarn that we are looking at, not the intersections' (Briand 2023, 42). Briand is right to state that the yarn is paramount, and yet, how the mercerised cotton lines are combined has an impact on the properties of *Satin*. To accurately perceive *Satin* is to understand it as intersecting yarn. To accurately perceive the meshwork is to understand it as intersecting lines. Lines that compose Ingold's meshwork will have distinct properties that contribute to the properties of the meshwork. It is unlikely that this meshwork will be composed of only one material. Ingold describes himself as a linealogist – someone who studies lines (Ingold 2015, 53) – implying that there is more than one type of line. The properties of the meshwork, like those of *Satin*, will arise from the properties rendered to it through the interplay of the lines. Unlike *Satin*, additional properties could also be generated due to the combination of lines composed and constructed differently.

Weaving as a 'thing'

Ingold describes making 'as a modality of weaving' (Ingold 2011, 10). This stems from his understanding of weaving as a process that grows through the interaction of materials. He argues that seeing making as weaving is 'to prioritise process over product, and to define the activity by the attentiveness of environmental engagement rather than the transitivity of means and ends (Ingold 2011). Ingold argues that viewing something as an object means seeing it as having an inside and an outside. He states 'materials are active. Only by putting them inside closed-up objects are they reduced to dead or inert matter' (Ingold 2011, 16). Ingold also writes of weaving that it is a technique that 'produces a peculiar kind of surface that does not, strictly speaking, have an inside and an outside at all (Ingold 2000, 341). Ingold makes a distinction between a 'thing' and an 'object.' Applying this perspective to

weaving shifts the focus: it is viewed not as a finished form but as the continuous movement of material.

Emphasising the process or the journey rather than the destination resonates with Ingold's understanding of 'network' and 'meshwork' discussed in the introduction. Building on psychologist James Gibson, Ingold argues:

The rigid environment, cluttered with objects of all sorts, can be occupied, but it surely cannot afford dwelling. We need a different understanding of movement: not a casting about the hard surfaces of a world in which everything is already laid out, but an issuing along with things in the very processes of their generation' (Ingold 2011, 12).

Ingold contends that in 'network' thinking, lines have been converted into points. He illustrates this with two drawings, which I have copied (figure 76). On the left-hand side, the line, understood here as an organism, has created a bounded shape. Ingold argues that the organism has folded 'in on itself such that it is delineated and contained within a perimeter boundary, set off against a surrounding world – an environment – with which it is destined to interact according to its nature' (Ingold 2011, 69). By opening up the line as shown on the right-hand side, it is perceived to have a forward trajectory. Ingold states 'the relation is not between one thing and another – between the organism 'here' and the environment 'there'. It is rather a trail along which life is lived' (Ingold 2011, 69). These trails, like lines in a weaving, compose the meshwork.

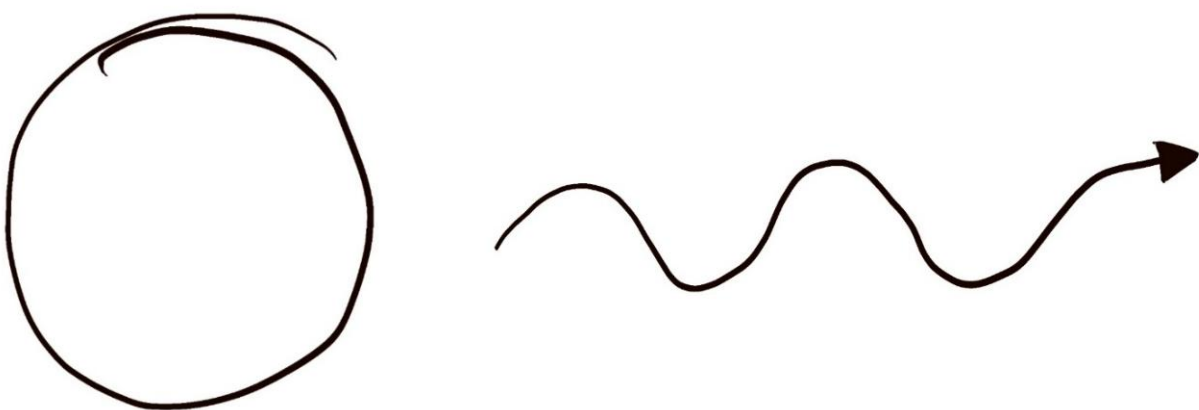


Figure 76 Nicola Moody, copy of drawings by Ingold, (Ingold 2011, 69)

Using Ingold's understanding of 'object,' it could be argued that weaving is often viewed as an 'object,' a finished product, rather than a 'thing' composed of materials that continue to interact. Weavers also often refer to the right and wrong sides of a weaving (Emery 2009, 136). The 'wrong' side is that which cannot be seen during the weaving process. In figure 77 the 'right' side, the side that I can see as the weaver, is at the top of the image and the 'wrong' side is at the bottom, under the section that is being woven. Although the term 'sides' is commonly used in weaving, Ingold's suggestion that a weaving lacks an inside or outside offers a way of contemplating weaving and understanding it as the collective behaviour of lines. In weaving, lines of yarn move around each other. That which may be considered as the back is composed of the same lines as the front.



Figure 77 Nicola Moody, *Satin, in process*, 2023

Ingold describes a 'thing' as a 'going on – or better, a place where several goings on become entwined' (Ingold 2011, 214). Drawing on Ingold, *Satin* can be understood as a 'thing' composed of intersecting lines that gather together, entwine and continue on their journey. *Satin* has evolved through a series of interactions between its constituent parts. By raising the warp in a particular order, there is a suggestion of how *Satin* will develop. However, its development is dependent on the movement of the materials, and it is only through this that the work forms, or using Ingold's term, 'grows' (Ingold 2000, 399).

The different textures of *Satin* are maintained when the work is off the loom. The lines of yarn continue to interact in a particular order. They maintain their relationships. With this in mind, to describe *Satin* as a weaving is to use the term 'weaving' as a verb regardless of

whether it is on or off the loom. Artist Paul Klee argues that a form should not be viewed as an end product but as 'genesis, growth, essence'; he sees form as active. Just as Ingold's meshwork is conceived to be always moving and growing (Ingold 2011) so too can *Satin* and other weavings be thought of as the continual interaction of lines.

In *Satin* (figure 71), *Moving Weft* (figure 78) and *Loops* (figure 79) (artworks created as research), the weft lines are deliberately left hanging from the work and cascade onto the floor (figure 80) or hang from the acrylic pole (figure 81). Displaying the lines in this way supports an understanding that the lines are separate and connected. The warp lines extend beyond the section of weaving. They move in and out of encounters with other lines. As *Satin* demonstrates, the frequency and location of the interactions impact the form and properties of the work.



Figure 78 Nicola Moody, *Moving weft*, 2024



Figure 79 Nicola Moody, Loop, 2024



Figure 80 Nicola Moody, Loop, detail, 2024



Figure 81 Nicola Moody, Moving weft, detail 2024

For display purposes, lines of warp are knotted around clear acrylic poles. Using clear acrylic as opposed to an opaque pole enables the focus to be on the lines of yarn. The top warp lines are knotted. Whilst this may be seen as an end, the lines extend beyond the knots. Ingold states that the lines of the meshwork are like threads that are not contained within a knot, 'rather, they trail beyond it, only to become caught up with other lines in other places, as are threads in other knots (Ingold 2011, 149). Drawing on this understanding, the lines in these artworks can be thought to move through the knot. This concept supports an understanding of the lines as distinct and connected.

Pattern

The word 'weave' is often used synonymously with 'pattern'. To speak of a weave of a fabric is to express how it is made or structured. Weaving is binary, the weft goes under or over. These singular interactions can generate many complex patterns. Textile scientist Kerstin Kraft defines pattern as 'the result of repetitions in time and space. They prove connections between motion and form' (Kraft 2004, 277). Kraft goes on 'all textile techniques are based on the idea of patterning: an isolated unit (repeat) is repeated with potential infinity' (Kraft 2004, 281). Ingold describes his meshwork as an 'ever-evolving weave' (Ingold 2011, 71). It can, therefore, be seen to be created through the repetition of isolated units in time and space.

It is unlikely that Ingold's meshwork will have a consistent pattern. *Satin* follows a given order – weft threads passed over 7 warp threads before intersecting. However, due to inconsistencies in my treddling, this pattern was not always accurately followed. Figures 82 and 83 show a section where the expected interaction had not occurred. The warp thread covered over more weft threads than intended. As Bek-Pederson writes, 'even when randomness is the means by which interactions occur, this randomness could be understood as a pattern' (Bek-Pederson 2009, 35). Inconsistencies in *Satin* have become part of its pattern or 'weave'. The order in which lines go under and over does not need to be identical. The fact that it happens more than once, is a requirement of all weaving. Ingold's assertion that lines in the meshwork interweave (Ingold 2011, xii) means that he is also suggesting that pattern is an inevitable part of its structure.



Figure 82 Nicola Moody, Satin, detail, 2023



Figure 83 Nicola Moody, Satin, detail, 2023

Stripes

As has already been discussed, different coloured yarns were used to visually demarcate when and where lines interact. The use of different colours has led to the creation of striped lines shown in figure 84. Stripes are common in textile design and can be part of the warp or weft. These lines, however, do not comply with Ingold's categorisation of lines. As has already been discussed in Chapter 3, Ingold suggests that lines can be divided into two categories, predominantly traces and threads. He acknowledges a third category which

comprises cuts, cracks, creases and folds (Ingold 2016, 44). A thread is seen as a filament and a trace is seen as a mark on the surface. Whilst the stripes are made of filaments and could be read as lines on a surface, they are neither. Perhaps they can best be described as optical lines, lines that can only be perceived because of differences in their appearance.



Figure 84 Nicola Moody, *Satin*, warp-facing side, 2023

The stripe lines of *Satin*, unlike the lines of yarn, did not exist before weaving. *Satin* has been created through the dynamic interplay of lines, and through these interactions, additional lines (stripes) were created. Applying this idea to an understanding of Ingold's meshwork suggests that the movement of lines that leads to its creation can also generate additional lines. Ingold's exploration of lines incorporates rays of light, storylines and music (Ingold 2011). Each of these is perceptible without the sense of touch. The stripe lines of *Satin* offer a way of perceiving how lines that do not require a surface are neither filaments, cuts, creases, cracks, nor folds yet can still be part of an interweaving of lines.

Chapter 5 Moving Warp

In this chapter *Moving Warp* (figure 85) is used to demonstrate that the specific environment in which lines become woven impacts the form of the work. This knowledge is used to suggest how the form of Ingold's meshwork could be impacted by the environment in which its composite lines interact. *Moving Warp* was created on a shaft loom. Like all woven structures, its form is impacted by constraints applied by the use of a loom. By removing one of these constraints, namely the reed, lines of yarn have more freedom to move and interact with each other during the weaving process. Knowledge of how and why the lines move in the creation of *Moving Warp* is used to suggest how weaving could be perceived as a process of growth.



Figure 85 Nicola Moody, *Moving Warp*, 2023

Moving Warp was composed of 430 mercerised cotton 3/2 ne warp threads. This is the same number of warp ends as used in *Satin* (Chapter 4), *Moving Weft* (Chapter 6) and *Loop* (Chapter 7). The warp threads were 4000 mm long and were attached to the ends of the warp used for *Satin* as shown in figure 86. These warp threads passed through the reed used for *Satin*. This meant that the spacing remained consistent when the warp was wrapped around the warp beam as shown in figure 87. As the weaving of *Moving Warp* neared the end, the warp threads moved outwards to correspond with where they had been attached to the warp beam. This led to a fanning out which can be seen at the bottom of figure 86.



Figure 86 Nicola Moody, *Moving Warp*, in process, 2023



Figure 87 *Moving Warp*, in process, 2023

Figure 88 shows the ends of the warp threads held within a reed. Figure 89 shows the ends of the warp threads attached to the cloth beam with the reed removed. The warp has been set up so that observations of unexpected behaviour of the lines can be attributed to the removal of the reed as opposed to the warping-up process. To accurately follow the behaviour of the warp lines in *Moving Warp*, the spacing and knots used to attach the warp to the cloth beam were replicated when they were attached to the acrylic pole as shown in figure 90.



Figure 88 *Moving Warp*, in process, 2023



Figure 89 *Moving Warp*, in process, 2023



Figure 90 Nicola Moody, *Moving Warp*, detail, 2023

The warp of *Moving Warp* was twice the length of the warp used for *Satin*, *Moving Weft* and *Loop*. This extra length meant that there was more opportunity to observe the behaviour of the lines and the impact they could have on the form of the work. To make it easier to discern how the lines of yarn were behaving white weft was used in contrast with the predominantly blue warp. Additional coloured lines of warp were incorporated at different intervals across the work as can be seen in figure 91.⁸



Figure 91 Nicola Moody, *Moving Warp*, in process, 2023

Observations

A reed is used to ensure that the warp maintains its position for the duration of weaving. Reeds are not necessary on frame looms as the length of the warp corresponds to the length of the frame. It is attached to the frame and holds its position. On shaft looms the reed also acts as the beater, pushing the weft into place. Removing the reed has an impact on both the warp and weft yarn. Using a reed causes the lines of warp to become evenly spaced. Figure 92 shows the start of *Loop*, figure 93 shows the start of *Moving Warp*. By comparing the two it is easy to see how the reed moves both lines of warp and weft into an even consistent arrangement.

⁸ White lines at each selvedge, black and white lines approximately two inches in, black, white and red lines 5 inches in and two white lines approximately 9 inches in. In addition, the centre of the warp consisted of 5 burgundy warp lines on either side of 2 black lines.

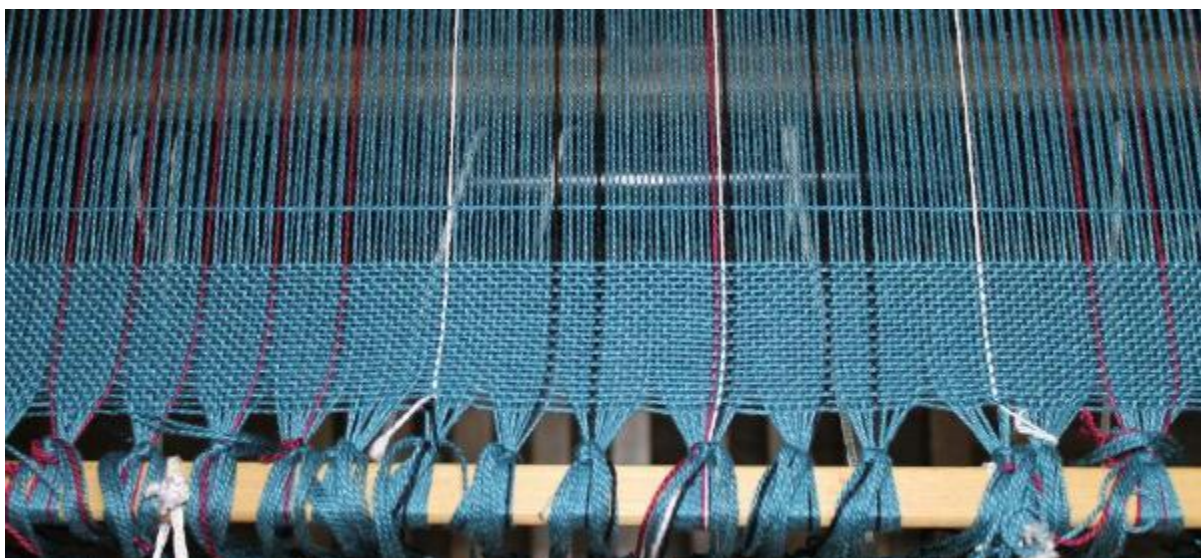


Figure 92 Nicola Moody, *Loop*, in process, 2024



Figure 93 Nicola Moody, *Moving Warp*, in process, 2023

Loop and *Moving Warp* are constructed from plain weave. This is the most basic of all weave structures, the weft passes over and under consecutive warp yarns. The EPI for each work corresponds to a balanced weave. Figure 92 shows the same number of weft and warp lines in an inch of weaving. This is not the case for *Moving Warp*. The ongoing position of the warp corresponds to where it is attached to the cloth beam. Had each line been attached, separately a consistent spacing could have been established. However, regardless of where the lines were attached – as figure 93 shows – the weft lines remain in the position they were placed by the shuttle. There are significant gaps in the weaving. The lack of a reed to beat the weft meant that *Moving Warp* was unbalanced.

In *Moving Warp* the weft was not beaten by a reed. Consequently, the curve created by passing the weft through the shed was not flattened, as shown in figure 94. Subsequent weft threads corresponded to and increased the angle of this curve. At the selvedge, the weft threads drew closer together. The returning weft looped around the external warp lines. Without a reed to keep the warp rigid, the cotton lines of warp 'give' as the looped weft moves back through the shed. Therefore, the warp threads move inwards, and the fabric narrows as shown in figure 95. The ongoing narrowing of the warp is further evidenced in figure 96 which shows the selvedge of the fabric rolled onto the cloth beam.



Figure 94 Nicola Moody, *Moving Warp*, in process, 2023

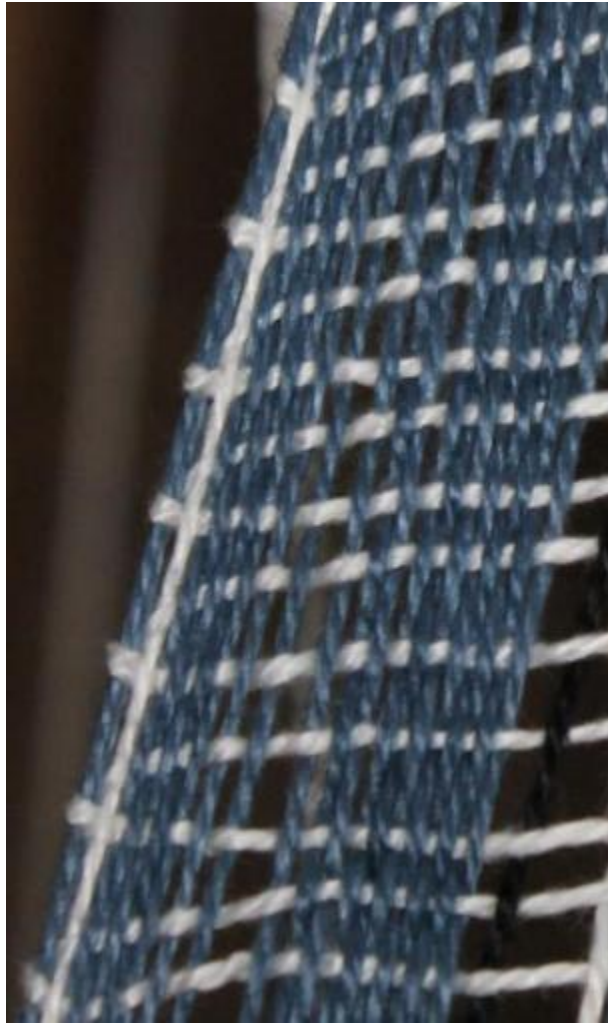


Figure 95 Nicola Moody, Moving Warp, in process, 2023



Figure 96 Nicola Moody, Moving Warp, in process, 2023

The densely packed warp lines held the weft in place. Despite not having a beater the weft became more tightly packed in these sections. In other areas, it remained looser and was not packed down. Consequently, the weaving grew at different rates. As figure 97 shows, the disparity in growth meant that the weft no longer curved but formed an angle. The ongoing movement inwards of the warp at the selvedge meant that the lines that appeared stretched in figure 97 became slack as shown in figure 98. Figure 99 shows that once off the loom the slackness of the weft was dispersed across the fabric. The warp lines are less taut and do not compress the weft to the same extent. Figures 97-99 document changes in the behaviour of these lines which can only be known through observations of the making process.



Figure 97 Nicola Moody, Moving Warp, in process, 2023



Figure 98 Nicola Moody, Moving Warp, in process, 2023



Figure 99 Nicola Moody, Moving Warp, detail, 2023

The movement of the warp lines towards each other was most noticeable at the selvedge. As these lines moved inwards, they impacted other lines. Figure 100 shows a section after approximately 3000 mm of weaving where most warp lines touch another. The more tightly packed the warp yarn the more consistent the spacing of the weft and less weft was needed to cross the warp lines.



Figure 100 Nicola Moody, Moving Warp, detail, 2023

The inconsistent movement of the warp lines across the weaving meant that there were disparities in tension. Warp that was less constrained by the surrounding warp was slacker. As the weft lines continued to engage with the warp these slack warp lines moved diagonally, looped and twisted as can be seen in figures 101 and 102. These lines often created obstructions that impacted the way the weaving could grow. Figure 103 shows how the weft had to compensate for the presence of an obstacle, a significant gap is created with its previous interaction with the warp.



Figure 101 Nicola Moody, Moving Warp, in process, 2023



Figure 102 Nicola Moody, Moving Warp, in process, 2023



Figure 103 Nicola Moody, *Moving Warp*, in process, 2023

Tension, growth, density

Tension, growth and the density of the weaving are all interlinked factors that impact the form of the work. Differences in tension impact how the weaving can grow, when and where the lines of yarn can move. Differences in the speed of growth of the weaving can impact the tension; some lines have larger gaps between points of interaction with other lines. The size of the gaps impacts the density of the weaving. Differences in the density of the weaving can lead to differences in the tension and subsequent growth of the work.

The creation of *Moving Warp* could be understood as lines responding to changes in tension, density and the speed of growth. Their behaviour causes these changes and is also impacted by them, it is a cyclical process of interaction and response. Ingold uses wayfaring as a metaphor to explain how lines behave in his meshwork. He writes that 'the task of the wayfarer, however, is not to act out a script received from predecessors but literally to negotiate a path through the world' (Ingold 2011, 162). Drawing on Ingold the lines of *Moving Warp* could also be thought of as 'negotiating' their path.

Ingold goes on to write that through wayfaring 'things are instantiated in the world as their paths of movement, not as objects located in space. They are their stories. Here it is the movement itself that counts, not the destinations' (Ingold 2011, 162). Ingold's ideas suggest

a way that *Moving Warp* can be perceived as the collective behaviour of lines; it is not seen as a product or the arrival at a destination but instead as a collection of stories. In this context, the stories are the behaviour of the lines, what they have done and why they have done it. As in the case of figures 101-103 not all the story is visible.

It could be argued that because the lines are continuing to coexist, relate and impact each other when off the loom, their stories are continuing. As with the earlier discussion of Hicks' work in Chapter 1, *Moving Warp* is not conceived as having a fixed form. As figure 104 shows the densely packed lines hold each other and the weft line in place, they maintain their rigidity. In the sections that are more open the excess weft yarn hangs loose; it may slip or be slipping at a pace that is not detectable by sight. Spaces that exist between the warp threads can provide a space for warp threads to move. The movement of these lines is impacted by how and where the work is displayed. External factors such as the wind, touching or moving of the fabric can change the way the lines respond to each other, thereby accentuating movements.



Figure 104 Nicola Moody, *Moving Warp*, detail, 2023

All weaving involves two sets of lines warp and weft. For lines to be woven some lines (the warp) must be in place first. Albers states that in weaving, warp lines are 'stationary' (Albers et al. 2017, 24). Seiler-Baldinger describes the warp as 'passive' (1992, 71). Although these terms run counter to my argument that lines in weaving should be seen as dynamic the point that they are making is that some lines need to have the propensity to hold their position to enable other lines (the weft) to move in and around them. There is a necessary order through which weaving can happen.

In *Moving Warp*, the warp lines are dependent on the loom for them to hold their position. The form of *Moving Warp* is impacted by forces applied to the lines via the loom. The loom creates the conditions through which lines can be woven. How they are attached to the loom also impacts the form of the weaving. There is no mention that the interweaving of lines in Ingold's meshwork is dependent on an external frame akin to a loom. Nevertheless, for these lines to interweave, some lines must hold their position to ensure that other lines can move over and under them.

Ingold's meshwork is composed of interwoven lines of life. These lines are likely to be different in composition and construction. It may be that, unlike lines of yarn, the composition of some of these lines is such that they hold their position without additional factors. However, Ingold is also cognisant that it is forces in the world that impact the creation of forms (Ingold 2013b, 313). The ability of a tree or a metal pole, for example, to hold its position is in part due to the conditions that have led to its creation. It is, therefore, reasonable to suggest that for lines in Ingold's meshwork to be woven environmental factors matter. These environmental factors must enable an order in which some lines are in place before others.

Applying knowledge gained from *Moving Warp* to an understanding of the behaviour of lines in Ingold's meshwork also suggests that over time, lines may gravitate towards each other. This will result in some sections of the meshwork becoming more rigid than others. The closeness of lines will restrict the movement of other lines, especially those that seek to move through them. Unless the movement of lines is consistent across the meshwork some lines will be slacker and, therefore, have a greater propensity to move and respond to other forces. Differences in movement will lead to differences in growth. Inconsistencies in growth, density and tension will all impact the overall form of the meshwork.

Chapter 6 Moving Weft

This chapter uses *Moving Weft* (figure 103) to explore how combining a fine weft with a thick warp impacts the structure of the weaving. It questions how the relationship of warp to weft can generate qualities in the fabric. Having identified specific behaviours and qualities generated through this relationship it asks what this could suggest of the behaviour of lines in Ingold's meshwork and how their interactions impact its form.



