

Materials of Resilience

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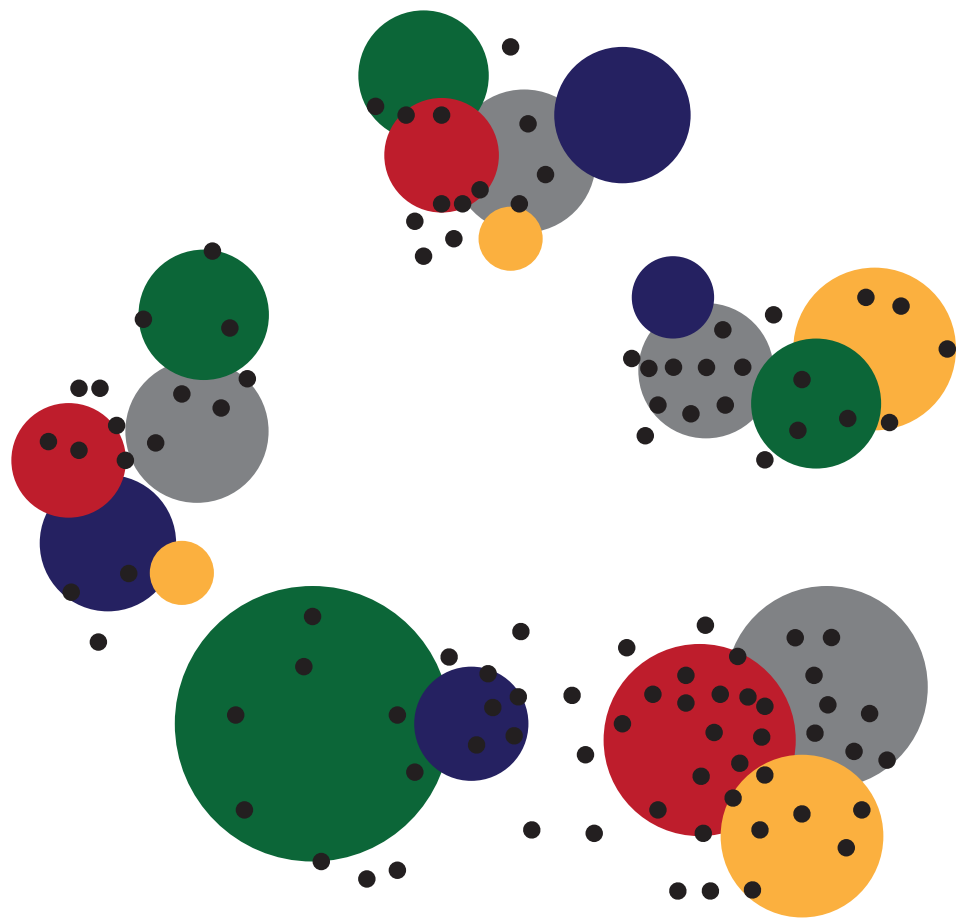


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A Note to the Reader

I would like to take this opportunity to introduce myself. In this personal introduction I detail a few influential experiences that have provided a foundation for my own ways of learning, observing, designing, and knowing. I began my journey as a maker, an engineer, a teacher, a learner, and a problem solver. The development of my practice as a designer is founded upon the principles, skills, and empathies I have developed in my previous experiences and roles. I hope that you will reflect on your own values, experiences, and expectations, and contributions as you read and, hopefully, ponder on this offering. The visual format of this document emulates that of “The Nature And Art of Workmanship” by David Pye (1971). The wide margins provided me with a unique space for reflection, note taking, and further examination of ideas, thoughts, and examples. I would invite you to take advantage of this space similarly.

Who Am I?

You may, like me, find the world in an ever evolving state of crisis. When I first started writing this document, Australia was only just beginning to control the bush-fires consuming much of the country and Puerto Rico had experienced two earthquakes in the course of a week. Now, a virus has the world in varying states of isolation and panic. Perhaps you feel the same sense of urgency that I do, that the world is rapidly changing and we are ill prepared to change with it. This document details the development of my practice as I have studied knowing through making, and identifying my own designerly ways of knowing in response to these tumultuous times.

I have not, however, always considered or called myself a designer. I studied engineering, Materials Science, and long considered myself an engineer. I have long since wanted to help change the world somehow. I continued in this vein when I lived in the Philippines, learning that change in the world comes by connecting with one person at a time, in a way that is directed by them. Other teaching experiences in autism and language learning programs served to more deeply embed the principles of aiding instead of instructing, empathy, and establishing individually directed ways of sharing and learning.