Figure 105 Nicola Moody, *Moving Weft*, 2024

Warp and weft

There are extensive combinations of warp and weft yarns that could be used in weaving, each generating different qualities. *Moving Weft* uses the same mercerised cotton yarn in two different weights 3/2 ne as warp and 30/2 ne as weft. As a result, this work is not concerned with differences in fibres but rather the ratio of thick and thin yarns. The interplay between these lines is explored through four different weave patterns: plain, twill, herringbone (also known as point twill) and satin. To make the interactions visually perceptible the weft is white the warp is black. As has already been discussed in Chapter 4, the weft hangs down beyond the section of weaving. The warp lines also extend beyond the weaving. To ensure focus is on the lines of yarn as opposed to lines used to support its display, it is hung on a acrylic pole.

The warp had an EPI of 10 which is consistent with a balanced weave. In other words, the total number of warp lines that fit side by side in an inch is 20. In halving this number, space is created within the work to be filled by the weft. If the same weft as warp is used with a plain weave structure there would also be 10 lines of weft in an inch. In the case of *Moving Weft*, there were approximately 16 lines of weft in an inch. However, due to the movement of the weft this number varies significantly. The ratio of warp to weft is called the cloth sett. The cloth sett will in part determine the characteristics of the fabric which can impact its potential uses (Richards 2021, 41).

The combining of a thick warp with a fine weft usually creates a lightweight fabric. Fabric with these properties is thought to have a good drape (Richards 2012; 2021). In the creation of *Moving Weft* the spaces were not filled by the weft as can be seen in figures 106 and 107. These gaps caused the fabric to be semi-transparent. The more gaps or spaces in a material the lighter it will be. The creation of a finer cloth means that it is less stiff. These qualities also mean it is more porous, less absorbent and more fragile.

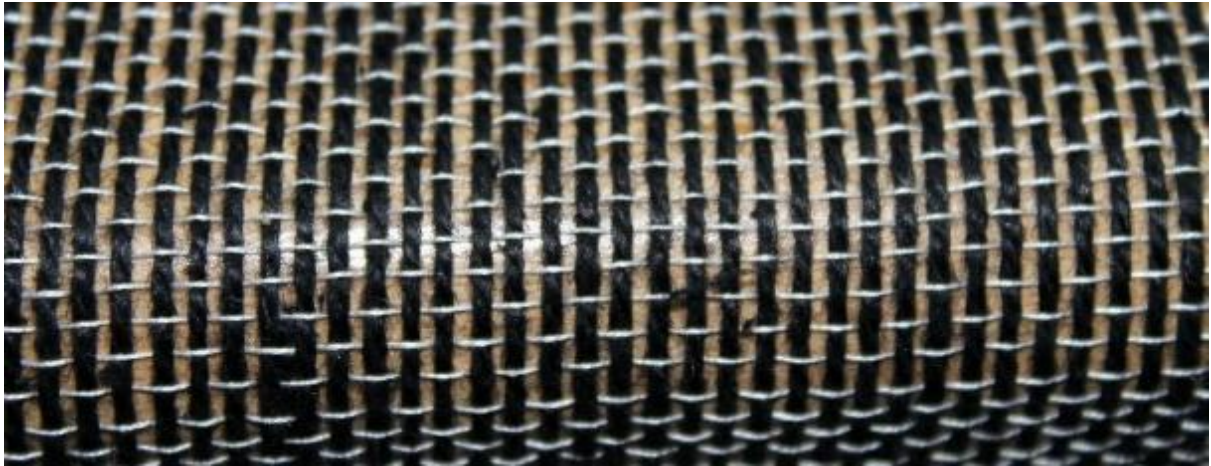


Figure 106 Nicola Moody, *Moving Weft*, in process, 2024

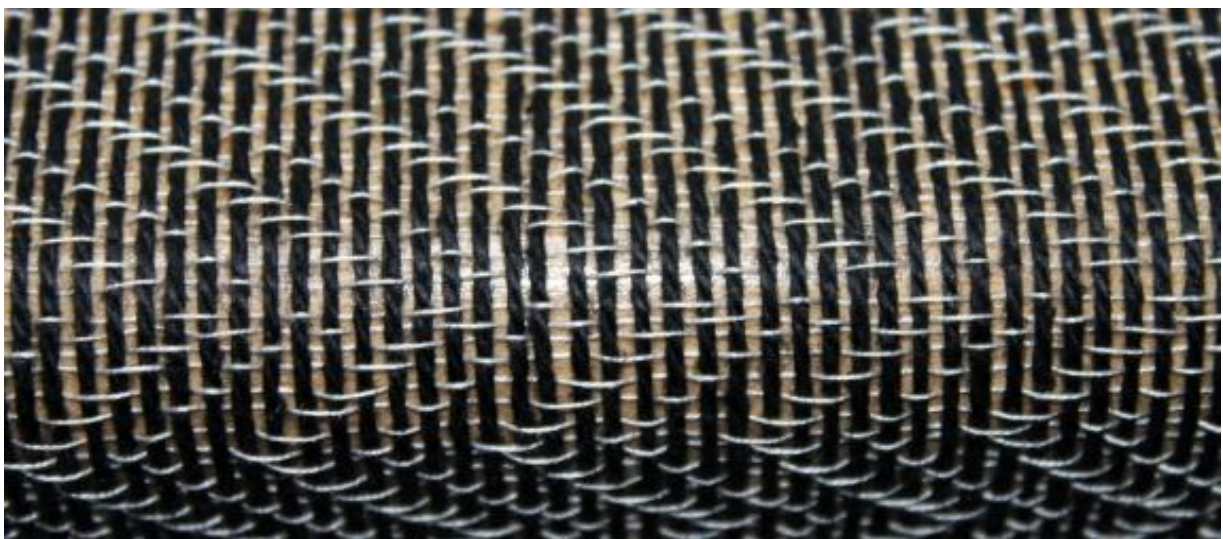


Figure 107 Nicola Moody, *Moving Weft*, in process, 2024

Figures 108-111 show the behaviour of lines in the four different weaves that form *Moving Weft*. In all cases, regardless of the number and location of interactions, the cloth sett created spaces into which the warp and weft could move. Consequently, during the weaving process, gaps between the warp and weft, warp and warp, weft and weft were inconsistent. Lines were created across the fabric where the weft had slipped down the warp. This movement was accentuated when the fabric was wound on. The warp held under tension moved through the loose interlacing of the weft. Figure 112 shows the weaving being wound onto the cloth beam. As the weaving advanced, the fabric itself was wound on which reduced the movement of warp through the weft.

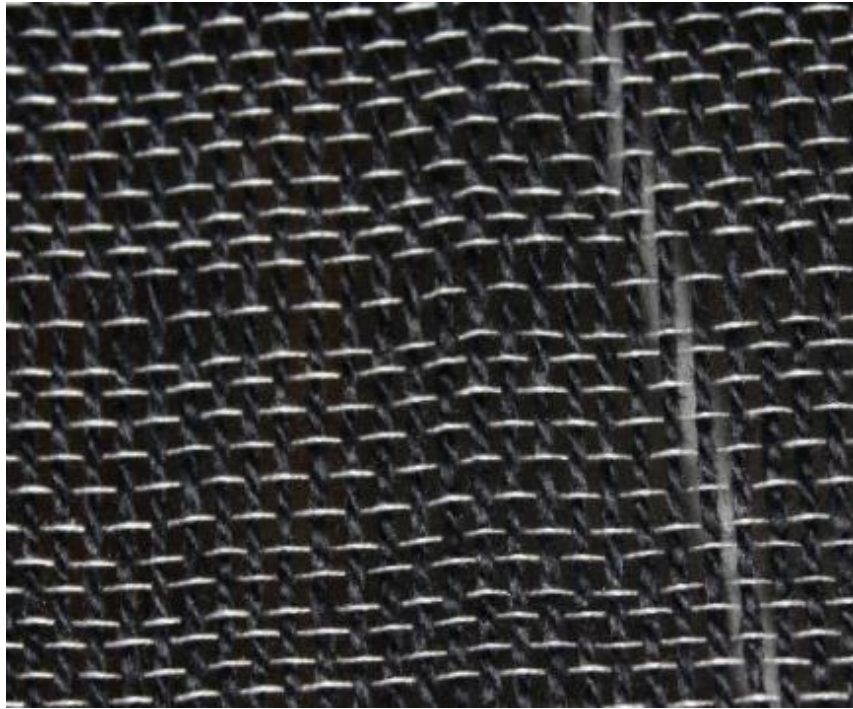


Figure 108 Nicola Moody, Moving Weft, in process, plain weave, 2024



Figure 109 Nicola Moody, Moving Weft, in process, twill weave, 2024



Figure 110 Nicola Moody, Moving Weft, in process, point twill weave, 2024



Figure 111 Nicola Moody, Moving Weft, in process, satin weave, 2024



Figure 112 Nicola Moody, Moving Weft, in process, 2024

Richards writes that when a fine weft is used with a thick warp 'the finer, more flexible weft picks are forced to bend around the warp ends' (Richards 2012, 79). Pick refers to a line of weft that runs from one selvedge to the other. Figures 113-116 show the bending of the weft in all four weave patterns. The excess space meant that the weft was not contracted by the beating of the subsequent weft. This open loose weave structure will impact its durability. Weaver Ann Ladbury writes 'no matter how strong the basic fibre, a loose, open-weave fabric will not withstand hard wear' (Ladbury 1985, 48).

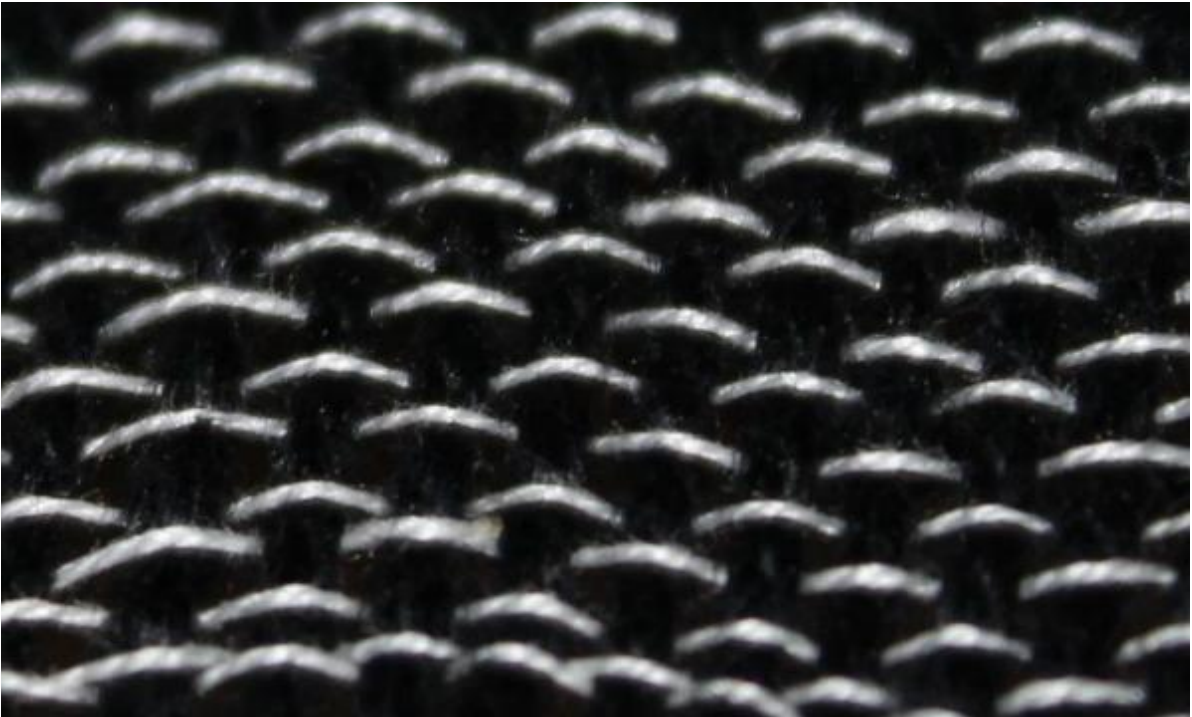


Figure 113 Nicola Moody, Moving Weft, in process, plain weave, 2024



Figure 114 Nicola Moody, Moving Weft, in process, twill weave, 2024

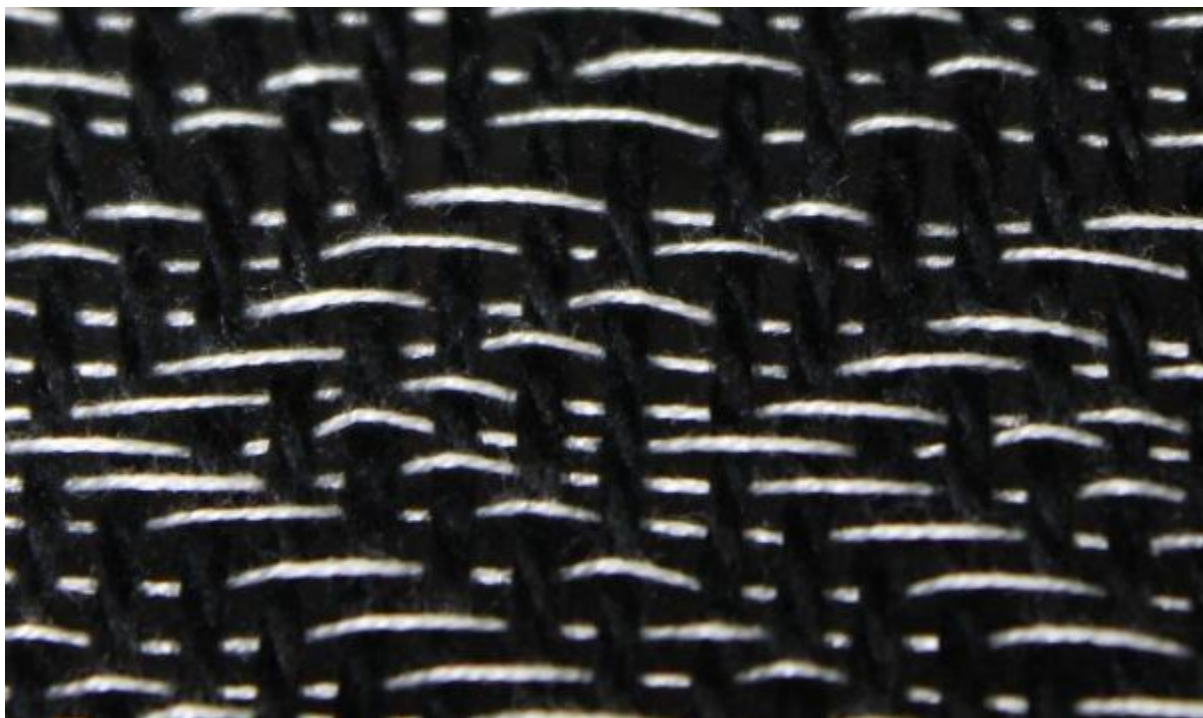


Figure 115 Nicola Moody, Moving Weft, in process, herringbone weave, 2024



Figure 116 Nicola Moody, Moving Weft, in process, satin weave, 2024

Richards also writes 'with extremely open setts, yarn movement begins to take place so freely that definite patterns become less obvious' (Richards 2012, 49). Despite the moving of the lines, there are discernible patterns in figures 113-116. However, as figures 117-120 show, the pattern becomes more inconsistent when the work is off the loom. The release of tension on the warp threads has caused additional movement within the weaving. The warps themselves, now not restricted by the reed, can move within the spaces. This is particularly noticeable at the end of the weaving shown in figure 121. Here the weft has made significant movements resulting in additional pattern inconsistencies and a weaker structure.



Figure 117 Nicola Moody, Moving Weft, plain weave, 2024



Figure 118 Nicola Moody, Moving Weft, in process, twill weave, 2024



Figure 119 Nicola Moody, Moving Weft, herringbone weave, 2024

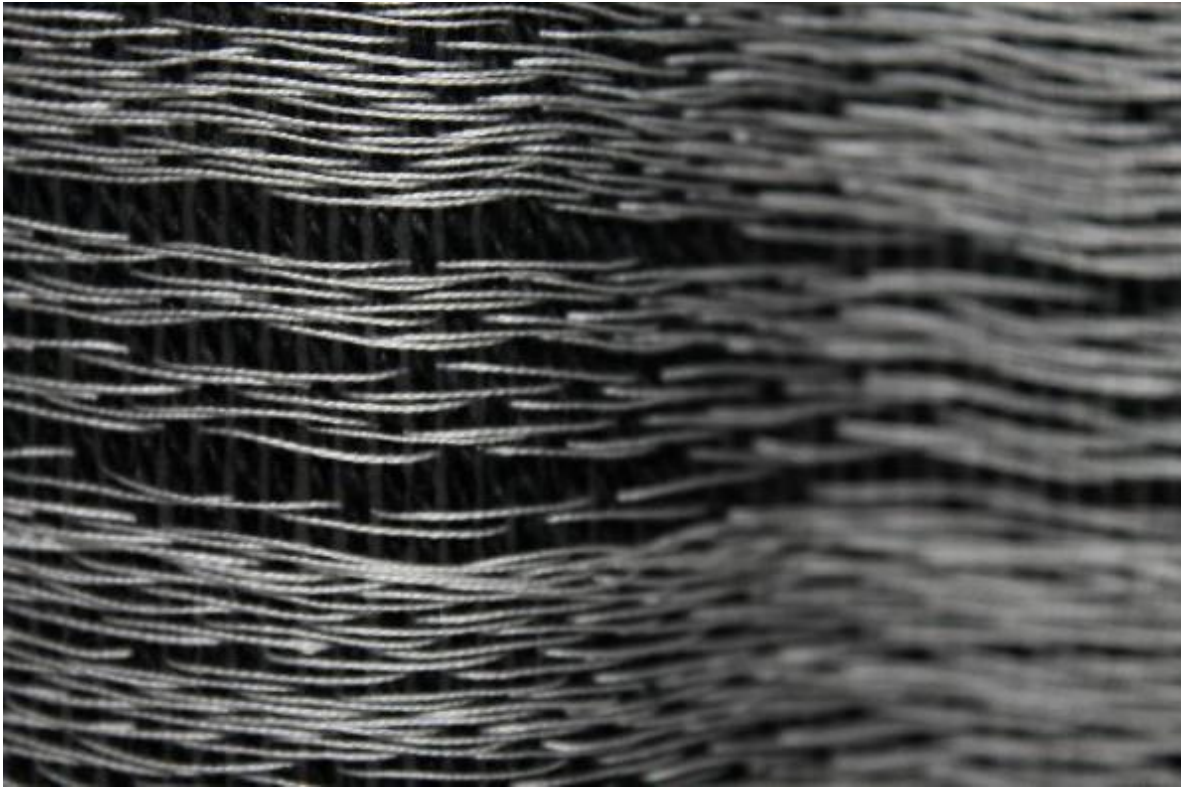


Figure 120 Nicola Moody, Moving Weft, satin weave, 2024



Figure 121 Nicola Moody, Moving Weft, detail, 2024

Movement and weather

When *Moving Weft* is off the loom the warp lines are still actively engaging with the weft lines and vice versa. Handling the work and factors such as drafts and changes in climate, could further influence the movement and interaction of these lines. The impact of these movements will be greater on the areas such as the fringe where the lines are less constrained. Figure 121 shows that the movement of the lines has impacted the cloth sett. In an inch of weaving where there are 10 warp threads, there may only be one or two weft threads. Here the weave has become more open and fragile. *Moving Weft* like Ingold's meshwork can be thought of as a site of movement and change because of the interplay of its constituent parts, namely lines of yarn.

Material scientist J.E Gordon states that 'on the whole, the more loosely the cloth is woven, the greater is likely to be the difference between its behaviour in the bias and the warp and weft' (Gordon 2009). Gordon writes that pulling a fabric on the bias generates greater distortion than pulling it in the square direction. He states that European sailmakers did not work with this knowledge. Consequently, their sails quickly became baggy and could seldom be made to set' (Gordon 2009, 49). To rectify this problem modern sails are 'cut in such a way that the weft threads are, as far as possible, parallel to the free edges of the sail, which is usually the direction of greatest stress' (Gordon 2009, 58). Gordon has provided an example of how the relationship of warp to weft can impact what happens when a fabric engages with the elements. The weave, cloth sett, choice of yarn, and knowledge of how these lines interact enable sails to be created that 'sustain pressure from the free movement of wind or water' (Gordon 2009, 6).

Ingold acknowledges that the elements, namely weather, have a role to play in how life continues in the world. He states that life lived in the open is 'to dwell within a weather-world in which every being is destined to combine wind, rain, sunshine and earth in the continuation of its own existence' (Ingold 2011, 115). For Ingold 'life lived in the open' is life in the meshwork. The meshwork, therefore, can be understood to 'dwell within a weather-world'. Ingold does not provide a detailed explanation of how his meshwork is constructed and, therefore, how it behaves in the 'weather-world'. Positioning Ingold's description of the meshwork as interwoven (Ingold 2011, xii), alongside Gordon's knowledge of weaving, the cloth sett, presentation, weave, and types of lines that compose Ingold's meshwork will all influence how it interacts with the weather.

It is likely, given Ingold's meshwork is composed of multiple lines, that they will be of different thicknesses. The diversity of the meshwork could also suggest that different parts of its

structure have different characteristics; potentially different 'weaves'. Should sections of the meshwork resemble *Moving Weft* then some parts will be porous, lightweight and loose. Conversely, should some parts resemble the construction of a sail they will be tougher, and more resilient. Lines within the sail-like section will have less diverse behaviours than sections akin to *Moving Weft*.

For Ingold weather is 'fundamental to perception' (Ingold 2011, 138). It creates the conditions in which we perceive our experiences. Applying his ideas to being on top of a hill, for example, the amount of sun, wind and rain will all alter what is experienced. How we perceive this experience can be further impacted by our location and our surroundings. Standing alone in the wind exposes us to its effects more keenly than being in a group or sheltered behind a rock.

Extending these ideas to the lines of the meshwork, understood here as organisms, their experiences 'of' and 'in' the 'weather-world' will be influenced by their level of isolation or proximity to one another. Ingold's writing on lines is extensive and whilst the meshwork is made of lines, Ingold does not provide a definitive list of which lines are involved, perhaps the assumption should be all lines. This discussion is relevant to organisms because it pertains to experience. Ingold acknowledges that to describe an organism as a 'single line presents a gross oversimplification' (Ingold 2011, 70) and that instead the lives of organisms generally extend along not one but multiple trails' (Ingold 2011, 70). Nevertheless, 'organisms and persons ... compose the meshwork' (Ingold 2011, 70). How the lines relate in the meshwork is determined by the meshwork equivalent of 'cloth sett' and 'weave'. In addition, we have seen through Gordon's writing that how fabric is handled can have an impact on its form. In the case of a sail pulling in certain directions caused it to become baggy, and impacted its future uses. The meshwork is not 'handled' in the same way as fabric. It could, however, be positioned in such a way that how it encounters the weather also impacts its form and subsequent growth.

Texture

In Chapter 4 the creation of stripes within a weaving namely, *Satin*, was discussed. In *Moving Weft* stripes are also created. These are not generated through colour differences but rather differences in weave. These stripes are shown in figure 122. The most noticeable is created by the weft-facing surface of the satin weave structure. These stripes like those in *Satin* are visually perceptible. They can also be experienced through touch, where changes in the order of interactions between warp and weft can be detected.



Figure 122 Nicola Moody, *Moving Weft*, detail, 2024

Touch is necessary to perceive the properties of the mercerised cotton yarn used for the creation of *Moving Weft*. It is also through touch that the properties of this work can be further understood. Cazeaux writes ‘the texture of the object, the pressure it exerts against the hand and the demands it makes on my hand to flex itself are not properties of the object in isolation but of how the object is greeted by a sensitive, articulate agent’ (Cazeaux 2017, 62). Cazeaux suggests properties can be understood differently according to the nature of the engagement. In the case of *Moving Weft* how it is perceived depends on the conditions in which it is seen and touched. Different properties become apparent when the fabric is felt or examined on the loom and when it is caressed, pushed, rubbed, or wrapped when off the loom.

Ingold describes ‘line’ as the ‘trail along which life is lived’ (Ingold 2011, 69) and states:

each such trail is but one strand in a tissue of trails that together comprise the texture of the lifeworld. This texture is what I mean when I speak of organisms being

constituted within a relational field. It is a field not of interconnected points but of interwoven lines; not a network but a meshwork (Ingold 2011, 69).

The 'lifeworld' or 'meshwork' is known because of its texture. The texture of the meshwork is created by lines that are also composed of lines. *Moving Weft* offers a way of understanding how lines can be formed from other lines because of distinctions in texture. Understanding a texture involves drawing comparisons. Lakoff and Johnson argue that we make sense of the world through connections and comparisons. Metaphors create new understanding because something unfamiliar is understood through something familiar. In the case of textures, for example, we understand the concept of 'rough' in relation to the concept of 'smooth'.

To understand the concept of texture is to suggest variety. Ingold's meshwork is not something attached to the world; it is the 'lifeworld'. It incorporates all growth and movement. There is no comparison to be made between the texture of the meshwork and the texture of the non-meshwork. Suggesting that the meshwork is comprehended because of its texture implies that it comprises multiple textures. To that end *Moving Weft* offers a way of comprehending how different textures can coexist.

Chapter 7 Loop

In this chapter, *Loop* (figure 123) is used to investigate how variations in the tension of the warp impact the structure of the weaving. *Loop* deliberately incorporates warp lines of inconsistent tension. Insights gained through observing yarn behaviour in *Loop* are applied to Ingold's presentation of lines to explore how these findings could enhance understanding of his meshwork. Observations of the behaviour of the lines that compose *Loop* are also used to support an understanding of weaving as the dynamic interplay of lines.



Figure 123 Nicola Moody, *Loop*, 2024

Loop is made from the same yarn as *Satin*, *Moving Warp* and the warp of *Moving Weft*, namely 3/2 ne mercerised cotton. The weft is a teal colour as is most of the warp. Additional lines of white, black and red yarn are also used as warp and are set with tensions differing from the majority of teal warp lines, as can be seen in figure 124. The different colours of these lines draw attention to their specific behaviours. A few teal lines are of a different tension to the majority; this enables a comparison of the impact of colour on the perception of the behaviour of the lines.

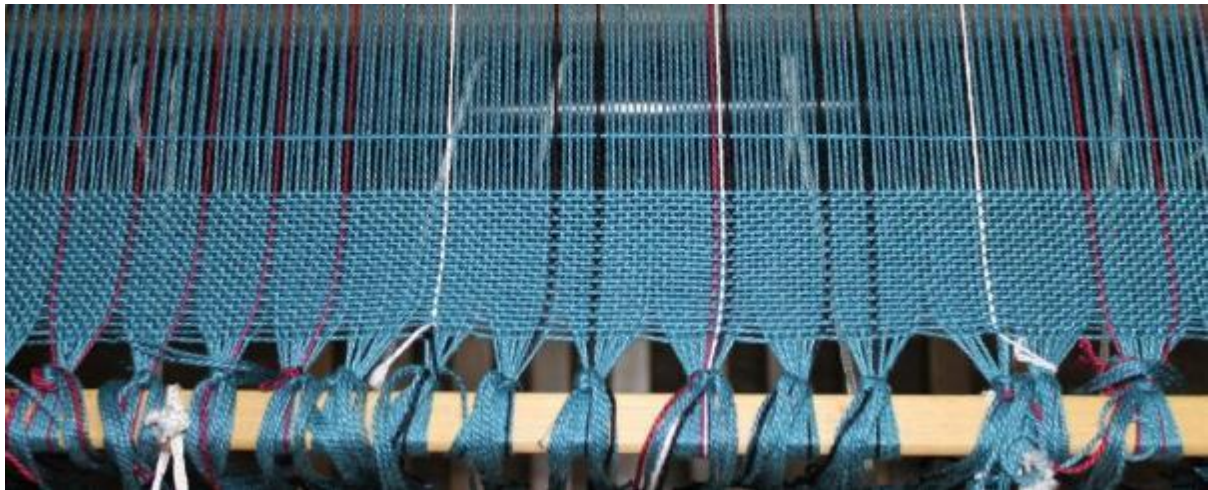


Figure 124 Nicola Moody, *Loop*, in process, 2024

Inconsistent tension

To create inconsistencies in the tension of the warp two strategies were used. Firstly, several warp lines were attached to a separate warp beam. The tension of these lines could be operated separately from the majority of the warp. Figure 125 shows the two warp beams one with teal yarn wrapped around it and the other with several lines of red, black and white yarn. Lines on the additional warp beam were of unequal length. This meant that when these lines were wound on some lines became tauter than others. The second approach was to attach some lines to milk bottles containing varying amounts of water. This created different weights as shown in figure 126. Pulling on lines of yarn creates tension, the amount that the lines are pulled impacts their behaviour. Pulling the yarn causes its fibres to compress and line up which means they are less free to move in other directions.



Figure 125 Nicola Moody, Loop, in process, showing the two warp beams, 2024



Figure 126 Nicola Moody, Loop, in progress, weighted milk bottles applying different amounts of tension to yarn, 2024

In weaving, the warp lines are parallel to each other. Even tension causes them to maintain their position throughout the weaving. In *Loop* when the tension of the warp was inconsistent the looser yarn could move within the traditional format. Figure 127 shows red lines and one teal line of warp not running parallel with the surrounding warp. These lines had the propensity to curve and traverse over other warp lines.

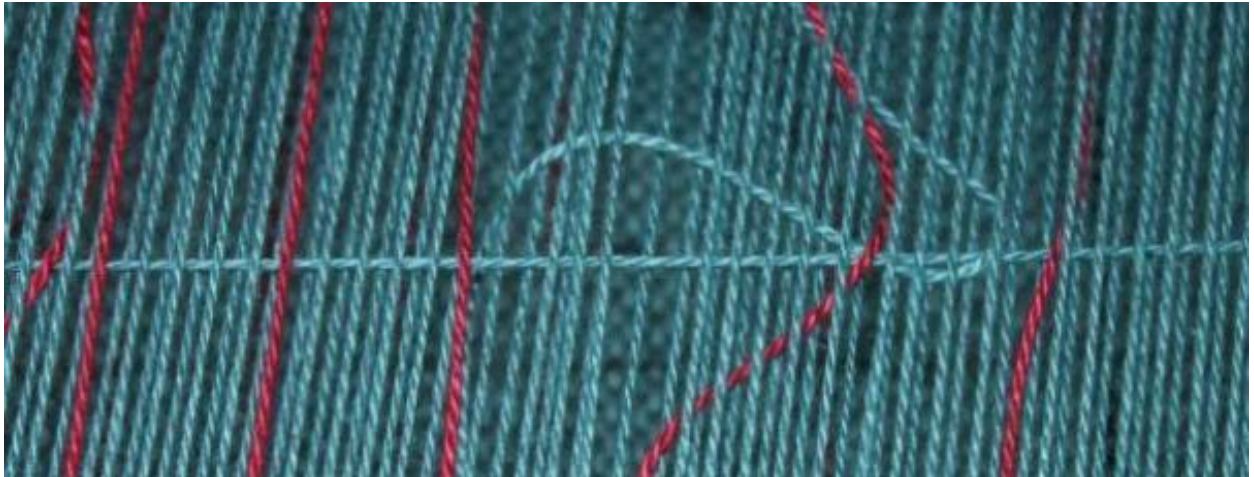


Figure 127 Nicola Moody, Loop, in process, 2024

On occasion, the weft lines also moved the warp lines through the shed. Figure 128 shows that due to the excess length of a white warp line, it is pulled and moves perpendicular to the warp, along the same course as the weft. Consequently, this line interacts with the warp lines that it runs parallel to, the weft line that intersects it, and twenty-one additional warp lines. The line of white warp shown in figure 128 can be understood to transition from warp to weft and back to warp. This line does not conform to the traditional roles associated with weaving in which warp lines are parallel and weft lines intersect at right angles. Artist and researcher Ellen Harlizius-Klück writes that in the history of using a loom ‘to control a weave meant to decide whether a warp thread was to be picked up or not’ (Harlizius-Klück 2017, 179). The control that a weaver can impose on the warp comes because they are taut and attached to the loom. The slackness of the white line in figure 128 and the red lines in figure 127 allow these lines to have greater agency. They are part of the weaving, and their behaviour is influenced by the actions of the weaver. However, their behaviour is not controlled and predictable.

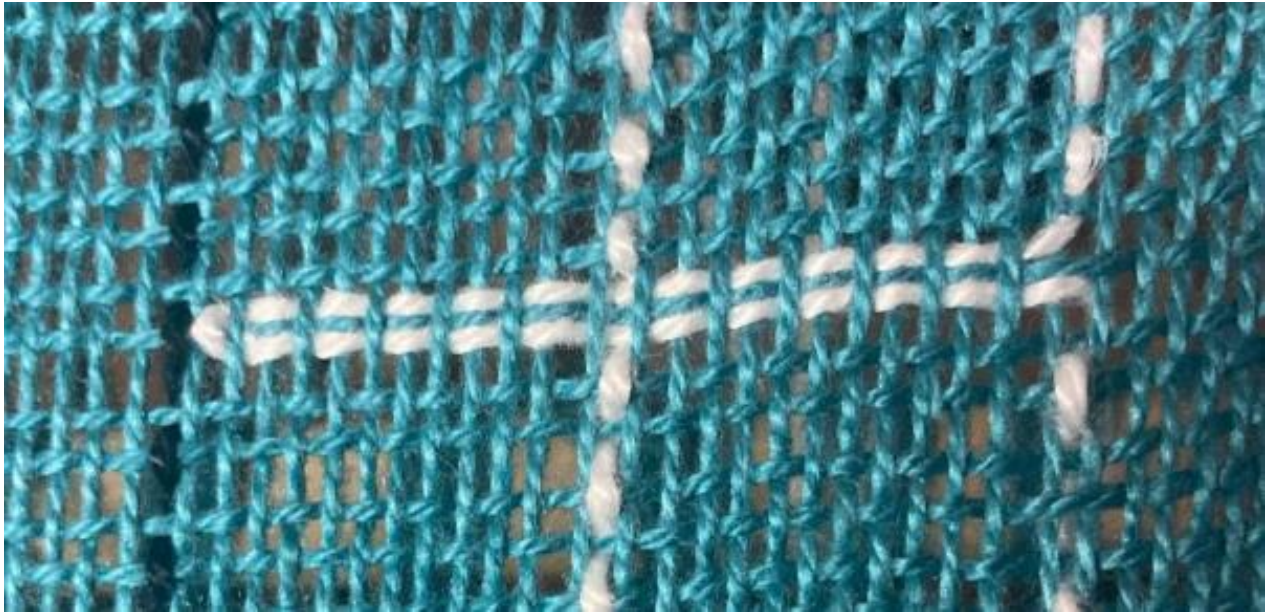


Figure 128 Nicola Moody, *Loop*, in process, 2024

The uneven tension of the warp meant that the height to which the lines of yarn could be raised was inconsistent. Lines with more slack and length hung lower in the shed. Consequently, the shed was not clear as shown in figure 129. This has the potential as was evidenced in *Moving Warp* and discussed in Chapter 5 to create obstructions which can impact the structure of the weave, the form of the work, and the ability of weaving to continue.

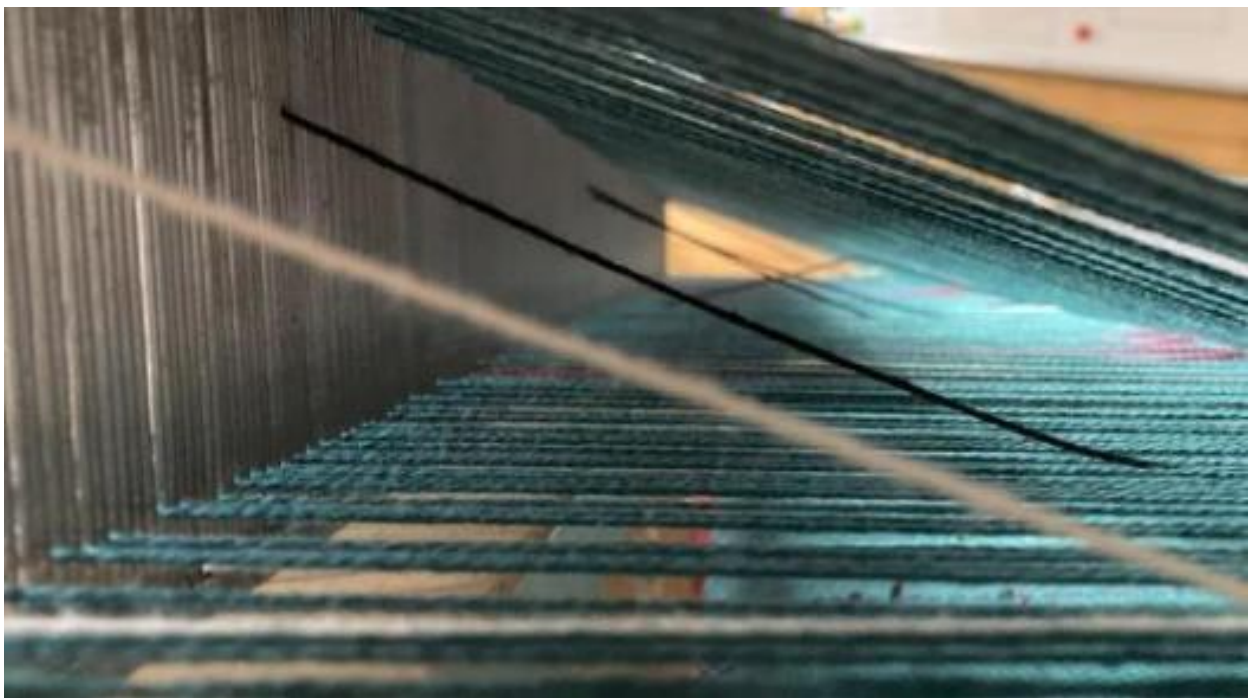


Figure 129 Nicola Moody, *Loop*, in process, 2024

In *Loop* when the weft passed through the shed it often scooped up the excess warp. As a result, loops were created on the surfaces of *Loop* as shown in figure 130. This sometimes

occurred on both surfaces (figure 131). The sections of the line that stuck out in the forming of a loop were more exposed. The extent to which they were unprotected by the surrounding yarn was in part determined by the amount of yarn that was scooped up. Sometimes consecutive loops appeared, on other occasions one large loop was created as shown in figure 132.

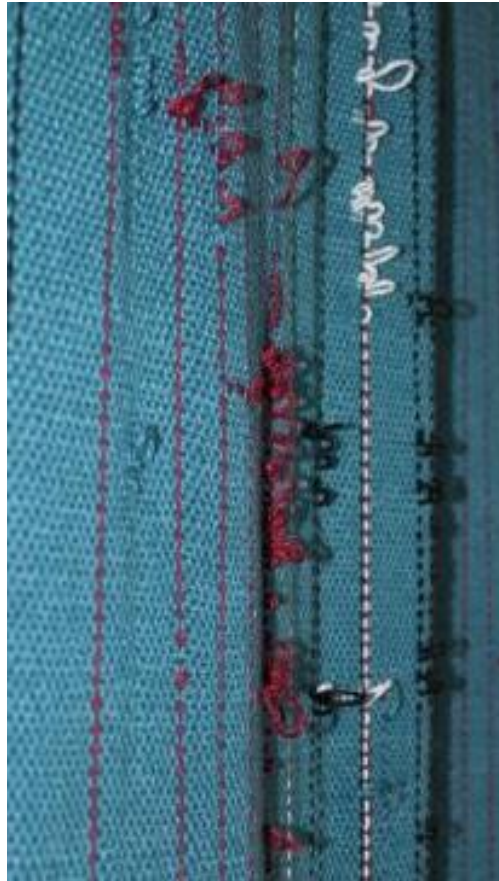


Figure 130 Nicola Moody, Loop, detail, 2024



Figure 131 Nicola Moody, Loop, in process, 2024



Figure 132 Nicola Moody, *Loop, in process*, 2024

Place and time

In places, the slightly raised warp resembled embroidery stitches (figure 133). This emphasises the notion that weaving is a collection of small units or interactions - individual coming together, that over time form a surface. The work of Chiyoko Tanaka (discussed in Chapter 1) uses the accumulation of singular interactions that lead to the systematic growth of weaving as a way of marking time. Textile researcher Lesley Millar states that many artists use time in their work as a means to explore 'the intensity of their personal responses to the ideas surrounding it' (Millar et al. 2002, 8). For Tanaka, the build-up of weft on warp acts as 'the locus of time' (Millar et al. 2002, 8).

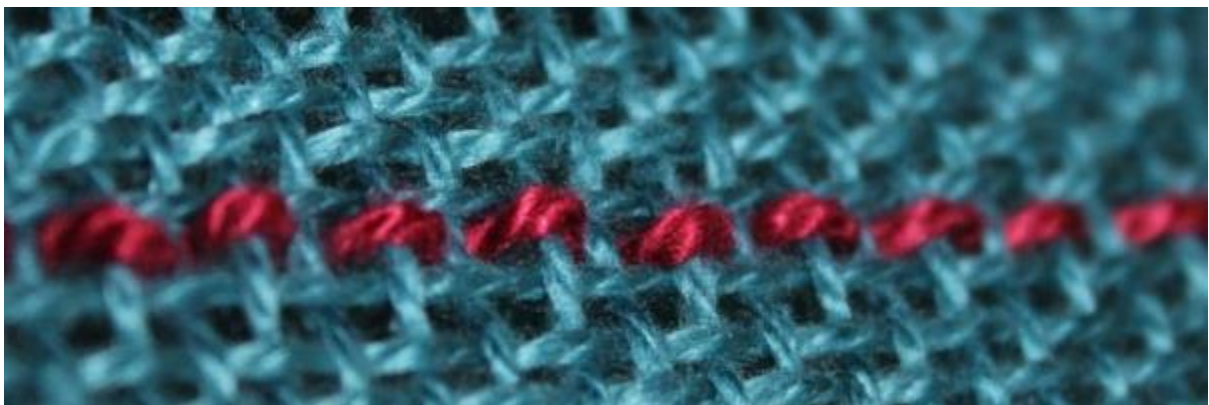


Figure 133 Nicola Moody, *Loop, in process*, 2024

As has also been discussed in chapter 1, researchers Berggren Torell and Ranglin recognise the connection between weaving and time. In their research project *Knowledge in action in weaving* they describe a weaver's response to a question stating that 'with a

phenomenological wording' they described the feeling of weaving 'as "being there" – being in the weave: "You are in it! I am here," she said and pointed at the threads in front of the loom' (BerggrenTorell and Ranglin 2014, 34). Weaving understood in these contexts could be seen as establishing a location - placemaking. It is through the activity that the place is created.

Ingold presents us with the concept of 'place' not as a bounded location but as a coming together of paths along which life is lived. A place is not seen as a demarcated area with clear boundaries, or a stopping point, but as a gathering of paths. He defines these paths as 'lines' and the 'place' that they make through their relations as 'meshwork.' Therefore, 'place' can be understood as an ever-evolving site of activity, growth, and movement (Ingold 2011). It grows and develops through, and in response to, the interweaving of these paths.

As discussed in the introduction, Ingold aims in his presentation of line to undo the notion of 'inversion' (Ingold 2011, 63) that he believes is 'deeply sedimented within the canons of western thought' (Ingold 2011, 68). He explains that the logic of this inversion 'places occupation before habitation, movement across before movement through, surface before medium' (Ingold 2011, 73). He argues that life does not occupy space separate from other life, but all life exists and continues because of its openness to the world.

Applying Ingold's concept of 'inversion' to weaving makes sense in the context of weaving used as a noun. 'Weaving' used as a noun refers to a shape with sides, an object that is seen as complete. The lines from which the weaving is composed are no longer thought of as separate but are collectively the weaving. Viewing 'weaving' as a verb undoes this inversion. Weaving is seen as a site of activity. The lines from which the weaving is composed are seen as distinct, each has a role. The weaving is known because of what is going on inside. The 'logic of inversion' also presents weaving as a surface. In the case of fine art, weaving is often used as the support onto which paint is applied. Seeing weaving as a site of activity in its own right is to recognise that things are happening in it. As is the case in *Loop*, the behaviour of the lines of yarn is the subject matter.

Albers writes that 'matière' is a term used to refer to the surface quality of material (Albers et al. 2017, 45). She argues that it is the 'medium of the artist' (Albers et al. 2017, 45) because it is concerned with appearance. She states that in weaving, knowledge of the 'matière' is not enough. Weavers require knowledge of the inner qualities of the materials. These inner qualities determine how lines of yarn behave. To understand a weaving, such as *Loop*, is to recognise it as a response to the dynamic interaction of lines, not as a unified surface.

Change as movement

Ingold's assertion that things are moving and growing comes from an understanding of the world in a constant state of flux. Materials are impacted by their environments and, therefore, change. In the case of weaving this change can be understood as 'wear and tear.' Some artists, such as Chiyoko Tanaka, deliberately use the connection and speed at which textiles can be broken down. Tanaka uses her 'grinding' technique, discussed in chapter 1, to speed up the erosion of fabric (figure 134 and 135). In so doing her work creates holes that expose the warp and weft.

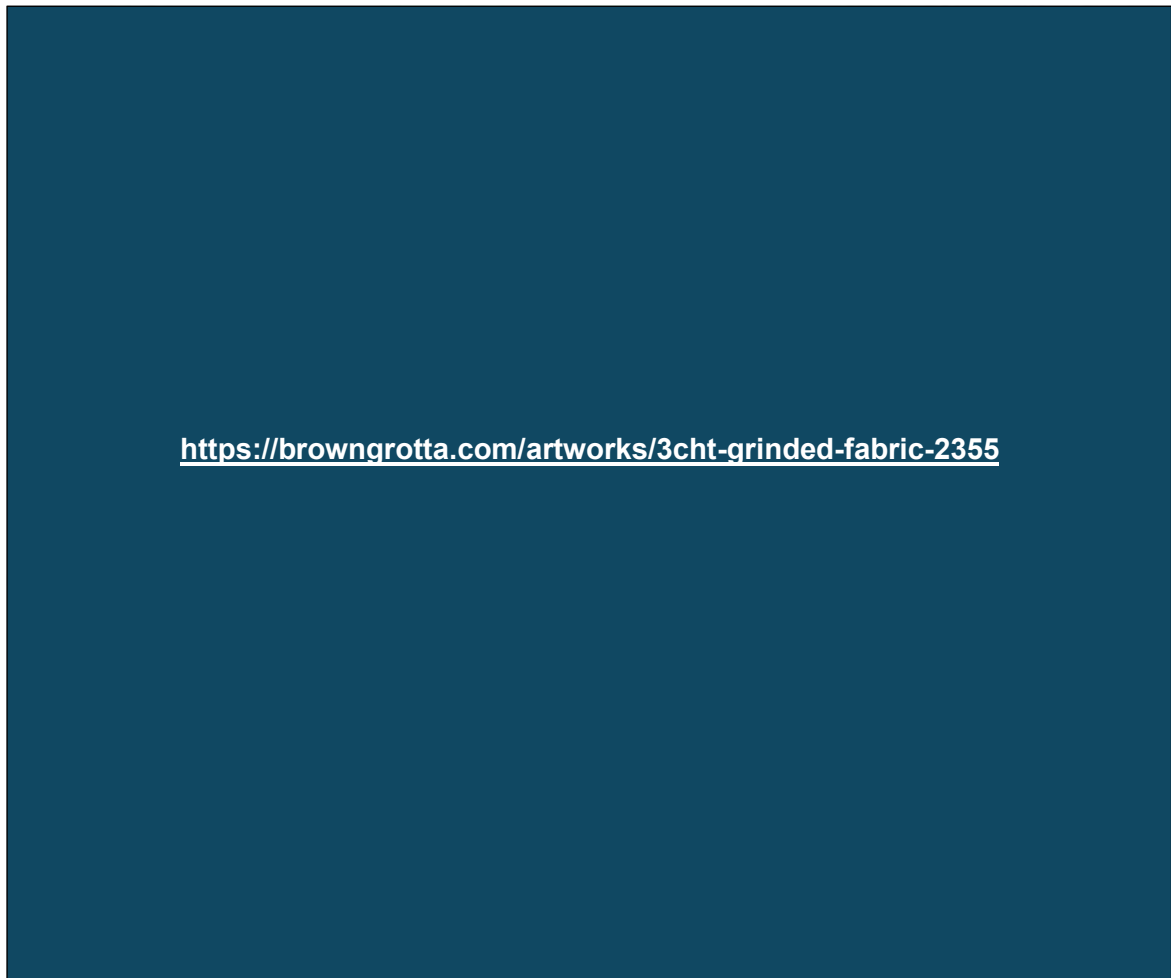


Figure 134 Chiyoko Tanaka, Grinded fabric #2355, 1988

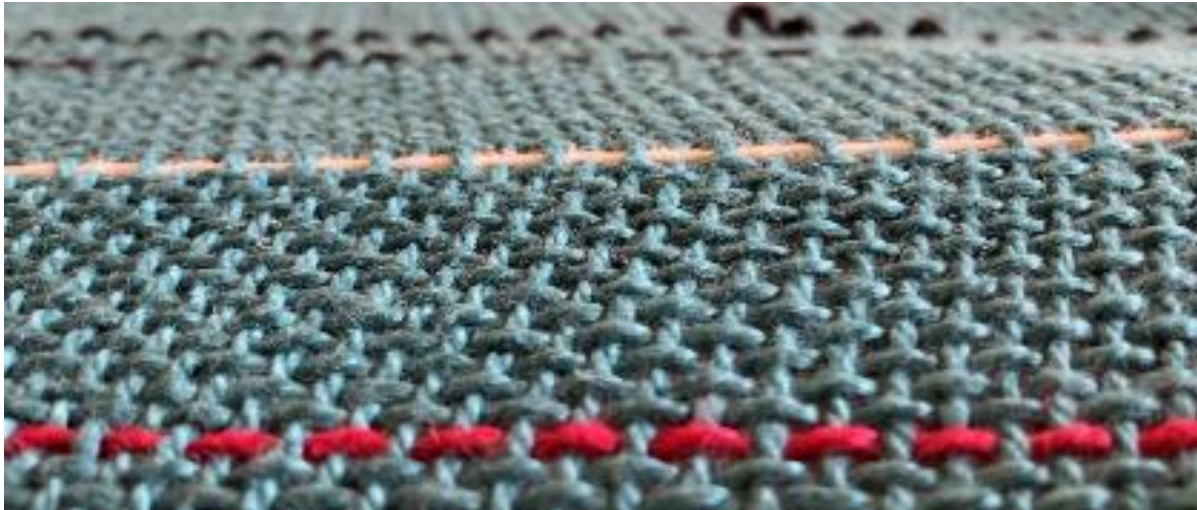
<https://browngrotta.com/artworks/3cht-grinded-fabric-2355>

Figure 135 Chiyoko Tanaka, *Grinded fabric* #2355, detail, 1988

All change occurs because of environmental factors in the broadest sense. As with other fabrics, change can occur in *Loop* through wear and tear and the movement of the weft at the selvedge, understood as fabric fraying. The presence of loops in *Loop* also means that an additional movement can occur. By pulling on a line of warp that contains loops the slack allows the line of yarn to move through the weft. Lines without slack can also be pulled. However, they will not move as freely, and a greater degree of force will be needed. I have created two short film clips to illustrate these points. In the first, the black looped line is pulled through the weft and the loops disappear. On the second the white warp line within *Loop* is pulled. The white line is already flat, pulling this line has a greater impact on the form of the surrounding fabric. At the end of both interventions, the black line and the white line are both flat, however, the white line has become narrower as the fibres are further compressed.



<https://vimeo.com/942731923?share=copy>



<https://vimeo.com/942735608?share=copy>

Loop has offered a way of understanding how environmental factors can impact change within a weaving. It has also suggested how lines involved in weaving can behave as warp and weft. It demonstrates that lines do not require the same level of tension in the warp to still become woven. Taking this knowledge and applying it to Ingold's meshwork offers a way of understanding how lines can relate to other lines beyond those that lie next to them or over them. Lines in the meshwork that can behave as warp and weft require additional length and slack. For these lines to behave in the manner suggested in *Loop*, additional lines are required to support them. In other words, when other lines conform to the traditional role of warp, maintaining tension and straightness, they can mitigate the inconsistencies of slacker lines, allowing them to have more diverse interactions.

Traditional weaving knowledge suggests that some lines of yarn are more suitable for warp than others. As explored in 'Material choice' found in the appendix, mercerised cotton yarn is deemed to be tough and therefore a good choice for a warp. In *Loop*, the mercerised cotton was used for all the warp and weft. The toughness necessary for the taut warp was not necessary for the slack warp. The slack lines could have been composed of weaker yarn and could still have a role as warp. Applying this idea to Ingold's meshwork composed of interwoven lines would suggest that not all the lines that behave as warp need to be of equal toughness. This implies that some lines have a significant role in supporting weaker lines. If these lines are understood to be lines of life, then it would suggest that some life has a crucial role in supporting the behaviour of weaker life.

Chapter 8 Curl

In this chapter *Curl* (figure 136) is used to explore how the processes lines of yarn have been through prior to weaving can impact the woven structure. This chapter asks what *Curl* can offer to an understanding of Ingold's meshwork. It also asks how *Curl* can be used to support an understanding of weaving as the dynamic interplay of lines. *Curl* builds on observations made in the creation of woven samples, discussed in Chapter 2, in which a fine yarn is used as warp with a thicker plied yarn as weft.



Figure 136 Nicola Moody, *Curl*, 2024

Curl is created using two different yarns. The warp is composed of 30/2 ne mercerised cotton. The weft is composed of three plied strands of 3/2 ne mercerised cotton. The weft

was hand-plied on a spinning wheel. It combines two strands of white yarn and one strand of black yarn. The layout of the weave is similar to the layout used for the samples, discussed in Chapter 3. It contains a solid black line of weft approximately one-quarter of the way across the weaving. It also has a section of repeated lines of predominant white weft and lines of black weft, roughly in the middle of the work. In addition, the warp contained black, grey and red lines of yarn. Using a similar layout to that of the samples enables a comparison of how the scale of the work can impact the behaviour of the lines. *Curl* is approximately 1000 mm by 1000 mm and uses a point-twill weave. When the work was on the loom the fabric was spaced by the reed; it remained flat as can be shown in figure 137. When off the loom two corners curled under, two over (figure 136).

Twist as a force

The process of plying strands of yarn together adds a twist to the yarn. The twist puts the strands under greater strain. It causes the fibres in the strands to compress further and strengthens the yarn (Miller 1995). Energy is imparted to the yarn through twisting. As an inexperienced spinner the amount of twist given to the yarn was inconsistent. Where the yarn was over-twisted it sought to release this energy by twisting in the opposite direction as shown in figure 137.



Figure 137 Nicola Moody, *Curl*, in process, 2024



Figure 138 Nicola Moody, 3x 3/2 ne mercerised cotton yarn prior to weaving, 2024

When yarn is threaded through as weft on the loom, the twist evidenced in figure 138 was straightened out. However, the energy of that twist still exists within the weaving. It is this twist that is dispersed across the fabric. The twist within individual lines of yarn was collectively applied to the fabric, causing the fabric to move. Richards and Ingold both use zoologist D'Arcy Wentworth Thompson's book *On Growth and Form* to explore how things are made. Thompson describes the form of an object as 'a diagram of forces' (Thompson 2021, 11). He argues that 'force is the appropriate term for our conception of the causes by which these forms and changes of form are brought about' (Thompson 2021, 11). The form of *Curl* is a response to the movement of the lines of yarn caused by the force applied through the twisting of the yarn.

The 30/2 ne mercerised cotton warp lines are composed of two plied strands. The strands are formed from cotton fibres spun in one direction. A single strand is, therefore, understood to be unbalanced (Richards 2012, 18). Folding one strand and allowing it to twist back upon itself creating a 2-ply yarn causes a reduction in the stress of the fibres. This yarn can then be thought of as balanced. A similar principle is followed in manufactured 2-ply yarns such as the one used as the warp for *Curl*. Richards, explains that manufactured yarns are probably not truly balanced because the amount of twist applied is unlikely to equate to natural twist (Richards 2012, 18). In the case of *Curl* what matters is that the warp lines

contain less energy than the lines of weft. They are softer as the fibres are less compressed and when not attached to the loom they lie loosely at the fringe as shown in figure 139.



Figure 139 Nicola Moody, *Curl*, detail, 2024

Figure 140 (a photograph of *Moving Weft*) shows the interplay of the two types of yarn used in the creation of *Curl*. Both are composed of the same fibres, both are 2-ply. The only difference other than colour is the weight of the yarn. Here the finer yarn 30/2 ne is used as weft and the thicker 3/2 ne yarn is used as warp. As figure 140 shows the behaviour of the 3/2 ne lines at the fringe is similar to the 30/2 ne warp lines of *Curl* shown in figure 139, they hang or lie loosely.

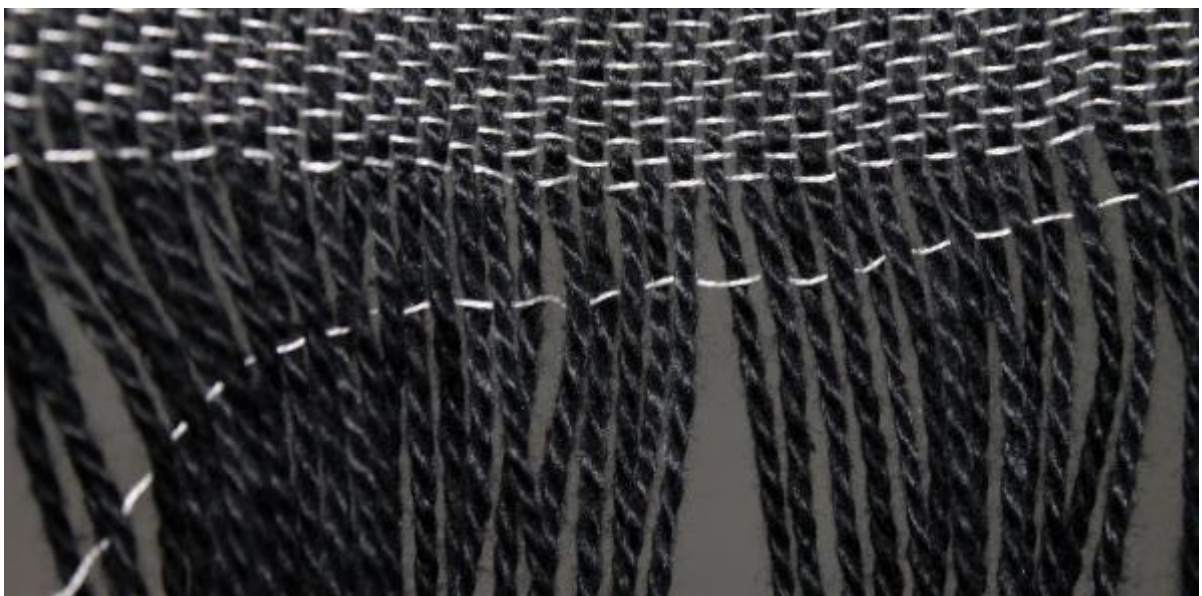


Figure 140 Nicola Moody, *Moving Weft*, detail, 2024

Richards writes, 'intrinsic properties of the various fibres will inevitably be modified by techniques of fibre preparation and spinning' (Richards 2021, 22). In *Curl*, the weft can be described as 3 x 3/2 ne because three of the thicker strands have been twisted together; this yarn is unbalanced. Additional energy has been imparted to these lines. Energy held in the weft impinges on the behaviour of the warp. The force that the plied lines contain impacts the structure of the weaving. Figure 141 shows how the less active lines of warp are forced to curl through the release of energy in the weft lines. The form of *Curl* is, using Thompson's description, a diagram of the forces that these lines have undergone.



Figure 141 Nicola Moody, *Curl*, detail, 2024

The properties of the warp and weft yarns used in *Curl* come in part from the fibres from which they are composed but also from the processes and forces that they have encountered. In some sections of *Curl* inconsistencies in my spinning meant that the yarn was twisted significantly more than in others. As a result, it became thicker and stiffer as can be seen by the predominantly white weft-raised line shown in figure 142. In addition, sometimes a larger length of a 3/2 ne strand was scooped up in a twist. This caused wider

sections of yarn, which appeared as raised areas in the weaving, as can be seen in figure 143.



Figure 142 Nicola Moody, *Curl*, detail, 2024

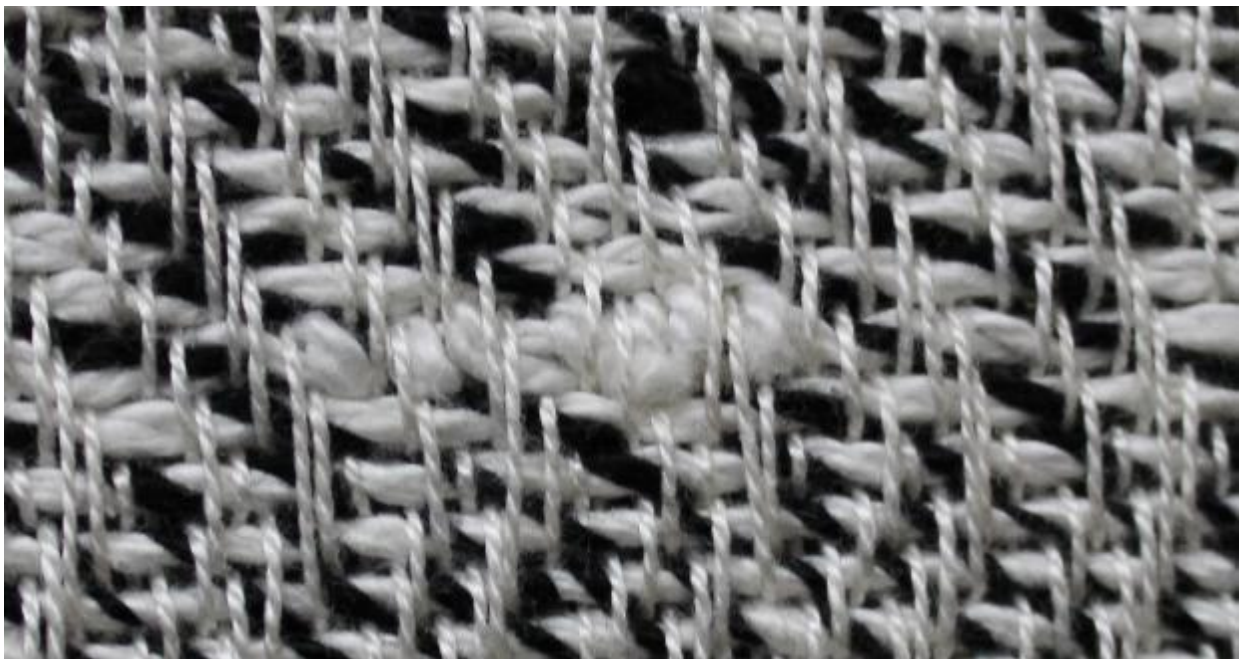


Figure 143 Nicola Moody, *Curl*, detail, 2024

Interplay of forces

Curl demonstrates how lines continue to move within a woven structure. What is created on the loom comes because of the relationship of lines of yarn. These lines continue to relate and interact once they are off the loom. In the case of works discussed in previous chapters such as *Satin* in Chapter 4 or *Loop* in Chapter 7 weaving continues when they are off the loom through the continued interaction of the lines. This is also the case for *Curl*. However, the disparity in energy between the lines of warp and weft means that the ongoing ‘weaving’

of the lines has a more dramatic impact on the form of the work. Figure 144 shows *Curl* on the loom; the fabric is evenly wound up on the cloth beam. In this position, the energy within the yarn is held steady by the loom. Once off the loom, this energy is released as shown in figure 136.



Figure 144 Nicola Moody, *Curl*, in process, 2024

Ingold claims that in the world ‘action is not the result of an agency that is distributed around the network but rather emerges from the interplay of forces that are conducted along the lines of the meshwork’ (Ingold 2011, 64). Ingold suggests action and, therefore, movement of lines in the meshwork does not occur because of an external force applied to lines but forces generated through and along the interaction of the lines. In the case of *Curl* the form of the work comes from the relationship of the lines to each other. Its form has not been imposed by an external force. As figure 138 has shown a line of weft used in *Curl* will behave differently when in isolation. In *Curl* the force within the line meets forces within other lines (many of which are less pronounced) generating *Curls*’ specific form.

Ingold argues that ‘life is lived along lines’ (Ingold 2011, 4), that ‘lines comprise the meshwork’ (Ingold 2017b, 9) and that ‘life is a meshwork’ (Ingold 2017a, 35). He states that lives are lived in the open as opposed to within closed groups. He writes ‘lives are social not because they are framed but because they are entwined. All life is social in this sense, since it is fundamentally multi-stranded, an intertwining of many lines running concurrently’ (Ingold 2011, 221). Ingold explores the meshwork through the notion of entwined strands. *Curl* is composed of entwined strands. Cotton fibres can be seen as small lines intertwined to create a longer line – a strand. This line has intertwined with other lines to create a stronger line – two strands plied to create either the 30/2 ne yarn or the 3/2 ne yarn. Three strands of

the latter line are then intertwined to create a stronger, thicker line – three strands of 3/2 ne yarn plied together.

Thompson writes ‘the form, then, of any portion of matter, whether it be living or dead, and the changes of form which are apparent in its movements and in its growth, may in all cases alike be described as due to the action of force’ (Thompson 2021, 11). *Curl* is not just the result of forces applied to lines through the action of weaving. It is the result of different forces at different stages on the fundamental matter from which it is composed, namely cotton fibres. Applying this to Ingold’s meshwork suggests that the ability of the meshwork to move and grow comes not just from the relationships and interplay of forces in the construction of the meshwork. Rather, it also comes from the prior interplay of forces that have led to the existence of the lines.

To properly understand Ingold’s meshwork it is necessary to explore how the lines have been created. If these lines are as Ingold suggests composed through prior entwining, then the meshwork does not commence at the point that lines become interwoven but instead at the point that lines become lines. The very point at which forces interact with matter. The type of line is determined in part by the matter from which it is composed but also by the type of force that has enabled it to change and therefore move. The structure of the meshwork is also in part determined by the type of lines.

A conventional understanding of weaving suggests that it only grows at the point at which the weft thread is introduced to the warp. The dynamism of Ingold’s meshwork could resemble the creation of *Curl* where movement and change occur across the woven structure. *Curl* offers a way of understanding how changes in environmental structures (removal from the loom) can prompt additional behaviours. It also offers a way of understanding how the movement of one line can have ramifications for many others.

In *Moving Warp* (discussed in Chapter 5) and *Loop* (discussed in Chapter 7) it was the warp lines that were seen as more vital to the form of the work. In the case of *Curl* it is the properties of the weft that have dominated the warp. The notion of some lines in weaving being ‘stationary’ (Albers et al. 2017, 24) or ‘passive’ (Seiler-Baldinger 1992, 71) is useful in understanding the distinct roles of warp and weft. However, this is unhelpful for an understanding of weaving. Richards writes ‘no fibre or yarn is “passive” in an ultimate sense, since they all impart some physical characteristic to the finished fabric’ (Richards 2012, 56). As Thompson argues all form comes about because of the interplay of forces on matter (Thompson 2021, 10). A weaving is not simply matter or an object, it exists because of inherent forces that are active in the ongoing maintenance of its form, an idea exemplified in *Curl*.

Chapter 9 Materials

In this chapter *Materials* (figure 144) is used to explore the behaviour of different materials in a specific set of circumstances. Five sets of twenty-one different types of yarn of even length were attached to an acrylic pole, these act as warp. Twenty-one lines of the same yarn of equal lengths were woven in as weft using plain weave. This chapter explores what the creation of *Materials* can offer to an understanding of Ingold's meshwork and how it can also be used to explore the notion that weaving is dynamic at every stage of the process.



Figure 145 Nicola Moody, *Materials*, 2024

Materials is composed of a selection of yarns - manmade and natural. The manmade yarns are acrylic wool, polyester thread, and monofilament. The natural yarns can be split into two categories, plant fibres (cotton, raffia, flax, linen) and animal fibres (wool, mohair and silk). The following yarns were used, listed in an order that corresponds to where they were attached to the pole.

- | | |
|---|------------------|
| 1. Cotton: 3 different weights | 9. Wool |
| 2. Mercerised cotton: 3 different weights | 10. T-shirt yarn |
| 3. Raffia | 11. Monofilament |
| 4. Mulberry silk | 12. Rug wool |
| 5. Raw silk | 13. Flax |
| 6. Lace weight silk | 14. Linen |
| 7. Acrylic wool: 2 weights | 15. Polyester |
| 8. Mohair | 16. Paper |

All the yarn was measured by wrapping it around a warping frame to a length of 2400 mm as can be seen in figure 146 and figure 147. These yarns were attached to an acrylic pole by passing the yarn through a knotted loop, as shown in figure 148. This led to slight differences in the 'take up' of the yarn. Additional differences in 'take-up' also occurred when the other end was knotted to secure the nuts as seen in figure 149.



Figure 146 Nicola Moody, *Materials*, in process, 2024



Figure 147 Nicola Moody, Materials, in process, 2024



Figure 148 Nicola Moody, Materials, detail, 2024

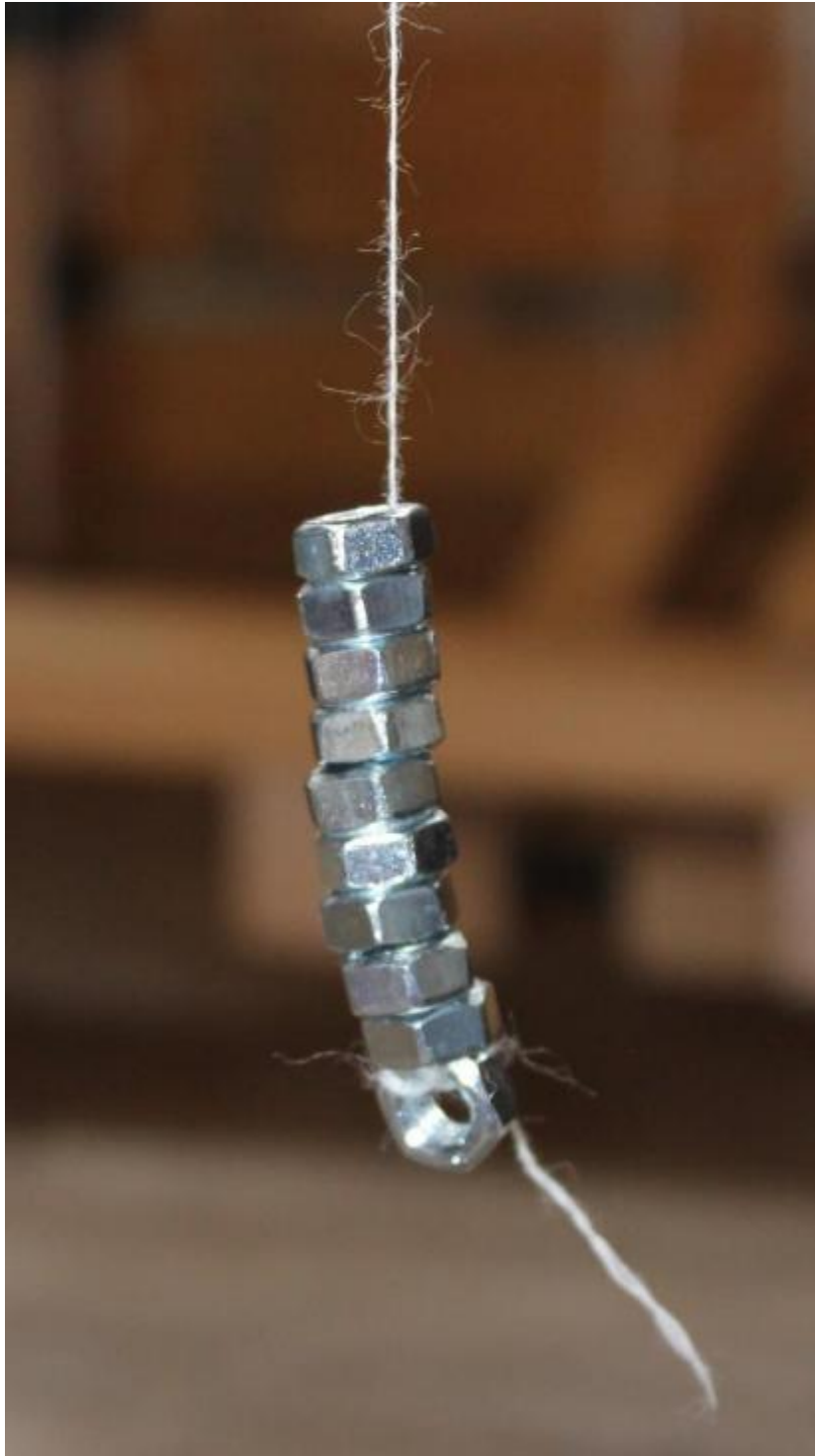


Figure 149 Nicola Moody, Materials, detail, 2024

Weight applied to materials

To cause some of the lines of yarn to become straight, weights were attached to the end of the yarn. Manufactured nuts were used to ensure consistency. One group of twenty-one different types of yarn had twelve nuts attached (figure 150), the next group had nine nuts (figure 151), an additional group had six nuts (figure 152), and another group had three nuts (figure 153). In the final group, the yarn hung without nuts attached (figure 154).



Figure 150 Nicola Moody, Materials, detail, 2024



Figure 151 Nicola Moody, Materials, detail, 2024



Figure 152 Nicola Moody, Materials, detail, 2024

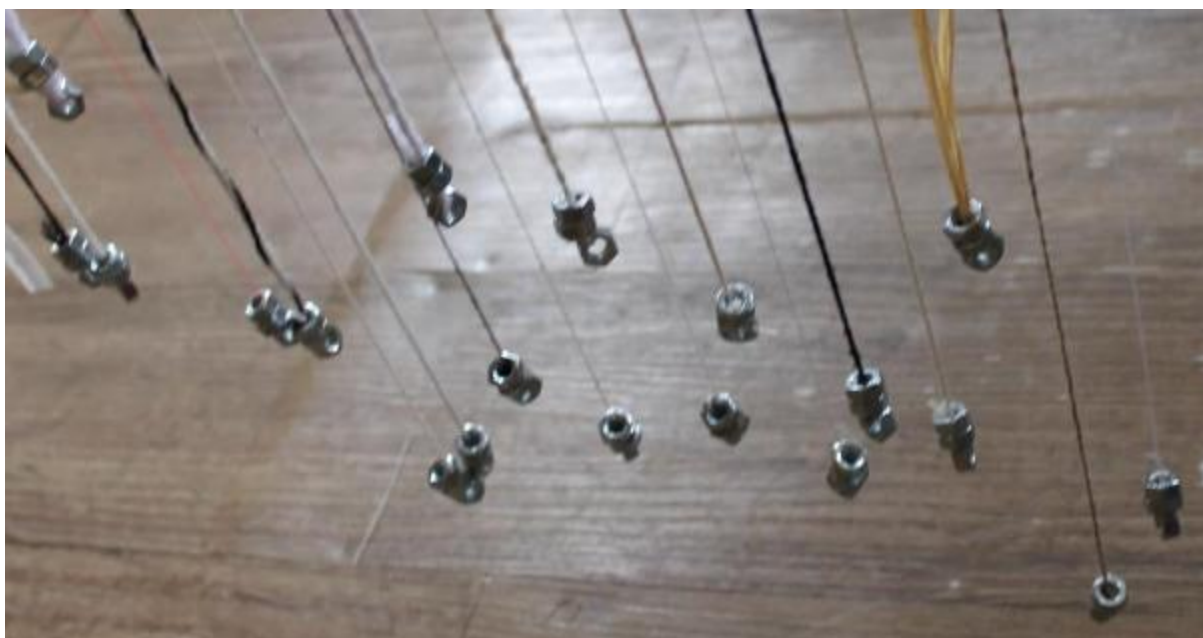


Figure 153 Nicola Moody, Materials, detail, 2024.



Figure 154 Nicola Moody, Materials, detail, 2024

The weights added different amounts of tension to the groups of yarn. In some cases, the weight was too much, and the yarn snapped as can be seen in the nuts lying on the left of the photograph shown in figure 152. In other cases, the fibres in the yarn moved and the line became longer and thinner. The weights eventually rested on the floor, alleviating the weight this line had to carry, as shown on the right of figure 155.



Figure 155 Nicola Moody, Materials, detail, 2024

The snapped line is composed of one strand of cotton. The lack of ply means that it is weaker. The line that stretched is composed of mohair. This yarn is known for its softness. Although it is 4 ply and, therefore, had been twisted the angle of twist is obtuse, consequently the fibres were able to slide over each other. The behaviour of these yarns is in response to the application of tension. Using a loom would have generated similar responses. Some lines are more suitable for warp on a loom. Textile technologist Edward Miller states that 'it will be found that in many woven cloths the warp yarns are firm, compact and strong, and the weft yarns are softer twisted and more lofty in texture' (Miller 1995, 70).

Materials, demonstrates that weaker lines of yarn can still be used as warp, as long as they are not pulled and, therefore, put under stress. Where the lines were not held under tension a more open weave is created as seen in figure 156. Here the warp on the right is unweighted and the warp on the left is weighted with 3 nuts. The warp lines on the right can move more freely in response to changes in the environment, consequently, the weave is less stable. Applying this to an understanding of Ingold's meshwork suggests that regardless of a line's strength it is still possible for it to become interwoven as warp and weft. It also implies that where weaker lines act as warp in the meshwork, the structure of this section will be more fragile and potentially more dynamic.



Figure 156 Nicola Moody, *Materials*, detail, 2024

In *Materials* approximately 3000 mm of each yarn is woven in as weft. The size of the woven sections is influenced by several factors. A comparison of figure 157 to figure 158 demonstrates that a finer yarn generates a smaller section of weaving. The ability of the yarn to grip can also generate distinct differences in the size of the woven section. Figure 159 shows that the monofilament thread expanded and moved down the warp threads after it was woven in.



Figure 157 Nicola Moody, Materials, detail, 2024



Figure 158 Nicola Moody, Materials, detail, 2024



Figure 159 Nicola Moody, Materials, detail, 2024

The location of the weaving in relation to the acrylic pole also impacts the compactness of the weave. Figure 160 shows weaving close to the pole. The warp yarn is more rigid the closer it is to the acrylic. The angle at which it can move away from the pole is reduced, consequently, the weft yarn is held in place more securely by the warp. These observations support assertions made in 'Material choice' found in the appendix that the properties of a yarn impact the structure of what is woven. Applying these ideas to Ingold's meshwork implies that what lines are used where, will impact the structure and, therefore, the density, strength and movement within this form.



Figure 160 Nicola Moody, *Materials*, detail, 2024

Materials differs from other artworks created for this investigation because it incorporates different yarns side by side, enabling a direct comparison of their behaviour. In addition, the warp lines are only attached to a pole at one end, as a result, they have greater freedom to move. Even though all the yarns were equally measured on the warp frame they behaved very differently when suspended from the pole. Figure 161 shows the different heights of the yarn with 6 nuts attached. Yarns such as fine polyester thread and raw silk hang much lower than yarn made from an old t-shirt, paper and raffia.



Figure 161 Nicola Moody, *Materials*, detail, 2024

In *Materials*, the warp can move and swing, consequently, the movement of the weft is also less constricted. Once the initial weft yarn was introduced, it was easier to insert successive yarn. The weft imparted a degree of rigidity to the warp, restricting its movements and

making it easier to insert another line of weft. Increasing the sections that were woven impacted the movement of both warp and weft.

Ingold's meshwork is organically moving and growing. Therefore, interactions occur at different times. As the creation of *Materials* suggests the more lines that are incorporated the more rigid the structure becomes. Rigidity suggests a reduction in movement. Ingold's meshwork is, however, a site of activity, of life. For it to grow and still be able to move means that it is either continuously expanding, enabling additional lines to become interwoven, or some lines must fall away making room for other lines. The latter is perhaps best understood as the 'circle of life' in which lines of life take over when other lines of life die.

Space

Applying weights to the lines of yarn leads them to behave akin to plumb lines; a way of creating a straight line in space as a measuring device. Textile researcher Victoria Mitchell writes 'thread, beginning as a line drawn out as matter through the action of spinning, serves as a medium through which sight and space is measured, drawn and "framed"' (Mitchell 2006, 341). A thread line can connect points and is used to measure three-dimensional space. Mitchell likens this process to an 'incision' (Mitchell 2006, 345). Her use of the word 'incision' implies that 'space' is something to be cut, this suggests it has substance and is a 'thing.' Using this notion the lines of *Materials* can also be thought of as an 'incision' into a 'thing' that already exists.

The 'thing' that *Materials* divides or is inserted into is three-dimensional space. In this context 'space' is not thought of as 'no-thing' but 'some-thing.' Areas that could be perceived as connected, the complete space, are now split into strips of space as shown in figure 162 or rectangles using warp and weft as shown in figure 163. The position of these lines creates viewfinders through which to perceive the 'space.' Art critic John Berger writes 'we only see what we look at. To look is an active choice... We never look at just one thing; we're always looking at the relationship between things and ourselves' (Berger 1972, 8-9). The lines of yarn of *Materials* frame what is seen. Not only do we see the lines of yarn in relation to each other, but we also see what is beyond them. We comprehend the space through the relationship of these 'things.'



Figure 162 Nicola Moody, *Materials*, detail, 2024



Figure 163 Nicola Moody, *Materials*, detail, 2024

It could be argued that *Materials* links space; a line of yarn travels from the acrylic pole to the floor, in so doing it establishes a connection. This physical presence of the yarn connects different parts of the space. Mitchell sees the stretching of a line of yarn in space as a means of establishing order; it can provide an organised 'perception of space' (Mitchell 2006, 345). In short, through dividing and linking space *Materials* influences how the space it occupies, and the surrounding area is understood.

Ingold argues against the notion of space. He writes "Space," for me, signifies absence rather than co-presence' (Ingold 2011, 247). Ingold asserts that a view of 'space' as 'nothing'

means that 'space' is lifeless. He suggests that perceiving space in this way is like perceiving the world as 'occupied but not inhabited ... filled with existing things rather than woven from the strands of their coming-into-being' (Ingold 2011, 145). An understanding of 'space' as empty suggests that there are parts of the world that are not relational. For Ingold, the world is 'meshworked' composed of lines of life that are formed and form through their relationships (Ingold 2011, 63). The notion of 'space,' therefore, has no place in his meshwork.

However, for me, space is a productive, generative concept. I would argue that *Materials* actually supports an understanding of 'space' as an area where things are still happening but cannot be seen. For example, the straightness and length of the lines of yarn that hang as warp are impacted by the weight attached to them. The nuts, used as weights, are not pulling on the yarn themselves. The pull comes from the impact of gravity upon the nuts. Unattached to the yarn the nuts would not hover in space but would fall to the floor. So, too would the yarn had it not been attached to the acrylic pole. Gravity cannot be seen; it is present in the 'space.' Through the introduction of *Materials* to that 'space' it can be perceived through its effect on the yarn.

My position is not so different from Ingold. His proposition of the 'lifeworld' (Ingold 2011, 142) supports the idea that things are happening in every aspect of the world. Whilst I am happy to refer to the area around things as 'space,' Ingold states 'I just cannot get out of my head the idea of space as a void, as non-world, as absence rather than co-presence' (Ingold 2011, 142). For me, 'space' is an essential part of weaving. Distinct lines move over and under each other. No matter how close the weave, it will always have gaps between the lines. To speak of the 'space' between lines helps to identify the existence of a line. Whilst we cannot visually perceive the 'space,' we know it exists. Because of the space, we know when one line ends and another starts. In this context, 'space' has a role; it is not devoid of meaning and is a vital component of weaving.

Using weaving as a means through which the interaction of lines is understood requires the use of the term 'space.' Without 'space,' there would be nowhere for the lines to move. Lines that cannot move are static; as such, they cannot be thought to change and grow. This notion runs counter to Ingold's assertions about lines of life. Understanding 'weaving' without an understanding of the role of space in its creation means that 'weaving' is perceived as the layering or positioning of lines in such a way that a homogeneous whole is created. There is no distinction between the lines. Understanding Ingold's meshwork as a weaving without a notion of 'space' would mean that rather than being composed of distinct lines of interrelating life the meshwork would become the merging and blending of all life into one.

Using Ingold's understanding of 'space,' the gaps between the lines of *Materials* would be thought of as empty voids. Using my understanding of the term, 'space' is thought of as part of the work. 'Space' enables distinctions to be made between the lines that compose *Materials*. Forces that exist in the space also impact the lines. It is understandable that once my physical involvement with the work has ceased *Materials* could be viewed as an 'object,' a product of my interactions. This, however, negates the involvement of the space, forces, and interplay of properties that also impact the form of *Materials*. I contest that it is, therefore, more accurate to view *Materials* as the ongoing collective behaviour of lines in 'space.' How this work behaves in the 'space' of my studio will differ from when it is in the 'space' of a gallery. The work is not static. It exists because of the continued interactions of the lines within 'space.'

Chapter 10 Ever-Evolving

Ever-Evolving (figure 164) was created to explore Ingold's assertion that lines in his meshwork are part of an ever-evolving weave (Ingold 2011, 120). It is possible to conceive that a weaving can be ever-evolving because of an endless supply of lines. Such a weaving would grow in length as more weft is added to an endless warp. It could also grow in width as additional warp lines are incorporated into the weave. *Ever-Evolving*, however, is used to explore how a weaving can also grow in depth. It builds on ideas discussed in Chapter 3 in which *Samples* is used to explore Ingold's understanding of 'thread' and 'trace' lines and the relationship between them. Ingold writes, 'traces are transformed into threads in the dissolution of surfaces and ... threads are transformed into traces in their constitution' (Ingold 2010b, 11). The transformation of threads to traces and vice versa is explored in *Ever-Evolving*. Weaving is seen as the creation of a 'thread' line, which can in turn become part of another weaving, within this role, it is seen as a 'trace' line.

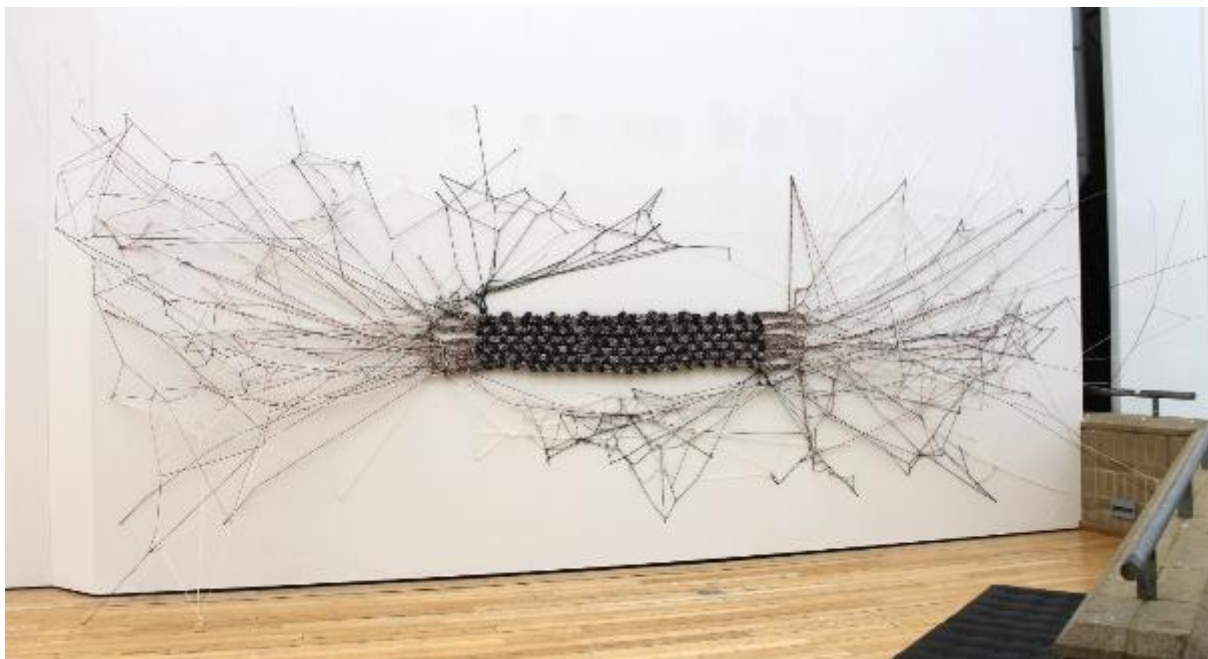


Figure 164 Nicola Moody, *Ever-Evolving*, 2024

In this chapter, knowledge generated through the behaviour of lines in *Ever-Evolving* is used to offer an understanding of potential behaviours in Ingold's meshwork. Insights gained through *Ever-Evolving* are also used to support an understanding of weaving as the dynamic interplay of lines. *Ever-Evolving* contains three iterations of weaving. Firstly, lines of yarn are woven together creating a thicker line (figure 165). These thicker lines are then woven

together, creating an even thicker line (figure 166). These thicker lines are woven together, creating a much larger line (figure 167).



Figure 165 Nicola Moody, Ever-Evolving, in process, 2024



Figure 166 Nicola Moody, Ever-Evolving, in process, 2024



Figure 167 Nicola Moody, Ever-Evolving, detail, 2024

Lines within lines

Ever-Evolving has been made from cotton yarn. One line of cotton yarn, shown on the left of figure 168, is composed of many lines. It is described as 4-ply and yet each strand that has been plied together is composed of nine smaller strands as can be seen in figure 168. It is, therefore, more accurate to state that this yarn is composed of 32 strands. Although *Ever-Evolving* began with the manipulation of a cotton line of yarn, lines had intersected prior to this point. The relationship between these lines is maintained through twisting them together. The cotton fibres were spun together to form strands. Nine of these strands have been plied together, and four of these thicker strands are subsequently also plied together.



Figure 168 Nicola Moody, *Ever-Evolving*, in process, 2024

Lines involved in *Ever-Evolving* relate to each other through processes of twisting and weaving. Lines must come together with other lines to enable them to grow. This understanding of *Ever-Evolving* suggests, using Ingold, that it should be thought of as a 'thing' rather than an 'object.' Ingold writes 'the thing about things if you will, is that far from standing before us as a *fait accompli*, complete in itself, each is a 'going on'—or better, a place where several goings on' (Ingold 2010b, 96). *Ever-Evolving* as a 'thing' should not be thought of as static but as a site of 'several goings on.'

To accentuate the relationships between the strands, cotton yarn, and subsequent iterations of weaving, lines of yarn were unravelled and dispersed around the edge of *Ever-Evolving*, as can be seen in figures 168 and 169. This layout resembles the behaviour of tree roots, rhizomes or mycelium in that multiple lines converge at certain points giving rise to different formations such as fungi, vegetables or trees.

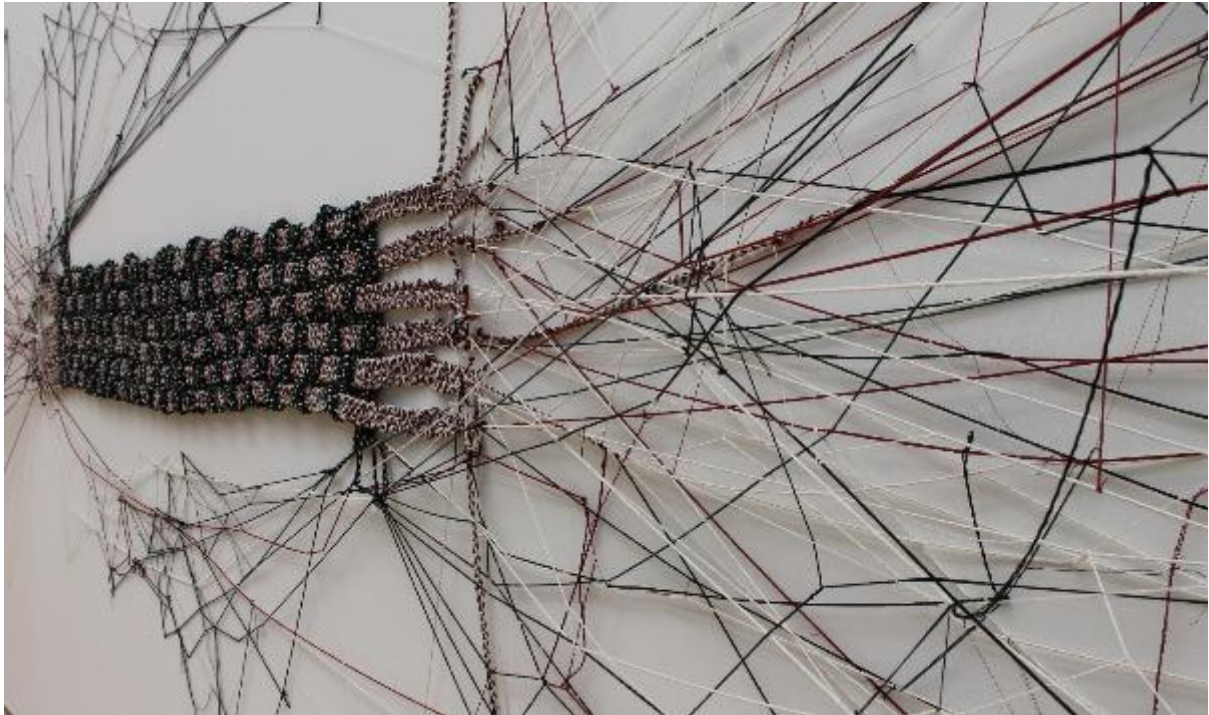


Figure 169 Nicola Moody, *Ever-Evolving*, detail, 2024



Figure 170 Nicola Moody, *Ever-Evolving*, detail, 2024

Ingold uses rhizomes and mycelium as metaphors to explain the relational nature of 'life'.⁹ He writes that it doesn't matter which analogy is used to explain how life grows but 'what is crucial is that we start from the fluid character of the life process, wherein boundaries are sustained only thanks to the flow of materials across them' (Ingold 2010a, 12). What matters to Ingold is that life, perceived as a line, is understood because of its engagements within a world of materials. A thing is identifiable because of boundaries. A boundary, in this context, could be described as the place where materials meet and interact.

Exploring this idea further, it could be argued that a human is a bounded form; contained within their skin. Ingold, however, asserts that humans are continually engaging with other materials, oxygen, sun, rain, and the ground (Ingold 2011, 88). Like all forms of life, humans exist because of the movement of materials. Ingold does not depict organisms as shapes in which the ends of a line join but instead as dispersed lines as shown in figure 171, my copy of Ingold's illustration. In this way, he seeks to illustrate his understanding that life is not inside a bounded form but instead extends 'along the multiple pathways of their involvement in the world' (Ingold 2011, 70).

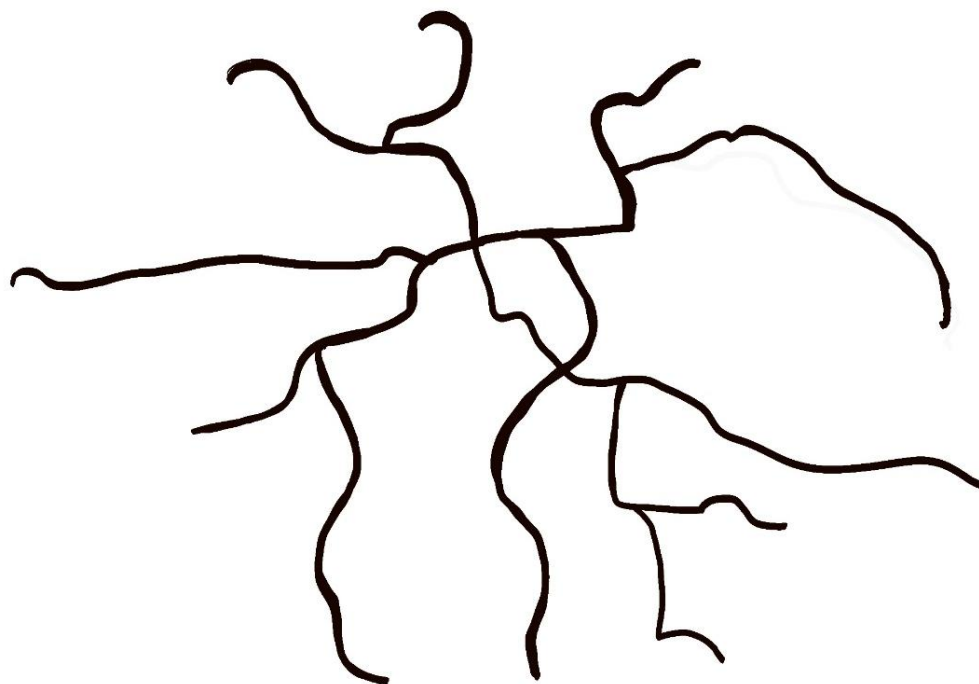


Figure 171 Nicola Moody, copy of drawing by Ingold (Ingold 2011, 70)

The edges or boundaries of *Ever-Evolving* have been created through the coming together of lines that run through the work and out the other side. To follow a line, made easier through the use of different colours, is to visually follow the path it takes. Each path involves

⁹ Ingold draws on the philosophical writing of Gilles Deleuze and Félix Guattari.

interaction with other lines and other paths. Although the lines of *Ever-Evolving* are all composed from the same material, the behaviour of each line still impacts the behaviour of other lines. *Ever-Evolving* exists because of the movement and interaction of different lines of yarn or, at a more granular level different lines of cotton fibres. The lines of *Ever-Evolving* connect and develop in similar ways to the lines of a rhizome or mycelium. Lines of fibre form strand lines, that form lines of yarn, that form lines of weaving, that form another line of weaving, which in turn creates an additional line of weaving.

Ever-Evolving could also be thought of as a 'thread' line. As such it could join with other lines and become a 'trace' line in the creation of another surface. In figure 172 I have taken a photograph of the main section of *Ever-Evolving*. I have copied, pasted and manipulated it several times to suggest how this weaving could become part of another weaving. Figure 173 takes this image further and shows it as a line which in turn could go through the same process. Each iteration creates a larger, more densely packed, weaving together of lines that transform from threads to traces to threads again.

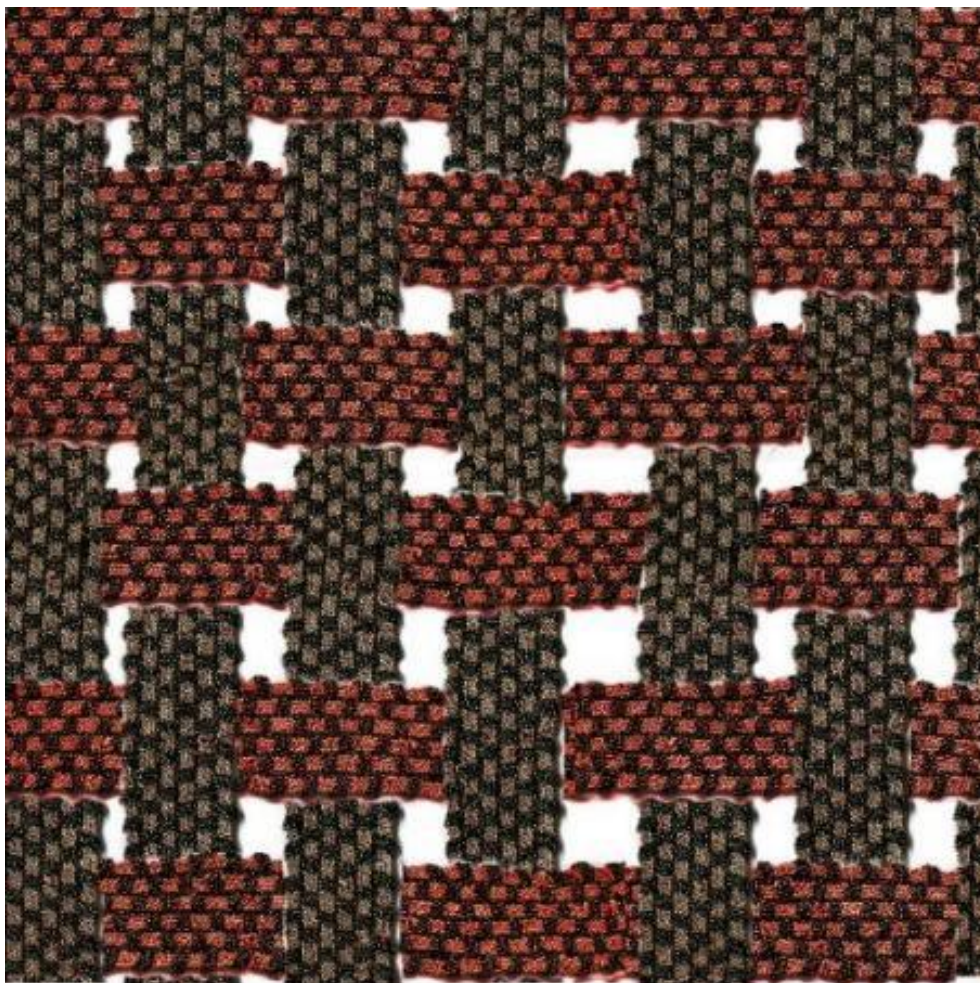


Figure 172 Nicola Moody, digital manipulation of a photo of *Ever-Evolving*, 2024

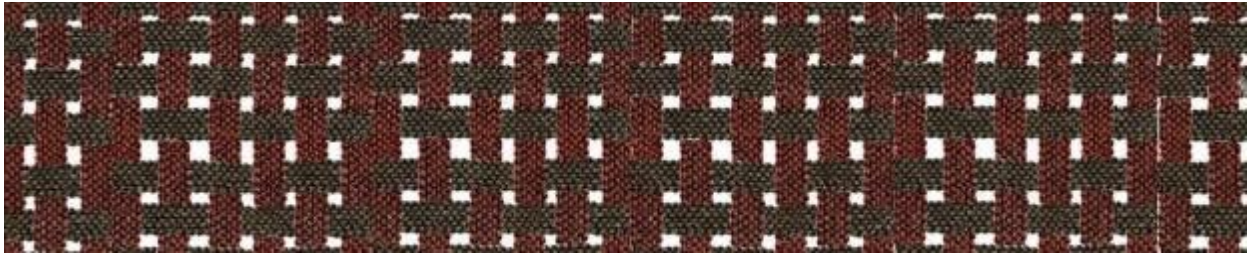


Figure 173 Nicola Moody, digital manipulation of a photo of *Ever-Evolving*, 2024

Movement within the weaving

Using thick lines of yarn to create *Ever-Evolving* makes it easier to observe the movement of lines within the work. Textile researcher Katie Treggiden writes ‘fundamentally, weaving is the formation of a fabric through the interlacing of two sets of threads (the warp and the weft) at right angles to one another’ (Treggiden 2018, 6). This suggests the weft should run perpendicular to the warp. In the first iteration of weaving shown in figures 165 and 174, the weft line of yarn moved up the warp threads at a more acute angle than the usual 90° associated with weaving. As figure 175 shows when the weft was initially used it lay at a right angle to the warp. However, because the weaving was narrow and the warp lines were tightly packed creating an unbalanced EPI, the space between the opening of each shed was greater than the width of the weft. Consequently, the weft had to move up the warp inside the weaving to reach the next shed, thus creating a more acute angle.



Figure 174 Nicola Moody, *Ever-Evolving*, in process, 2024

The movement of lines within the weaving also occurred at other stages of the creation of *Ever-Evolving*. Comparing figure 175 with figure 176 illustrates that the gaps that were present in the second iteration of weaving have been closed through the movement of this line into the weft of the final work. Additional movement occurred when the black, green and white line, used as weft in the final weave (figure 175), bent over and under other thick lines. This caused its constituent parts, namely the previously woven lines and the individual lines of cotton yarn, to expand and contract according to where they were located within the weaving. In the higher sections, the lines were less constrained. The sections nearer the warp lines and, therefore, closer to the actual weave, were more compressed.



Figure 175 Nicola Moody, Ever-Evolving, in process, 2024



Figure 176 Nicola Moody, *Ever-Evolving*, in process, 2024

Ever-Evolving demonstrates how a line's constituent parts remain active. They are impacted by, and impact upon, how the line engages with other lines. Ingold recognises that to depict the complexity of an organism as a single line is too simple. He states 'the lives of organisms generally extend along not one but multiple trails, issuing from a source' (Ingold 2011, 70). The bundle of lines that make up an organism, join with other bundles of lines in the meshwork. Applying observations from *Ever-Evolving* to the behaviour of organisms in the meshwork suggests that lines within each organism impact the encounters they have with other organisms. These encounters also impact the behaviour of the lines from which they are composed.

Fabric can be perceived as a homogenous whole when the lines from which it is composed are not known or acknowledged. In this context the fabric could be viewed as an 'object' using Ingold's understanding of this word; a complete form 'presenting only its congealed, outer surfaces for inspection' (Ingold 2011, 117). *Ever-Evolving* offers a way of understanding weaving as a 'thing,' using Ingold's understanding of this word. He writes 'things' are alive and active not because they are possessed of spirit – whether in or of matter – but because the substances of which they are comprised continue to be swept up in circulations of the surrounding media that alternately portend their dissolution' (Ingold 2011, 29). In this context, a 'thing' is thought of as dynamic. It exists as a response to the interplay

of materials with forces in the world. The movement of materials has, over time, an impact on the 'thing,' causing it to erode, dissolve, or break down.

In *Ever-Evolving* the woven lines and the lines of yarn from which they are composed are visually perceptible. They are part of the fabric, but they are also identifiable as lines. Fabric is susceptible to wear and tear. When the fabric is used, and exposed to elements and forces it is the movement and interplay of the lines within the fabric that cause it to break down. Even when this activity is not visually perceptible it would be wrong to think that the lines are not active in this process. Understanding fabric as the interactive relationship of lines offers a way of understanding how singular interactions can impact the form and creation of a whole.

Depth

All weaving is created through the movement of lines around other lines. In *Ever-Evolving* the build-up of lines leads to an increase in the height and size of the contours that occur as lines interlock. This undulation, and subsequent texture, becomes more exaggerated with every additional weave. Figure 177 shows the second iteration of weaving and figure 178 the final iteration. Regardless of how fine a woven fabric is, the necessary interplay of lines in weaving, means that a texture exists even if it is not perceivable by human sight and touch.



Figure 177 Nicola Moody, *Ever-Evolving*, in process, 2024



Figure 178 Nicola Moody, *Ever-Evolving*, detail, 2024

At each stage of the creation of *Ever-Evolving* the length of the lines was reduced. Conversely, the depth and width of the work increased. Lines of yarn were measured out on a warping frame to a length of 8500 mm; this incorporated excess length to facilitate tying the yarn to the loom. Once woven into strips of weaving (figure 165) the lines reduced to a length of approximately 7800 mm. Once woven into additional woven lines (figure 166) the length of these lines measured approximately 7000 mm. These woven lines were cut in half to form the warp of the final weaving (figure 167). The length of the work at this stage was approximately 2500 mm. The lines of cotton yarn had not shrunk; instead, with every iteration of weaving the lines had to bend and curve to accommodate their movement around the other lines. The thicker the line the bigger the curve. Figure 178 illustrates the significant curve needed for the final iteration of weaving.

The increase in the depth and weight of *Ever-Evolving* is caused by the inclusion and creation of additional lines. If Ingold's meshwork is constructed similarly, it too will grow in depth and weight. The lines could travel not only longitudinally or latitudinally but could also move significant distances down and around other lines. The more lines incorporated into the meshwork the deeper other lines will need to travel. As Willcox suggests weaving is

three-dimensional because lines of yarn are also, three-dimensional (Willcox 1970, 29). Despite this notion, woven fabric is purchased according to length and width. Whilst its weight and thickness may be considered, a conventional understanding of fabric points to the expectation that its length and width will be greater than its depth.

Ingold states that the meshwork is to be understood as a 'texture of interwoven thread' (Ingold 2011, xii). It is, therefore, likely that this meshwork will be understood through metaphorical connections to woven fabric. Understanding the construction of Ingold's meshwork in these terms prioritises the length and width that the lines of thread would travel, over depth. The creation of *Ever-Evolving* has made the three-dimensional qualities of weaving particularly pronounced. The growth of the depth of this woven fabric offers a way of understanding how Ingold's meshwork can expand in every direction.

Chapter 11 Conclusion

This inquiry was prompted by my interest in Ingold's meshwork, which he describes as formed through the interweaving of lines. By examining the behaviour of yarn lines in woven fabrics and analysing why they behave as they do, my research generates insights that inform an understanding of line behaviour within Ingold's concept of the meshwork. I have identified factors relevant to handweaving that are also relevant to how Ingold's woven meshwork is formed and can grow. It builds on Albers' assertion that the problems and decisions involved in weaving, revealed through direct observation of the process, what she describes as 'evident facts,' can provide valuable insights to fields beyond textile practice.

Through this research, I have posed questions not only about what observing lines of yarn in weaving contributes to the concept of meshwork, but also how exploring weaving through the lens of Ingold's meshwork can generate fresh insights for weaving in the field of fine art. In this investigation, I have interrogated Ingold's theoretical ideas through practical experimentation and re-examined what weaving is in light of his theory. The conclusion is divided into three sections. The first two sections answer my research questions, drawing on findings from previous chapters: What additional knowledge can be generated about the meshwork through a practice-based inquiry into the behaviour of lines in handweaving? What new perspectives emerge for weaving as an art form when explored through the lens of Ingold's meshwork? In the third section, I identify possible avenues for future research and potential applications of the approach I have used to conduct this research.

Knowledge generated for the meshwork

In this section, I answer the question, what additional knowledge can be generated about the meshwork through a practice-based inquiry into the behaviour of lines in handweaving? Through the making of samples and artworks, three factors emerged that influence how lines behave in weaving. These factors are:

- Properties of the lines
- Interplay of the lines
- External factors

Any one of these can have an impact on the behaviour of the lines. However, as all the works demonstrate, the three aspects work together. In other words, the same line can behave differently when it engages differently with other lines under different external factors. How the lines behave in these circumstances affects the properties of the ensuing woven structure. Specifically, they impact the texture, density and strength. Ingold states that his meshwork is to be understood as 'interwoven lines' (Ingold 2011,63). How these lines

interweave will, therefore, impact the structure of the meshwork, its texture, density and strength, which in turn will impact how it can develop and grow.

Properties of the lines

We do not know how the lines that Ingold refers to are composed. As a 'student of lines' (Ingold 2015, 53) Ingold identifies lines in a range of settings. He also states that 'every living being is a line or, better, a bundle of lines' (Ingold 2015, 53). It is, therefore, reasonable to suggest that these lines are diverse in their construction and composition. As has been asserted throughout this study and is made clear in the works of Emery (2009) and Seiler-Baldinger (1992), weaving requires some lines to hold their position in such a way that other lines can move around them.¹⁰

Some lines in Ingold's meshwork must be able to maintain their position; these lines will be inherently rigid due to their properties. The rigidity of these lines would mean they are less able to bend around other lines, limiting the number of connections they can make. For lines that do not have properties that enable them to hold their position, external factors will be required for them to become straight and behave as warp. For lines to become interwoven, either lines are dependent on other lines (those that are innately rigid), or external factors are present that enable lines to behave as warp and weft.

Should Ingold's meshwork be dependent on certain lines, these lines are not only crucial for the meshwork's continuation, but their rigidity will also impart a degree of stiffness to the meshwork's structure. Furthermore, their stiffness will limit the types of interactions they can have with other lines. They will remain parallel, behaving like warp threads, and will depend on the ability of the more flexible weft-like lines to bend and connect with them. In short, in Ingold's meshwork, the properties of the lines impact the type and location of interactions that can occur; it is not possible for every line to interact with every other. As a result, relationships within the meshwork are inherently limited.

Interplay of the lines

The interweaving of lines requires an order. The order in which these interactions occur is often referred to as 'the weave.' The alternation of lines that are covered and those that are not will generate a texture. Ingold acknowledges texture exists in his meshwork (Ingold 2011, xii). He writes 'this texture is what I mean when I speak of organisms being constituted within a relational field. It is a field not of interconnected points but of interwoven lines; not a

¹⁰ Anthropologist Irene Emery writes that the warp is 'essentially parallel elements that run longitudinally in a loom or fabric crossed at more or less right angles and interwoven by traverse elements' (Emery 2009, 74). Anthropologist Annemarie Seiler-Baldinger describes the warp lines of most weaving as 'passive' 'in that it is "only" raised and lowered' (Seiler-Baldinger 1992, 76).

network but a meshwork' (Ingold 2011, 70). Given Ingold's emphasis and assertion that it is a 'meshwork of relations' (Ingold 2011, 86) it is likely that this meshwork is composed of different 'weaves'.

Variations in 'weave' will lead to variations in the texture and density of the meshwork. These variations will lead to areas of the meshwork differing in terms of its strength and the ability of the lines to move within the structure. If, as has already been suggested, the lines of the meshwork are composed and constructed differently, the way that they engage with other lines is also likely to vary. Densely packed areas would create a more rigid meshwork. In more open areas, the lines will have greater movement. These areas are likely to be weaker and more susceptible to change. These lines could become more easily separated from the other lines, which would lead to the deconstruction of the meshwork.

Inconsistencies in warp tension are likely when the warp is composed of lines with different properties and different weaves. As *Moving Warp* has demonstrated, these inconsistencies impact the structure of sections that have already been woven. In the meshwork, movements will therefore occur throughout the structure, not simply at the point at which lines of weft are introduced to the warp. Movements throughout the meshwork impact how and when it grows. These discrepancies will have a knock-on effect on the continuation of the weaving and what has already been woven. In short, combining different 'weaves' makes the future growth of the structure unpredictable.

External factors

Unless the construction of the meshwork is reliant on the existence of rigid lines, which, as discussed, would result in a stiff structure, external factors will be required to ensure that some of the lines can hold their position. These external factors could be thought of as forces that enable lines to be pulled and become taut and straight. In Ingold's discussion of the creation of a basket, he considers the involvement of external factors in the shaping of its form. He states, 'one could say that the form unfolds within a kind of force field, in which the weaver is caught up in a reciprocal and quite muscular dialogue with the materials.' He goes on to write that 'this field is neither internal to the material nor external to their practitioner (hence external to the material); rather, it cuts across the emergent interface between them' (Ingold 2000, 342). The point that he is making is that it is not the case that things exist because force has been imposed upon the material; rather, things exist because of the interplay of materials and forces.

The creation of the meshwork should not be understood as the result of forces being imposed on material, but rather as emerging from a dynamic interaction between forces and material. In other words, it is forces internal to the meshwork that cause some lines to

become taut, allowing them to function like warp threads in weaving, and enabling the creation of a woven structure. In short, forces in the meshwork will impact the behaviour of the lines and vice versa, and the meshwork will grow in response to this interplay. The meshwork is not constructed by an external force but grows from interactions within it.

An ever-evolving meshwork

Ingold describes his meshwork as an ever-evolving weave (Ingold 2011, 71). In other words, the over-under interaction of lines is ongoing. This could imply that the meshwork is not expanding in scale but rather evolving through changes that occur within the interplay of its lines. Another interpretation is that the meshwork itself is growing; for this to happen, lines must be endless. This can occur because existing lines grow, additional lines are added, and/ or new lines are created.

In any type of weave, the lines of warp need to be prepared in advance of weaving. It is only after the warp has been set up that the weft can be introduced. Traditional thinking about weaving suggests that the number and length of the warp lines are limited by the capacity of a loom to support them. Ingold states that 'knots, comprise the meshwork' (Ingold 2011, 70). It is, therefore, conceivable that his meshwork continues because knots are added. Whilst knots can occur in weaving, these are usually used to attach weft to weft. Knots in a warp can form an obstruction which, as *Moving Warp* demonstrates, has a significant impact on the ability of the weaving to continue.

It is common practice for new weft lines to be introduced in weaving. In most weaving, the shuttle cannot hold all the weft. The amount of weft that can be pushed or pulled through a shed is also impacted by the size of the shed. Whilst it is possible to pull through one line of yarn in its singular form rather than wrapped around a bobbin, if the weaving is to be ever-evolving without adding additional weft, the process of pulling this line through the shed would be, like the line, endless.

Extending or adding new lines as warp and weft will ensure that the meshwork grows in width and length. However, as the creation of *Ever-Evolving* demonstrated, the meshwork can also be conceived to grow in depth. This draws on Ingold's assertion that lines can transform from 'thread' lines to 'trace' lines and vice versa (Ingold 2010b). The transformation of a line from a 'thread' and back to a 'trace' to a 'thread' in *Ever-Evolving* involves a shift in perspective, in which the woven structure itself is also conceived of as a line. Given the diversity of lines, weaves, and interactions between forces and materials within the meshwork, it is highly likely that its evolution occurs through all these processes, and that their combination further influences its future growth and development.

Summary

In summary, my practice-based inquiry into the behaviour of lines in handweaving has generated additional knowledge about the meshwork, revealing that the construction of Ingold's meshwork is inconsistent in both the properties of its lines and the overall structure formed through their interweaving. These inconsistencies create variations in the texture, density, and strength of the meshwork. This impacts the type and location of interactions between the lines – and, using Ingold's term, their relations (Ingold 2011, 70). My research has demonstrated that within this woven meshwork, some lines can only connect with those in their immediate vicinity, some grow faster than others, and some have distinct roles that enable other lines to grow.

Ingold has indicated that many of these lines can be understood as organisms (Ingold 2011, 70). Applying this idea to his concept of the world as a woven meshwork means that some life forms can only connect with those in their immediate vicinity, some grow faster than others, and some have distinct roles that enable other life to grow. However, because the meshwork is shaped by interactions between lines, and these interactions are also influenced by others throughout the meshwork, life, like a line of yarn in weaving, may not directly contact another. Yet, the behaviour of one life or line can, over time, have significant implications for other lines. Therefore, how the woven meshwork develops, in terms of its texture, density and strength, will affect how life can interact and ultimately continue.

As discussed in the introduction, Ingold states 'information in the book is not, in itself, knowledge. Rather, it opens up a path to knowledge, thanks to its location within a field of practices that is already partially familiar by virtue of previous experience' (Ingold 2013b, 305). Ingold has presented information in several books and articles about the behaviour of lines in the meshwork. The necessity of words in writing means that Ingold's notion of lines, meshwork and the flow of forces are presented as distinct things. While he can describe their connections, he must do so using separate terms. In contrast, the process of weaving inherently embodies these connections; it is the interplay of lines in a flow of forces.

By exploring through a weaving practice, as has been done in this study, how lines interact and which interactions best support the continuation of weaving and the conditions that influence them, we gain insights into factors that can be applied to the meshwork. As discussed, the meshwork, like handweaving, will develop and grow in numerous ways. There are not several meshworks, but rather a single one that encompasses immense variation. Comprehending the entirety of the meshwork is perhaps an impossible task. However, my research has generated an understanding of how sections of the meshwork behave and how these localised behaviours have implications for other parts. In short, by

understanding the weaving process, we can better understand how life in the world, understood as a woven meshwork, can grow, what may hinder its growth, or cause it to develop in different ways.

New perspectives for weaving

Through this research, I have also sought to answer the question: what new perspectives emerge for weaving as an art form when it is explored through the lens of Ingold's meshwork? My investigation has interrogated what Ingold considers significant in weaving for his understanding of the 'meshwork.' Investigating his theory on how lines form a meshwork and applying this to the behaviour of lines in handweaving leads to weaving being understood as the interplay of lines and their materiality in a flow of forces – a cyclical relationship between the lines and the forces. These interactions impact the woven form when it is both on and off the loom. Lines of yarn do not exhibit a fixed behaviour, but like the lines in the meshwork and lines made by wayfaring, they respond to what they encounter. Weaving in this context is seen as a responsive process, and what is created is thought of as the collective behaviour of lines and forces interacting.

Using Ingold's presentation of weaving means understanding it as an ongoing process. To view a woven artwork as a finished product, complete, is to overlook the ongoing interaction of distinct lines that must be maintained for the weaving to exist. In this sense, the artwork remains in a state of weaving, as the lines of yarn continue to engage with one another. A more accurate understanding sees the work not as a static outcome, but as the ongoing interplay of distinct lines in space. While the weaving process is most visibly active on the loom, it does not end once the yarn is removed; the lines still pass over and under one another, and in this way, the weaving process continues. In short, weaving should be thought of as a verb at all stages.

Ingold's meshwork, composed of interwoven lines, is created through the interplay of materials and forces. He writes, 'to understand materials is to be able to tell their histories—of what they do and what happens to them' (Ingold 2012, 434). Applying Ingold's assertions to a woven piece is to view it as a collection of histories. Each line brings to the weaving its own history, shaped by the events that led to its formation as a line, such as how the fibres are formed and spun. The use of the word 'events' here aligns with Albers' understanding presented in chapter 2: what occurs is part of a continuum, building upon what has gone before. A weaving, then, can be understood as a site of interactions between distinct histories. Each weaving is then understood to have a unique history, made up of many others, and something that continues to evolve. As such, it can be thought of as dynamic.

I discuss Ingold's understanding of space in chapter 9. For him, the idea of space as an empty void does not fit within his meshwork, which consists of lines that are constantly moving and growing. Instead, he proposes the term 'fluid space' (Ingold 2011, 86). While I continue to use the term 'space', my understanding aligns with Ingold's rejection of it as a void. I view space as essential to weaving. It not only provides room into which the lines can move, but it also enables a distinction to be made between lines. Forces present in the space impact the lines. Although these interactions may not be visible, recognising space as a site of active and integral to weaving supports the idea that weaving is always evolving. This again reinforces the argument that the term 'weaving' should always be used as a verb to describe the ongoing interplay of lines, even when the lines are no longer attached to the loom.

In summary, exploring weaving through the lens of Ingold's meshwork suggests that weaving can be perceived as the interplay of lines in a flow of forces. The lines remain paramount; they have not become something else; they are still active. Weaving is then the ongoing interaction and evolution of lines and their histories, and the movement of lines within space. The artworks created for this study have been used to draw out these findings. They are displayed in an exhibition and are considered research outputs. The works in this study are informed by Ingold's understanding of weaving. Applying Ingold's perspective to the weavings in my accompanying exhibition means that these works can also be seen as dynamic and processional, even though they have been removed from the loom, the lines within these artworks are still considered active, although their movement is not readily apparent.

Future explorations

I have concluded this study by explaining how understanding Ingold's meshwork is enhanced by examining the behaviour of yarn lines in weaving. Additionally, I have shown how weaving can be perceived through the lens of Ingold's meshwork. Using Nelson's multi-modal model, this knowledge was generated by combining the 'know-that' from Ingold, other practitioners, and the theories of Albers with the 'know-how' derived from my art practice. Through analysing the artworks created for this research, I have identified what can be known – the 'know-what'. Following this cyclical model for research, the conclusions reached in this chapter can now be used as a form of 'know-that' for further exploration in subsequent research. I have identified three possible areas for further exploration.

First, the understanding of materiality and physicality presented here could be used to provide additional insights where Ingold's meshwork is used in other fields to generate new understandings. For example, researchers Narelle Lemon, Anat Wilson, Catherine Oxworth,

and Agli Zavros-Orr use Ingold's meshwork to explore partnerships between schools and universities in Australia. They state that, 'by using Ingold's framework, this paper reveals the entanglement of lines and intersections that are present in the realisation of what a partnership can look like' (Lemon et al. 2018). The researchers draw heavily on Ingold's presentation of lines and the meshwork to frame and understand their subject matter.

My research presented in this dissertation supplements other types of research that rest on Ingold's meshwork by offering a more detailed understanding of the meshwork itself. My research proposes factors that impact and influence the lines' behaviour and, therefore, what is constructed. Viewing Ingold's meshwork through the lens of my research may raise additional questions: Which lines are most important? Which has the greatest potential to move, connect, or grow? Answers to these questions can generate an understanding of the density of what is created, which in turn has implications for its flexibility and strength. Asking such questions may reveal deeper insights into the systems and institutions to which Ingold's meshwork is applied.

Secondly, the ways of viewing weaving in light of Ingold's meshwork, presented in this research, can also be thought of as a form of 'know-that', which can now be explored further through practice. My research has presented concepts that could be taken further in additional work beyond the scope of my study. Just as Wilson employed a large warping frame and numerous dancers to highlight the intense and extensive labour involved in textile production, Tanaka used her grinding technique to advance erosion, Hillard incorporated sound to deepen the notion of fading memories, and Hamilton combined sounds, birds, and swings to explore connectivity; similarly, new works could be created to draw greater attention to the dynamic nature of weaving as presented in this study. This could be achieved, for example, by filming the weaving process to enhance the perception of movement; using machines to pull yarn lines in various directions through a woven artwork or to unravel a woven piece; or by expanding the scale and depth of *Ever-Evolving* to suggest continuous transformation. Each of these approaches could further accentuate and investigate how weaving can be perceived as a verb at all stages.

In addition, drawing from Ingold's concept of lines as 'paths,' and the notion that a place is formed because of interactions that occur through different lines or paths (discussed in detail in chapter 7) corresponding, woven artwork that enables lines to move and shape a form through their interactions can be seen as forming a 'place.' By focusing on the materiality of lines interacting with each other and forces in space, new woven artworks could be created that further explore how weaving can be understood as a form of 'place-making'. Using Albers' understanding of an 'event,' these places can be seen as events emerging from prior

events. To fully appreciate how these lines, which could also be thought of as events, paths or histories, behave, there is merit in enabling all parts of the lines to be visible, not concealing the behaviour of the lines against walls.

Thirdly, beyond the specific findings of this study, my research has also opened up broader methodological potential. Exploring how 'weaving' is understood in other fields could generate new insights and questions for its application within fine art. Using Nelson's multi-modal model and Cazeaux's concept of the 'metaphoricity of materials' as a framework, a comparative investigation could be undertaken. One potential direction for future research is to apply the approach of observing 'evident facts' (Albers et al., 2017, ix) in a weaving practice to explore how weaving can inform storytelling, and vice versa.¹¹ This could potentially generate new insights into both practices.

¹¹ As discussed in Chapter 2, Albers sees working with materials as a form of communication and describes learning to 'speak' the language of her material –threads. This connection between language and textiles is also evident in everyday expressions. Curator Lynne Cooke notes that phrases like 'spinning a yarn,' 'a stitch in time,' 'the fabric of life,' and 'the hand of the cloth' are so common that we rarely notice them, yet they shape how we communicate (Cooke, 2023, 2). In storytelling, we also talk about 'weaving a plot,' 'following a thread,' or likening a story to a tapestry.

Appendix

Material choice

In this appendix section, I outline the framework used to select mercerised cotton in three different weights as the primary material for this research. This approach engages with what Albers, in 'Tactile Sensibility', a chapter in *On Weaving* (Albers et al., 2017), refers to as the 'concerns of the weaver.' Through systematic observation of various yarn types and attention to what Albers terms 'evident facts' (Albers et al., 2017, ix), I identified the most appropriate material for my investigation. To maintain focus on the behaviour of lines rather than the intrinsic properties of materials, all samples were produced using the same type of yarn. Although alternative materials are employed in one of the eight artworks, the rationale for this variation is discussed in the relevant chapter.

The materiality of a line of yarn impacts the properties that it displays during the weaving process. In the course of my research, I have conducted experiments with raffia, wool, cotton, silk, wire, acrylic wool, and monofilament. Cotton, raffia, and linen are plant-based natural fibres, wool and silk are animal-based natural fibres. Wire, monofilament, and acrylic wool are man-made. Monofilament and acrylic stem from oil. Steel wire is created from carbon and iron. Their properties derive from the conditions in which the raw material is produced and the processes the materials have been through. The combination of these two factors impacts their behaviour.

I had the following requirements for the yarn that I chose: it needed to be strong enough to be used as both warp and weft. The edge of the line needed to be clearly defined so that its movements could be observed within both the weaving process and the final product. It needed to be available in different weights. This would enable comparisons regarding how weight impacted behaviour and how combining the different yarn weights impacted what was created. The yarn also needed to be available in different colours so that attention could be drawn to specific lines in the weaving. In addition, the yarn had to be pliable by hand. This would enable observations of how its pre-weaving treatment impacted its behaviour and the behaviour of the subsequent fabric.

Selecting yarn

In the early stages of my research, I worked with eight different yarns. In this appendix, I explore each of these different yarns in relation to the following criteria.

1. ability to be dyed
2. ability to be plied

3. tensile strength
4. stiffness
5. toughness

Many of the findings used in this section come from *Different threads 1* shown in figure 179 and *Different threads 2* shown in figure 180. Both works use the same warp which was a mixture of the 8 different yarns. In *Different threads 1* every 100 mm a new weft was used. This enabled observations to be made of how each material responded to this particular weft and comparisons to be made across the materials. In *Different threads 2* warp threads were combined, and different patterns were used to explore if combining materials as weft mitigated the changes in behaviour noticed in *Different threads 1* and if the materials behaved differently when different weave structures were used.



Figure 179 Nicola Moody, *Different thread 1*, 2022



Figure 180 Nicola Moody, *Different threads 2*, 2022

In addition to these examples, I also created 5 sets of experiments that combined different materials. These experiments were set up to explore differences in the behaviour of warp yarns when a reed was used and when it was not. Unlike *Different threads 1* and *Different threads 2* the same material was used as warp in each, but different weft threads were introduced. Photographs of details of these works are used in the following section to illustrate specific points about the behaviour of different yarns.

A yarn, available in a variety of colours due to its dyeing capability, is useful for making visual comparisons of line behaviour. In addition, a yarn's pliability is pertinent to my research.

Tensile strength refers to the amount that a material can hold before snapping. A high tensile strength is desirable for a reliable warp. It will withstand tension and enable the interweaving of weft threads without disruptions caused by thread snapping. Stiffness refers to the ability of the material to move. Stiff materials generate stiff fabric. The opposite of a stiff yarn would be a flexible yarn one that easily bends and moves. Toughness refers to a yarn's ability to withstand abrasion. Abrasion occurs in the weaving process, particularly when warp threads are repeatedly raised and lowered.

I also consider the sustainability of a yarn. Whilst this is not a primary concern in selecting a yarn for this inquiry, it is a factor that impacts my choice when presented with materials that have similar properties. As all yarns have been gathered and processed, they all have an environmental impact. It could be argued that wool is the most sustainable of the materials I have used. Unlike silk, the animals are not killed to get the fibres that will make the yarn.¹² Plant-based yarns such as linen and raffia are also thought to be more sustainable than cotton because fewer chemicals and less water is used in their production (Muthu 2014; Richards 2021). I will explain why I did not select raffia, linen or wool as my primary material for reasons pertinent to answering my research questions. Man-made materials such as wire, monofilament and acrylic take longer to decompose. The synthetic fibres used for acrylic wool and monofilament also release microplastics into the environment making them a less desirable choice in terms of pollution (Sandin, Roos, Johansson 2019).

Monofilament/ fishing line

When using monofilament for weaving, the lack of fibre and slippery surface of the yarn resulted in significant movement within the weave structure, as shown in figure 181. Despite the yarn having been beaten into place it did not lie still, some lines touched, others looped. The moving of the warp threads caused the movement of the weft to be restricted. Other yarns that interacted with the monofilament also moved. Figure 182 shows cotton with slub and silk yarn both used as weft. Although pushed into place by the beater, the lines moved apart sliding over the monofilament.

¹² Silkworms create cocoons from silk fibres. To access the silk the worm and the cocoon are exposed to heat, thus killing the worm and enabling the long continuous fibre to be accessed. It is possible to use silk from cocoons where the moth has hatched but these cocoons have shorter fibres due to the breaking of the cocoon when the moth escapes. These fibres can be spun to make longer strands of silk.

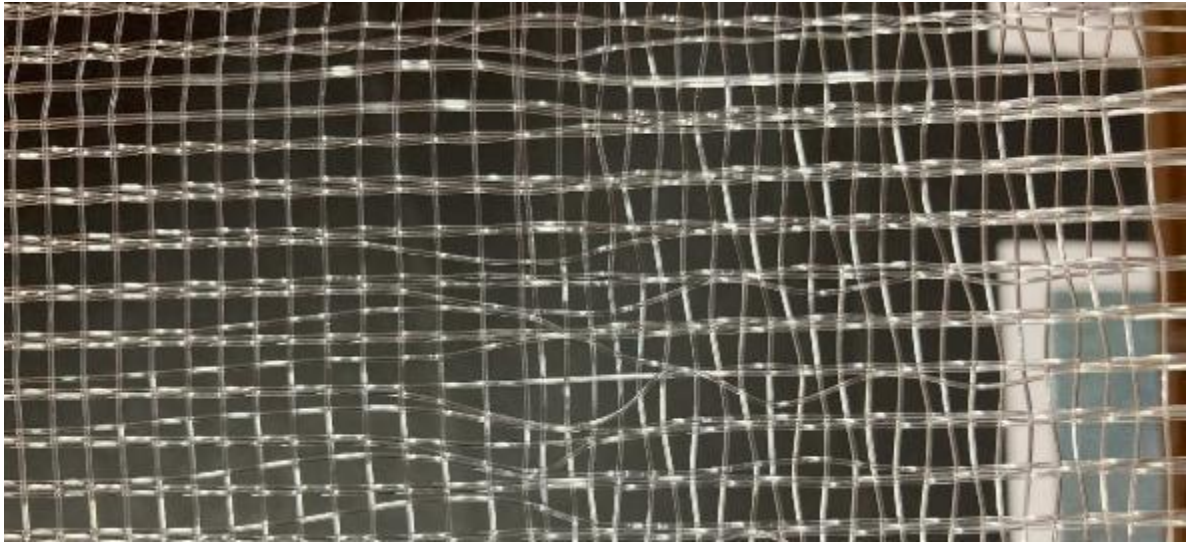


Figure 181 Nicola Moody, *With reed monofilament*, detail, 2022



Figure 182 Nicola Moody, *Different threads 1*, detail, 2022

The lack of grip and subsequent movement is made even more apparent in *No reed monofilament* shown in figure 183.¹³ The warp threads move together in sections.

¹³ A work created to explore how lines behave in the creation of a woven meshwork when a reed or beater is not used. In this experiment and others, the lack of a reed and beater caused the warp threads to move together, creating a densely packed warp-facing structure.

Sometimes the weave is open. At other times it is densely packed and warp-facing. Once off the loom, the lines create a wavy structure. The yarn's propensity to slip and thus generate movement is further demonstrated in the setting up of the monofilament warp. Although it is possible to knot monofilament the lack of grip meant that the yarn sought to push back through the knot, tape had to be used to secure it to the loom as shown in figure 184.

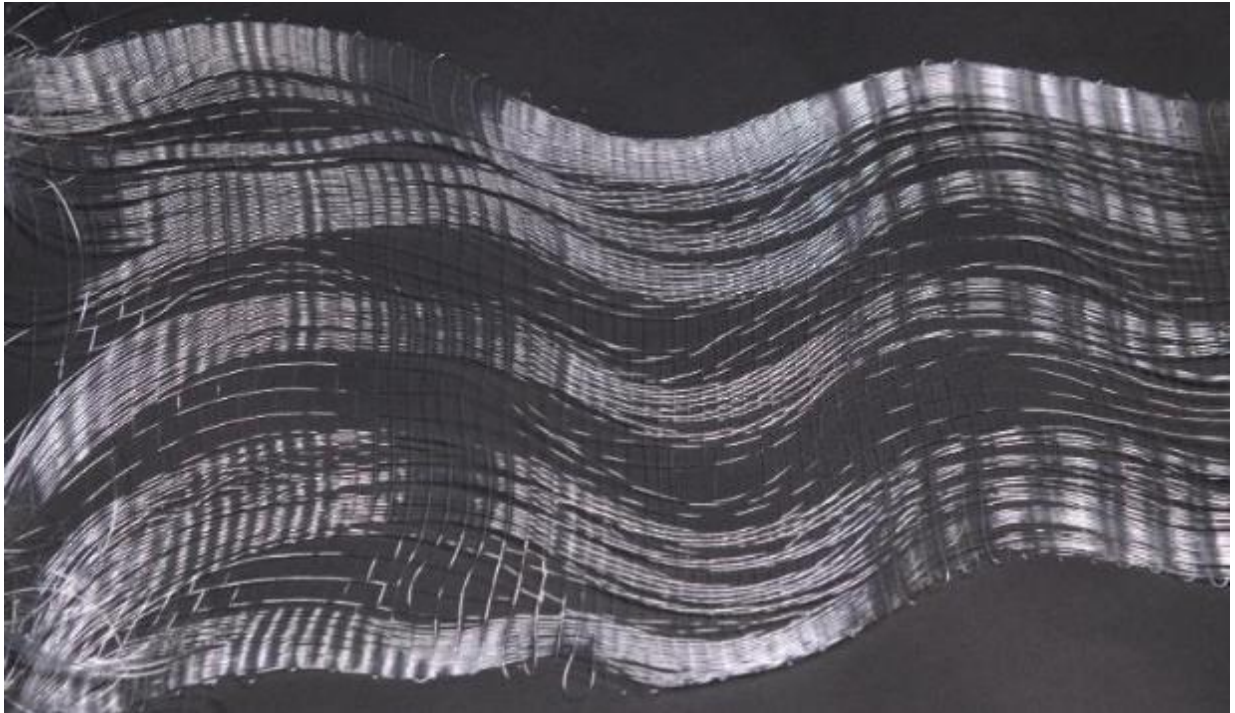


Figure 183 Nicola Moody, No reed monofilament, detail, 2022



Figure 184 Nicola Moody, With reed monofilament, in process, 2022

This monofilament made from nylon has a high tensile strength. Material scientist J.E. Gordon states that nylon thread can support 150,000 pounds per square inch (Gordon 2009). In other words, its PSI (pounds per square inch) is 150,000. However, the PSI is likely to vary depending on the number of strands used to create a nylon thread. What is significant is that it has a higher PSI compared to other yarns I have used. This increased

strength likely explains why it did not snap, unlike the other yarn. The warping-up process was however challenging because these threads slipped out of the knot.

Whilst it is conceivable that strands can be twisted together in the creation of a plied yarn, again due to its lack of fibres and slippery surface it is likely that, as with a knot, it will unravel. Evidence of this unravelling can also be seen in figure 185 which shows a monofilament bobbin and a cotton bobbin. The monofilament had to be pulled taut for it not to unravel and create additional and in this case obstructive loops.



Figure 185 Nicola Moody, monofilament and cotton bobbins, 2022

The stiffness of the monofilament meant that when used as a returning weft it created a loop at the selvedge. It needed space, it could not be compressed. Even when beaten down it resisted staying in this position. The size of this loop impacted the spacing of subsequent weft as shown in figure 186. The stiffness of this yarn is further evidenced in figure 187 which shows a section of weaving that combines six different yarns. The loops of the monofilament and the wire stand out unlike those created by the fibrous yarns. Monofilament can be purchased in different thicknesses and colours. Monofilament also offers opportunities to observe the movement of lines in a meshwork, it would, however, require very specific handling and the use of techniques not commonly associated with handweaving.

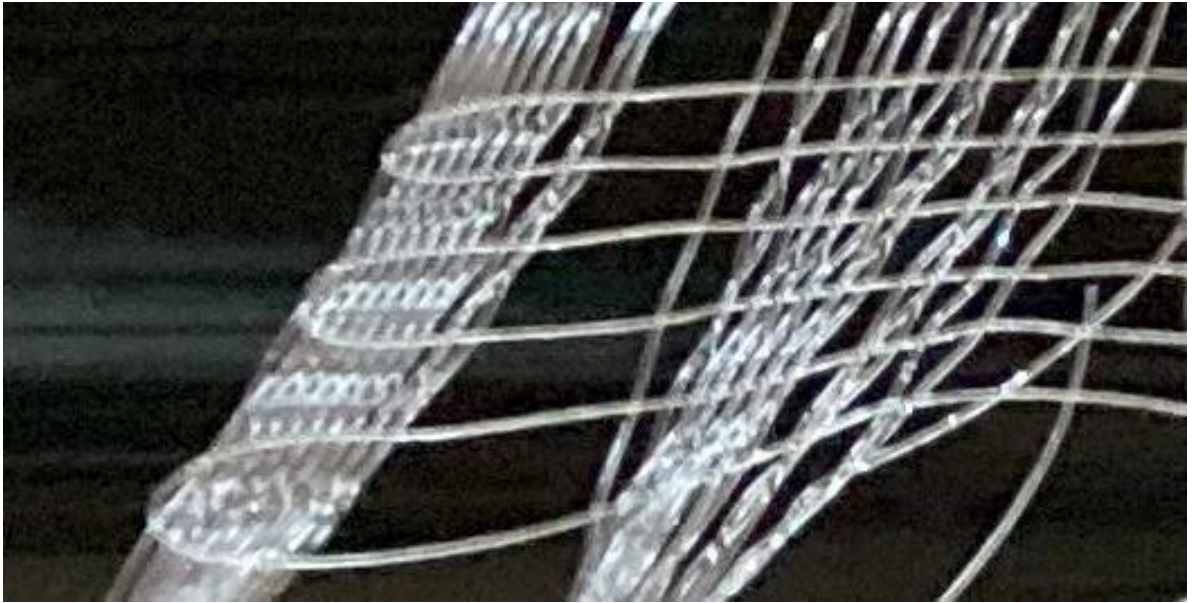


Figure 186 Nicola Moody, No reed monofilament, detail, 2022



Figure 187 Nicola Moody, Different thread 2, detail, 2022

Steel Wire

Steel wire is available in different thicknesses. It can be twisted to generate a yarn that resembles a ply, but it is held together not by fibre but by bends that lock the strands together. I had to use a similar twisting technique when the wire snapped, and a knot was created as shown in figure 188. Looping the wire in the creation of a knot led to the compressing of the wire and the forming of an angle. This generated an area of additional weakness noticeable by the subsequent snapping of the wire at the point where it had bent to form the knot. I therefore had to twist the wire together to increase its strength and allow it to loop around a secured pin to try and ensure it remained in place as shown in figure 189.

As has already been shown in figure 187, with monofilament, when the wire was used as weft it created loops. However, unlike the movement of the monofilament, the beating and subsequent compressing of the loop created an angle in the wire and a potential area of weakness as shown in figure 190.



Figure 188 Nicola Moody, wire knot, 2022



Figure 189 Nicola Moody, Different threads 2, in process, 2022

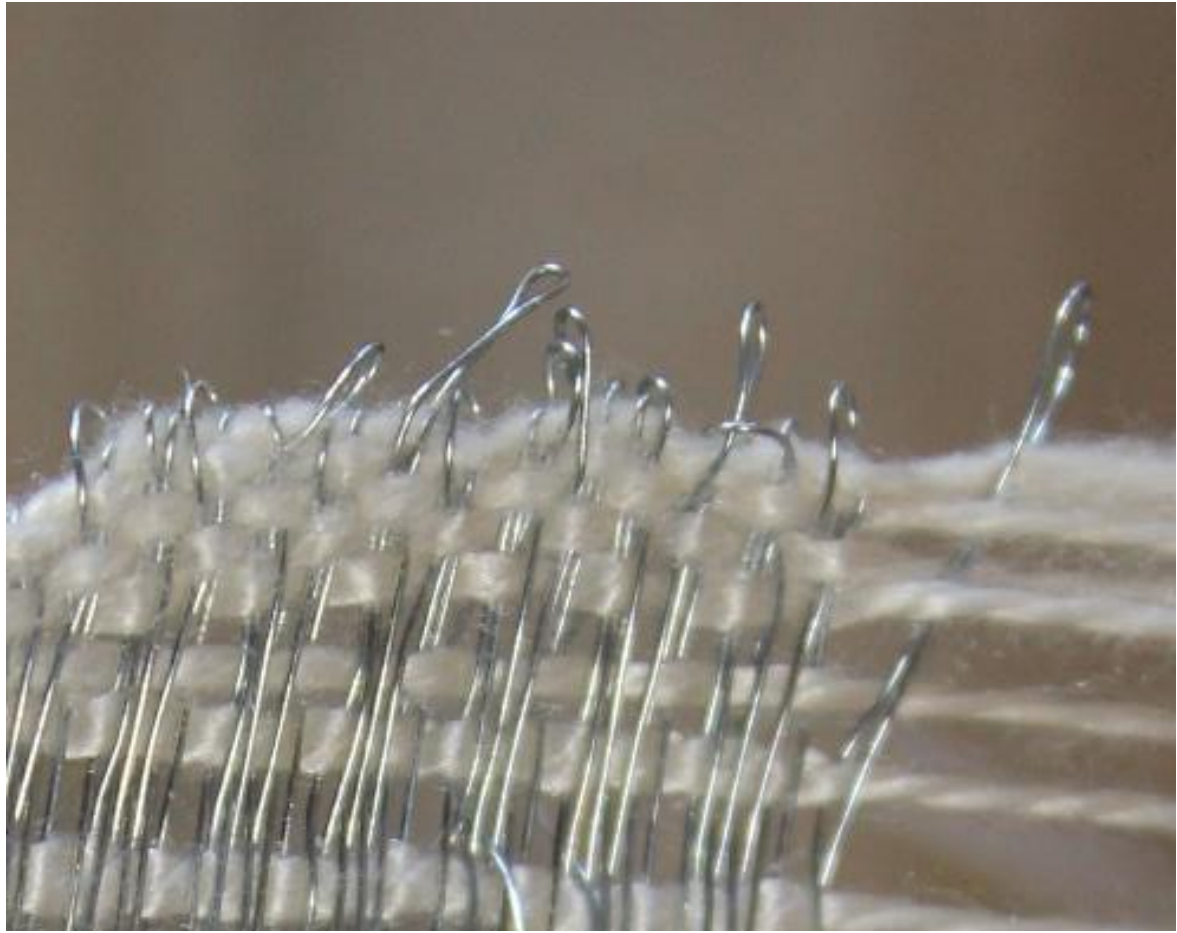


Figure 190 Nicola Moody, Different threads 2, in process, 2022

According to Gordon, commercial mild steel has a PSI of 60,000 (Gordon 2009). This wire is therefore likely to have a high tensile strength. It can hold more weight than several of the other yarns I used. It snapped not because it lacked strength but because it was not ‘tough’ enough. Richards describes toughness in the context of weaving as ‘the ability of a material to absorb energy without breaking’ (Richards 2012, 12). When the wire warp was used alongside a silk weft the selvedge was pulled in. The wire simply complied and moved inwards as shown in figure 191. It did not withstand or absorb the energy created by the movement of the silk thread. When the wire selvedge was repeatedly touched by the movement of a fibrous weft it snapped as shown in figure 192. The shape of the weaving changed through the reduction of warp threads.



Figure 191 Nicola Moody, Different threads 1, in process, 2022



Figure 192 Nicola Moody, Different threads 2, in process, 2022

In addition, wire cannot be dyed although it can be coated or painted. Colour is added to the surface and not absorbed into the material. In this sense, it is independent of the material and could be impacted by an increase in friction during the weaving process. While it is possible to select a tougher wire, its stiffness, and inability to be dyed or plied limit the opportunities that it would offer to observe the behaviour of lines.

Acrylic wool

The experience of weaving with acrylic wool is similar to weaving with natural wool. It has been designed as a cheaper alternative. Many 'wools' are a combination of natural and man-made fibres. Many of the properties of wool, such as its lack of strength, are alleviated by mixing it with acrylic wool (Miller 1995; Richards 2021). They behave in similar ways as shown in figure 193. The cream yarn is natural wool the white yarn is acrylic. In this image, these yarns are used as weft and interact with 7 different types of warps indicated by the creation of stripes. Differences in weave structure are the result of different interactions between warp and weft. The behaviour of the natural wool is closely mimicked by the behaviour of the acrylic wool. As weft, they respond in a similar way when they meet different warps. These yarns can be dyed, purchased in different weights, and are strong enough to be used as a warp. This yarn seems like a good option to explore the behaviour of lines in a meshwork. However, its synthetic fibres result in a slower biodegradation process and have a higher environmental impact due to its method of manufacture.



Figure 193 Nicola Moody, *Different threads 1, detail*, 2022

Natural wool

The plying of wool can impact its strength, the wool I used was 4-ply, strong enough to be used as warp. However, when used as a warp it was not resistant enough to withstand the more intense movement that occurs at the selvedge. The fraying of the yarn shown in figure 194 caused it to stretch and move. The pulling of the fibres within the yarn led to an increase in its length and a reduction in thickness, in other words, it was not tough enough. Figure 195 shows the woollen warp not holding its position. Figure 196 shows the impact of this stretching on the fabric. The excess length is woven in, and a rippled edge is created. By increasing the angle of twist in the yarn the fibres would become more tightly packed and less susceptible to abrasion and subsequent stretching. This yarn would however be stiffer, less flexible and potentially offer less opportunity to observe movement.



Figure 194 Nicola Moody, With reed Wool, in process, 2022



Figure 195 Nicola Moody, With reed wool, in process, 2022



Figure 196 Nicola Moody, With reed wool, in process, 2022

Wool is highly fibrous, when it interacts with other yarns it holds its position more readily. This can be seen when figure 197 is compared to figure 198. Figure 197 shows differences in behaviour that occurred when a silk weft interacted with different warp yarns. The growth of the weaving up the warp was impacted by the different combinations of yarn. Differences in behaviour were much less noticeable when wool was used. Figure 198 shows that as more wool was woven in as weft the inconsistencies in behaviour of the silk yarn gradually levelled out. Regardless of the materiality of the different lines of warp, the fibres within the wool caused it to grip.



Figure 197 Nicola Moody, Different thread 1, detail, 2022



Figure 198 Nicola Moody, Different thread 1, detail. 2022

For many reasons, wool is deemed to be an excellent material for exploring the behaviour of lines within a woven meshwork. It is easily dyed, plied and available in different weights. However, because of the multiple fibres used in its creation, it can easily grip leading to a reduction in movement. The amount of fibres present in a fabric created from a woollen warp and weft leads to a more uniform appearance. This makes the behaviour of individual lines

harder to discern as shown in figure 199. Both the wool and cotton fabrics have a sett appropriate for a balanced plain weave. However, the less fibrous, smoother lines of the cotton enable the structure and individual lines that compose this weaving to be more visible.



Figure 199 Nicola Moody, With reed cotton and With reed wool, detail 2022

Linen

Linen could also be seen to be a good choice for exploring the behaviour of line in handweaving. It is strong and sustainable. It is made from flax, which is easily grown and harvested. It is available in different weights and can be spun. It can also be easily dyed. However, it lacks flexibility when compared to other yarns. Figure 200 shows the rigidity of this yarn. Despite being beaten the weft threads rarely touch. It could be argued that this behaviour is in part due to the sett of a balanced weave. Figure 201 shows a warp-facing pattern on the left and a balanced plain weave on the right. With an increase in weft, the linen yarn is compressed further and touches. However, loops are noticeable at the selvedge. The stiffness of the yarn prevents it from being tightly compressed.



Figure 200 Nicola Moody, With reed linen, detail. 2022



Figure 201 Nicola Moody, With reed linen, detail, 2022

Linen according to Gordon has a PSI of 100,000 (Gordon 2009), a higher tensile strength than most of the other yarns I have worked with, however, it is not tough. In a similar way to the wool yarn at the selvedge shown in figures 202 and 203. The movement of the beater and the raising of the shafts (the part of the loom that holds the heddles) led to a loosening of fibres. This caused the yarn to stretch as shown in figure 202. The continuation of this process led to yarns snapping. I resecured them with a knot, but this caused obstruction in the weaving as shown in figure 203. These images also show the fibrous quality of this yarn. As with wool, the fibres help it to grip. Although as a warp yarn, it may snap, as weft its behaviour is predictable and consistent. Figure 204 shows a rhythmic consistent pattern created with a linen weft passing over a range of different warps. The linen weft does not behave differently when it encounters different warp threads. This suggests that when compared to other yarn options, this yarn is more stable and less prone to movement.



Figure 202 Nicola Moody, Different threads 1, in process, 2022



Figure 203 Nicola Moody, Different threads 1, in process, 2022



Figure 204 Nicola Moody, Different threads 2, detail, 2022

Raffia

Raffia has undergone minimal processing contributing to its sustainability, but it is not a suitable product for my investigation. It is only available in short lengths since it is made from palm leaves. It can twist and potentially be plied. However, as it is composed of long fibres compressed and running in the same direction. Twisting the yarn can make it stiffer, but the fibres will not grip like wool, silk and cotton. Although strands can be tied to others to increase its length the knots can interrupt the weaving process as shown in figure 205 and 206.



Figure 205 Nicola Moody, No reed Raffia, in process, 2022



Figure 206 Nicola Moody, No reed Raffia, in process, 2022

Raffia is also not tough. The weaving process was abrasive and caused the raffia to split. This can be seen in figure 207. The split warp moved freely within the shed and became tangled to other lines of warp as shown in figure 208, creating further disruption to weaving. The strength of the raffia comes from the fact that it is composed of long staple lengths. Combined with its stiffness it is often used as a suitable material for basket and rug weaving (Buchanan 1999). If a loom is required, it will be of a basic construction thus limiting the movement of the warp and its ability to interact with other lines.



Figure 207 Nicola Moody, No reed Raffia, in process, 2022



Figure 208 Nicola Moody, No reed Raffia, in process, 2022

Silk

Silk, like wool, can be easily spun, available in different plies and weights. It is particularly well known for its ability to be dyed. It is strong, tough and flexible. Unlike wool and linen, it did not stretch when used as a warp. It did not move inwards on the selvedge as had been the case with wire. When used as weft it smoothly looped around the warp threads on its return journey. These points are illustrated in figure 209. In short, it is a very desirable yarn and would serve my purposes for exploring the behaviour of lines within a weaving.

However, silk is an animal product that requires the death of silkworms and is expensive. Therefore, despite its useful qualities, I was open to alternatives if they were sufficiently comparable and useful for my research.



Figure 209 Nicola Moody, Different thread 2, detail, 2022

Mercerised cotton

Mercerisation refers to a process in which cotton fibres are enlarged, and the yarn is stretched. Mercerisation increases the strength of the yarn. This makes it a more resilient yarn than un-mercerised cotton, particularly beneficial for lines of warp. Mercerisation also causes the yarn to have a greater affinity to dye. Additionally, mercerisation gives the cotton a lustre like that of silk. The strands become more cylindrical in this process. The fibres lie in the same direction which results in a lack of friction and subsequent grip, there is a greater propensity for movement (Cook 1968; Miller 1995).

Investigating the behaviour of lines of yarn by using yarn with a greater propensity to move offers opportunities to observe differences in behaviour. In an experiment with a silk weft and a monofilament warp, the lustre of the silk and the lack of grip of the monofilament meant that the silk moved within the weaving as shown in figure 210. Figure 211 shows a section of weaving with silk followed by a section of weaving with wool. In both sections the yarn moves more freely when woven with monofilament and wire as shown in the section second from the left (monofilament warp) and on the right (wire). However, the movement of the silk is more pronounced. As weaving with wool continues the impact of the different warp threads

is less evident. The fibrous qualities of the wool enable a greater amount of grip and the lines of weft become more consistently straight, at right angles to the warp.



Figure 210 Nicola Moody, Different threads 2, in process, 2022



Figure 211 Nicola Moody, Different threads 1, in process, 2022

Mercerised cotton and silk have similar properties. According to Gordon, silk and cotton both have a PSI of 50,000 (Gordon 2009). Neither silk nor cotton presented problems with stretching, stiffness or fraying. Both are reliable as warp and weft. Silk is, however, thought

to be a better receiver of dye than cotton and its lustre allows for it to move within the weave as shown in figure 211. However, the mercerisation process means that mercerised cotton yarn has a similar lustre and ability to hold dye as silk (Cook 1968).

I have created a table shown below to summarise my findings utilising the previously identified categories. I have made statements about the yarns that I have engaged with based on my experiments. I have given them a rudimentary score of low, medium or high as a means of differentiating between these materials and drawing conclusions.

Yarn	Ability to be dyed	Ability to be plied	Strength	Flexibility	Toughness	Environmental impact
Monofilament	Medium	Low	High	Low	High	High
Wire	Low	Low	High	Low	Low	High
Acrylic wool	High	High	Medium	High	Medium	High
Natural wool	High	High	Low	High	Medium	Low
Linen	High	High	High	Low	Low	Low
Raffia	Medium	Low	Medium	Low	Low	Low
Silk	High	High	High	High	High	Medium
Mercerised cotton.	High	High	High	High	Medium	Medium

Although linen, raffia, and wool offer the lowest impact on the environment they lack the strength or flexibility present in silk and mercerised cotton. For my research, there is little to distinguish between silk and mercerised cotton. It is only when toughness is considered that there is a significant difference. Silk is tougher it can withstand more abrasion it is more reliable and predictable. Cotton has the possibility of offering a greater amount of change and movement within the weaving. Offering greater opportunity to explore behaviour. In addition, the 30/2 ne and the 8/2 ne cotton yarns I have selected are organic which reduces the environmental impact of these yarns. Based on this and the aforementioned observations about the other yarns from my experiments, I have selected to work with mercerised, cotton yarn in two weights.

Yarn weight

The mercerised cotton yarn I have chosen is 2-ply, in other words, two strands of yarn have been twisted together this process adds strength to the yarn. However, yarn with a greater amount of twist can be stiffer (Richards 2012). I have selected yarn with less twist which makes it more flexible and offers more potential for movement. I have used mercerised cotton yarn in two weights 30/2 ne and 8/2 ne. The first number refers to the number of 840 yards that have been spun from a pound. The 2 in this instance refers to the 2 plies. These two yarns will behave in similar ways because they have been composed of the same material grown in comparable conditions and have undergone parallel processes of

production. They differ in the number of fibres collectively lined up in the creation of each strand, thicker strands will contain more fibres within a given length.

Finer yarn creates a finer surface which impacts how the fabric drapes and moves. In this investigation, an exploration of the behaviour of the lines is not limited to behaviour during the weaving process. The materiality of the lines and the weight of the lines will both impact the woven structure that they create. This can be seen if a comparison is made between *To the Various Futures (Not to All)* by Andrea Donnelly shown in figure 212 and *Abakan yellow* by Madalena Abakanowicz shown in figure 213. In Donnelly's work, the fabric is semi-transparent, and despite being held on a straight rail the fabric undulates creating ripples. Abakanowicz's work is solid heavy and dense, the fold lines of the fabric correlate to the location of the wire used to hang or attach it to the ceiling. That said it is not possible to make direct comparisons about the behaviour of lines in these two works because the materiality of the yarn is not the same. What they do suggest is that the weight of the fabric influences its behaviour. To isolate and study the impact of the weight of the line on the behaviour of the fabric I will be using the same material in different weights.

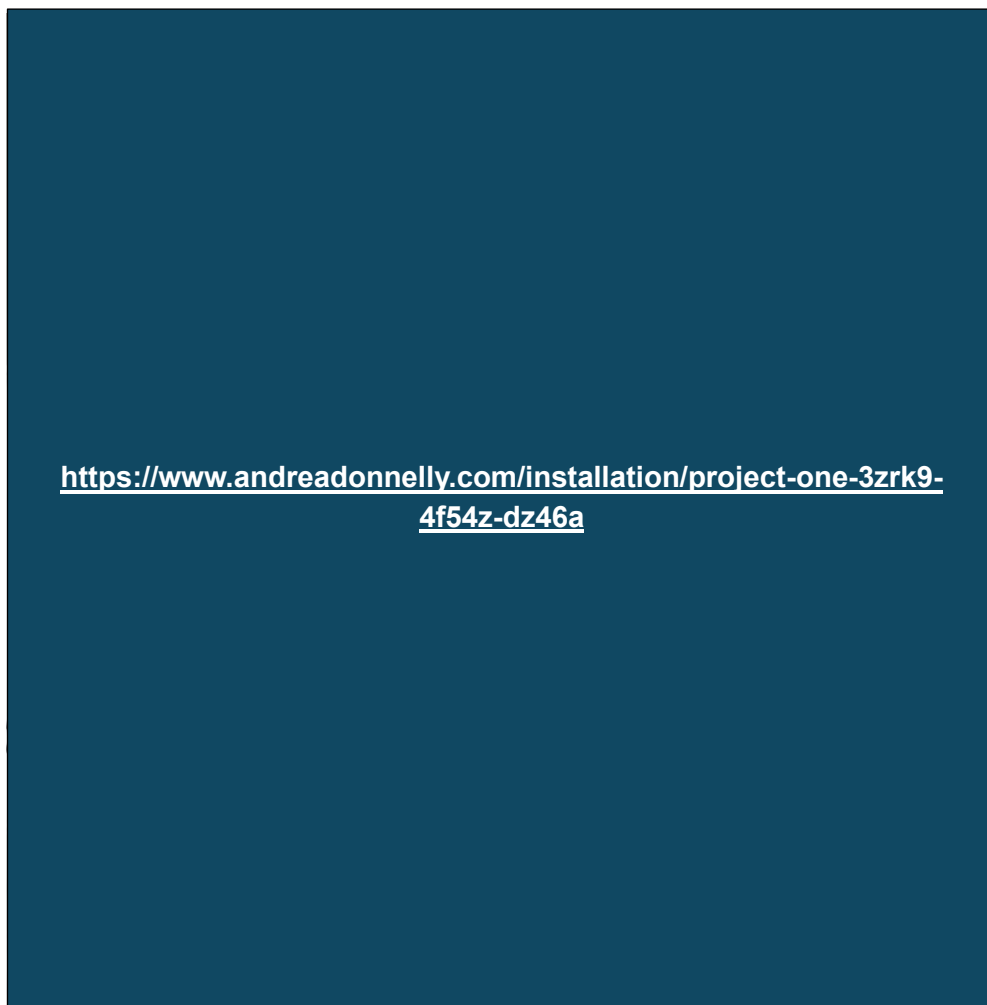
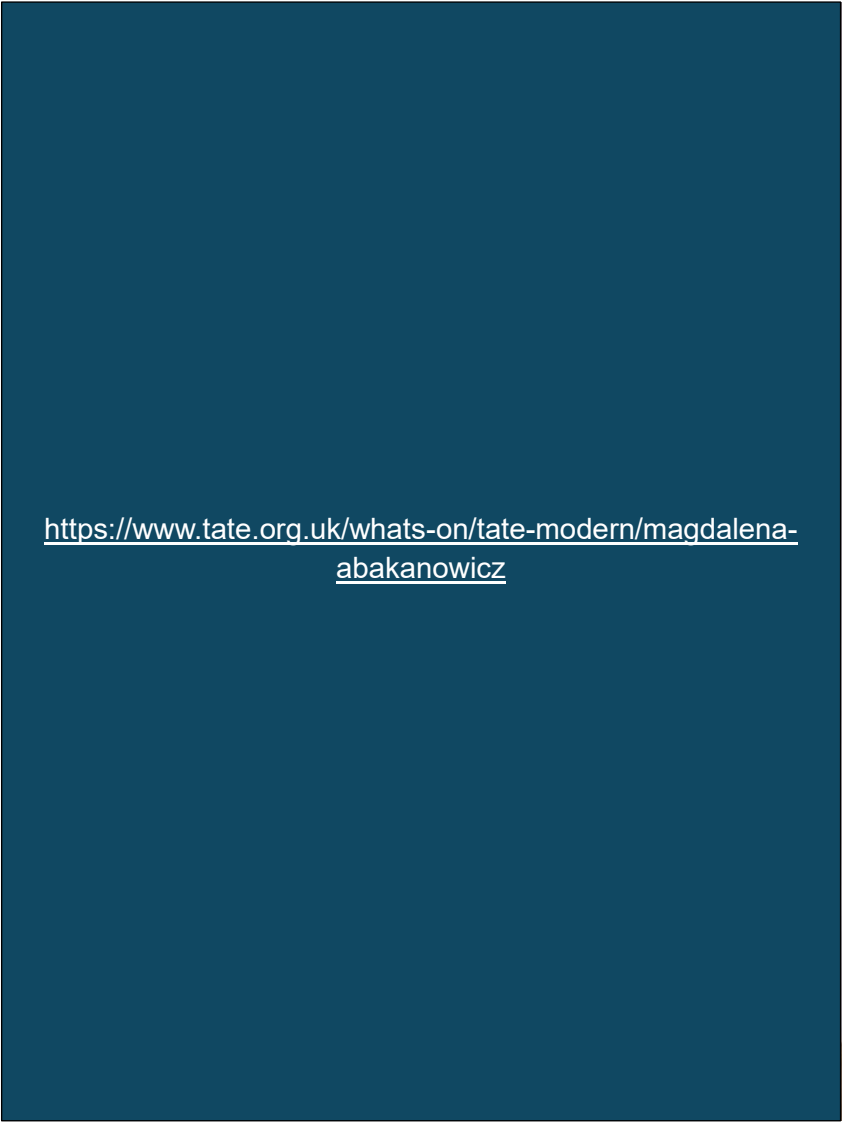


Figure 212 Andrea Donnelly, *To the Various Futures (Not to All)*, 2017



<https://www.tate.org.uk/whats-on/tate-modern/magdalena-abakanowicz>

Figure 213 Magdalena Abakanowicz, Abakan yellow, 1970

Whilst lines in a weaving can be understood as lines of yarn it is also possible to consider these lines as composed of lines. In the case of my chosen material, each line of yarn is composed of two strands that could also be understood as 'lines.' Lines have become interconnected in the creation of other lines, prior to being woven. An awareness of these lines can offer further opportunities to observe the behaviour of lines in weaving. Having access to my own spinning wheel means that I can use my choice of yarn to create other variations that can then be woven.

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Bibliography

Albers, Anni. 2023. "One Aspect of Art Work." In *Weaving at Black Mountain College*, edited by Michael Beggs and Julie Thomson. Asheville: Black Mountain College Museum and Arts Center Publishing.

Albers, Anni. 2017. *On Weaving*. Expanded edition. Princeton: Princeton University Press.

Albers, Anni, and Brenda Danilowitz. 2000. *Anni Albers: Selected Writings on Design*. Middletown: Wesleyan University Press.

Applin, Jo, Andrew Bonacina, Jennifer Higgie, and Abi Shapiro. 2022. *Sheila Hicks: Off Grid*. Edited by Andrew Bonacina. Wakefield: The Hepworth Wakefield.

Barnard, Tess Elizabeth. 2018. "SL/SH Embodiment, Liminality, and Epistemology in Relief Printmaking through the Linocut Process." PhD diss., University of Edinburgh, Edinburgh College of Art.

Barthes, Roland. 1991. "Soap-Powders and Detergents." In *Mythologies*, translated by Annette Lavers, 36–38. New York: The Noonday Press. First published 1957.

Bek-Pedersen, Karen. 2009. "Fate and Weaving: Justification of a Metaphor." *Viking and Medieval Scandinavia* 5 (5): 23–39. <https://doi.org/10.1484/J.VMS.1.100672>

Berger, John. 1972. *Ways of Seeing*. London: Penguin Books.

Berggren Torell, Viveka, and Ulla Ranglin. 2014. "Knowledge in Action in Weaving." *Techne Serien: Forskning i Slöjdpedagogik och Slöjdvetenskap* 21 (1): 22–37. <https://journals.oslomet.no/index.php/techneA/article/view/537>.

Bolt, Barbara. 2006. "A Non Standard Deviation: Handlability, Practical Knowledge and Practice-Led Research." Paper presented at *Speculation and Innovation: Applying Practice-Led Research in the Creative Industries*, Brisbane, 30 March–1 April.

Briand, Betty. 2023. *The Art of Weaving: Master the Techniques, Understand the Weave Structures, Create Your Own Designs*. New York: Rowman & Littlefield.

Buchanan, Rita. 1999. *A Weaver's Garden: Growing Plants for Natural Dyes and Fibers*. 2nd ed. Mineola, NY: Dover Publications.

Bunn, Stephanie. 1999. "The Importance of Materials." *Journal of Museum Ethnography*, no. 11 (May): 15–28. Museum Ethnographers Group. <https://www.jstor.org/stable/40793620>

Candy, Linda, and Ernest Edmonds. 2018. "Practice-Based Research in the Creative Arts: Foundations and Futures from the Front Line." *Leonardo* 51 (1): 63–69. https://doi.org/10.1162/LEON_a_01471

- Cazeaux, Clive. 2017. *Art, Research, Philosophy*. London: Routledge.
- Chandler, Deborah. 1995. *Learning to Weave*. 5th ed. Loveland: Interweave Press.
- Clarke, Jennifer. 2014. "Disciplinary Boundaries between Art and Anthropology." *Journal of Visual Art Practice* 13 (3): 220–235. Published online 6 October 2014. <https://doi.org/10.1080/14702029.2014.971557>
- Cook, J. Gordon. 1968. *Handbook of Textile Fibres*. 4th ed. Watford: Mellow Publishing Co.
- Cooke, Lynne, ed. 2023. *Woven Histories: Textiles and Modern Abstraction*. Chicago: University of Chicago Press.
- Cunliffe, Ann L. 2018. "Wayfaring: A Scholarship of Possibilities or Let's Not Get Drunk on Abstraction." *M@n@gement* 21 (4): 1429–1439. <https://doi.org/10.3917/mana.214.1429>
- Emery, Irene. 2009. *The Primary Structures of Fabrics: An Illustrated Classification*. London: Thames and Hudson. First published 1966 by Smithsonian Institution.
- Forceville, Charles. 2008. "Metaphor in Pictures and Multimodal Representations." In *The Cambridge Handbook of Metaphor and Thought*, edited by Raymond W. Gibbs Jr., 462–482. Cambridge: Cambridge University Press.
- Gauthier, Michel. 2018. *Sheila Hicks: Lifelines*. Edited by Michel Gauthier. Paris: Centre Pompidou.
- Gray, Carole, and Julian Malins. 1993. *Research Procedures/Methodology for Artists and Designers*. Aberdeen: Robert Gordon University.
- Gray, Carole, and Julian Malins. 2004. *Visualizing Research: A Guide to the Research Process in Art and Design*. London: Routledge.
- Gordon, J. E. 2009. *Structures: Or Why Things Don't Fall Down*. 2nd ed. New York: Da Capo Press. ProQuest Ebook Central.
- Hamilton, Ann. n.d. *Armory Project*. https://www.annhamiltonstudio.com/images/projects/armory/AHamilton_armory_pkg_final_full_res_public.pdf
- Hannula, Mika, Juha Suoranta, and Tere Vadén. 2014. *Artistic Research Methodology*. New York: Routledge. <https://doi.org/10.3726/978-1-4539-1308-6>
- Harlizius-Klück, Ellen. 2017. "Weaving as Binary Art and the Algebra of Patterns." *Textile* 15 (2): 176–197. <https://doi.org/10.1080/14759756.2017.1298239>.
- Hemmings, Jessica. 2012. *Warp & Weft: Woven Textiles in Fashion, Interiors and Art*. London: Bloomsbury.

Hillard, Ainsley. 2013. *Image as Structure*. Exhibition portfolio, University of Wales Trinity Saint David. Accessed September 28, 2023.

<https://repository.uwtsd.ac.uk/312/1/HillardAlmageasStructurePortfolio01.pdf>

Ingold, Tim. 2000. "On Weaving a Basket." In *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*, Vol. 1. London: Routledge.

Ingold, Tim. 2007. *Lines: A Brief History*. London: Routledge.

Ingold, Tim. 2010a. *Bringing Things to Life: Creative Entanglements in a World of Materials*. NCRM Working Paper #15. Manchester: University of Manchester. https://eprints.ncrm.ac.uk/id/eprint/1306/1/0510_creative_entanglements.pdf.

Ingold, Tim. 2010b. *Transformations of the Line: Traces, Threads and Surfaces*. *Textile* 8 (1): 10–35. <https://doi.org/10.2752/175183510X12580391270100>.

Ingold, Tim. 2011. *Being Alive: Essays on Movement, Knowledge and Description*. London: Routledge.

Ingold, Tim. 2012. "Toward an Ecology of Materials." *Annual Review of Anthropology* 41: 427–442. <https://doi.org/10.1146/annurev-anthro-081309-145920>

Ingold, Tim. 2013a. "Knowing from the Inside." In *Making Anthropology, Archaeology, Art and Architecture*, edited by Tim Ingold, 1–18. London: Routledge.

Ingold, Tim. 2013b. "Making, Growing, Learning: Two Lectures Presented at UFMG, Belo Horizonte, October 2011." *Educação em Revista* 29 (3): 301–323. <https://doi.org/10.1590/S0102-46982013000300013>

Ingold, Tim. 2015. *The Life of Lines*. London: Routledge.

Ingold, Tim. 2016. *Lines: A Brief History*. Routledge Classics edition. London and New York: Routledge.

Ingold, Tim. 2017a. "Knowing from the Inside: Correspondences." In *An Unfinished Compendium of Materials*, edited by Rachel Harkness, Aberdeen: University of Aberdeen.

Ingold, Tim. 2017b. "On Human Correspondence." *Journal of the Royal Anthropological Institute* 23 (1): 9–27. <https://doi.org/10.1111/1467-9655.12541>

Ingold, Tim. 2017c. "Taking Taskscape to Task." In *Forms of Dwelling: 20 Years of Taskscapes in Archaeology*, edited by Ulla Rajala and Philip Mills, 2–25. Oxford: Oxbow Books.

Ingold, Tim. 2019. "Art and Anthropology for a Sustainable World." *Journal of the Royal Anthropological Institute* 25 (4): 659–675. <https://doi.org/10.1111/1467-9655.13125>.

Ingold, Tim. 2021. *Correspondences*. Cambridge: Polity Press.

- Jelinek, Alana. 2020. *Between Discipline and a Hard Place: The Value of Contemporary Art*. London: Bloomsbury Academic.
- Kraft, Kerstin. 2004. "Textile Patterns and Their Epistemological Functions." *Textile 2* (3): 274–289. <https://doi.org/10.2752/147597504778052711>
- Ladbury, Ann. 1985. *Fabrics: Fully Rev. and Updated*. 2nd ed. London: Sidgwick & Jackson.
- Lakoff, George, and Mark Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.
- Latour, Bruno. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
- Lasvignes, Serge, and Bernard Blistene. 2018. "Foreword." In *Lignes de Vie: Lifelines*, edited by Michel Gauthier. Paris: Centre Pompidou.
- Lemon, Narelle, Anat Wilson, Catherine Oxworth, Agli Zavros-Orr, and Bryan Wood. 2018. "Lines of School-University Partnership: Perception, Sensation and Meshwork Reshaping of Pre-Service Teachers' Experiences." *Australian Journal of Teacher Education* 43 (10): 81–97. <https://doi.org/10.14221/ajte.v43n10.5>
- Levine, Stephen K. 2013. "Expecting the Unexpected: Improvisation in Art-Based Research." In *Art as Research*, edited by Shaun McNiff, 55–70. Chicago: University of Chicago Press.
- Miller, Edward. 1995. *Textiles: Properties and Behaviour in Clothing Use*. 3rd ed. London: B T Batsford.
- Millar, Lesley, Takeo Uchiyama, and Chiyoko Tanaka. 2002. *Chiyoko Tanaka*. Vol. 12. Tokyo: Telos Art Publishing.
- Mitchell, Victoria. 2006. "Drawing Threads from Sight to Site." *Textile: The Journal of Cloth and Culture* 4 (3): 340–361. <https://doi.org/10.2752/147597506778691459>
- Muthu, Subramanian Senthilkannan, ed. 2014. *Roadmap to Sustainable Textiles and Clothing: Eco-Friendly Raw Materials, Technologies, and Processing Methods*. Singapore: Springer.
- Nelson, Robin. 2022. *Practice as Research in the Arts and Beyond*. Cham: Springer Nature.
- Pace, Steven. 2012. "Writing the Self into Research: Using Grounded Theory Analytic Strategies in Autoethnography." *TEXT: Journal of Writing and Writing Courses* 16 (Special Issue 13): 1–15. <https://textjournal.scholasticahq.com/article/31147-writing-the-self-into-research-using-grounded-theory-analytic-strategies-in-autoethnography>.

- Pärson, Åsa, and Amica Sundström. 2021. *The Weaving Handbook: The Art and the Craft: Theories, Materials, Techniques and Projects*. London: Trafalgar Square.
- Rees, Alison Louise. 2021. "Turning the Page: A New Dimension to the Language of Ceramics with Reference to Wayfaring, Porcelain Paperclay and the Archetype of the Paper Page." PhD diss., Royal College of Art, London.
- Richards, Ann. 2012. *Weaving Textiles That Shape Themselves*. Marlborough: The Crowood Press.
- Richards, Ann. 2021. *Weaving: Structure and Substance*. Marlborough: Crowood Press.
- Sandin, Gustav, Sandra Roos, and Malin Johansson. 2019. *Environmental Impact of Textile Fibers – What We Know and What We Don't Know: The Fiber Bible Part 2*. Stockholm: RISE Research Institutes of Sweden.
- Scanlan, Jennifer. 2015. "Crafting With and Against the Grid." *The Journal of Modern Craft* 8 (2): 215–224. <https://doi.org/10.1080/17496772.2015.1057401>.
- Scrivener, Stephen. 2021. "The Art Object Does Not Embody a Form of Knowledge Revisited." In *The Routledge International Handbook of Practice-Based Research*. London: Routledge.
- Seiler-Baldinger, Annemarie. 1992. *Textiles: A Classification of Techniques*. Washington: Smithsonian.
- Smith, T'ai. 2013. "The Event of a Thread." In *Textiles: Open Letter*, edited by Rike Frank and Grant Watson. Berlin: Museum Abteiberg; Sternberg Press.
- Smith, T'ai. 2014. *Bauhaus Weaving Theory: From Feminine Craft to Mode of Design*. Minneapolis: University of Minnesota Press.
- Strickler, Carol, ed. 1991. *A Weaver's Book of 8-Shaft Patterns*. Loveland, CO: Interweave Press.
- Tanaka, Chiyoko. 2012. "Transition and Influence Projects." Accessed 28 September 2021. <http://www.transitionandinfluenceprojects.com/gallery/chiyokotanakastatement.html>
- Thompson, D'Arcy Wentworth. 2021. *On Growth and Form*. Edited by John Tyler Bonner. 7th ed. Cambridge: Cambridge University Press. First published 1917.
- Treggiden, Katie. 2018. *Weaving: Contemporary Makers on the Loom*. Antwerp: Ludion.
- Willcox, Donald J. 1970. *New Design in Weaving*. New York: Van Nostrand Reinhold.
- Wilson, Anne. 2008. "Notes on Wind-Up: Walking the Warp." Accessed 28 August 2023. <https://www.annewilsonartist.com/wp-content/uploads/2010/08/Wind-Up2.pdf>