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I applied to this program with a concrete plan in mind - developing a self sustaining emergency shelter that could provide aid to the people experiencing traumatic loss. There are many issues facing those who have experienced loss and displacement. They leave behind homes, possessions, communities, and family members. I spent the first three months contemplating how could I, as a designer, construct physical systems to address such complex needs. The more I dug in, the more inappropriate it felt. Many skilled and award winning designers have attempted to address these same issues, but they consistently design at a distance. The Ikea shelter was designed in Sweden, but deployed in Iraq, Greece, and other countries.²⁴ Conversely-Shigeru Ban, a Japanese designer, has designed and successfully deployed paper constructed shelters in Japan.¹⁶

The more I read and reflected, the more I asked questions of positionality, who am I as a design researcher? An insider to the problem? Or an outsider? While in the Philippines, I was always an outsider, even though I spoke the same language and ate the same food. I lived in housing that was provided for me, I always had money for food, and I didn't have to work to protect my family from eviction, hunger, or to provide for their schooling by asking neighbors for a loan. I stayed for what felt like a significant period of time, but no matter how deep my love, empathy, concern, and focus, there would come a day when I would go home and forget their daily struggles for my own. With such physical and emotional distance, how could I possibly know what a Filipino community needs in times of great loss?

I chose, instead, to step back to where I stand as more of an insider. Where I reside and study on the unceded, traditional and ancestral **xʷməθkʷəy̓əm** (Musqueam), **Sḵwxwú7mesh Úxwumixw** (Squamish), and **səlilwətaʔt** (Tsleil-Waututh) territories. I am here as an immigrant to Canada, one who has worked to become a member of a local community for the last five years, and who has a lifetime of benefits from colonial and settler structures. I acknowledge that, just as I learned in the Philippines, there are communities here for whom it is inappropriate for me to presume that I can speak on their behalf. I also acknowledge that studying any topic in an academic setting is a privileged position, not all those who stand in need of greater resilience have access to time, space, and freedom to study and develop it.

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With these acknowledgments, I turned to an inquiry of the roots of our inability to recover from loss. I began my journey with many questions: Why do we feel such fear for the unknown? Why do we do everything we can to put up blinders to danger, to ideas and actions that would change our way of daily life? Why are we not resilient? Why do we rely so much on external sources for the solutions to our needs and problems? What do we build within ourselves that would provide us the emotional capacity, the physical skills, and mental acuity to not just be subjected to occurrences in our life, but to thrive whether in times of tumultuous change, or in times of calm and certainty?

“People who conceive and set up new solutions and those who participate in them do so by choice. Largely because of this, in the solutions they produce there are certain features that they see as better than those proposed by the mainstream, unsustainable system of production and consumption. They choose solutions that make possible what they perceive to be a higher quality of life, and one that involves less consumption (of products, energy, space). In doing so, they compensate for reduced consumption with an increase in something else that they consider more valuable” (Manzini, 2015, p. 22).

Positionality

I recognize that my work is privileged work that is unencumbered by the daily obstacles that prevent resilience- disparities in employment and quality of life, housing, social programs, etc. Some of this work, done in pursuit of a Master's degree in Design, addresses the attributes of resilience that can strengthen an individual in these circumstances, but is not proposed as a direct solution to these issues. Though this study is privileged in nature, it is not a vanity practice exercised purely out of curiosity and for self satisfaction. The rigorous material and collaborative inquiry was centered upon the definition, exploration, and establishment of the characteristics of resilience and the characteristics of material practice with the intent of translation and conversation both within and without the academic environment.

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I offer a definition of resilience as I have come to understand it through sustained making and reflection. There are inherent limitations to an understanding of resilience gained through an emergent practice in an academic environment. My knowledge was gained through the privilege of education, which is denied to many, and is built from and upon the knowledge and generosity of others as they have shared with me, encouraged me, and guided me. Writings by authors studying in North American and Western contexts aided in refining the language I have adopted in my discussions.

“Craft provides a vehicle for: investigating one’s relationships and identity within the context of place; the creation of networks of social relations leading to a ‘sense of community’ (SOC); and the creation of products, experiences and services rooted in culture and innovation that define place” (Ortiz, 2012). Craft and making are integral to establishing oneself as a part of a place. For myself, the study of resilience through making led to the establishment of myself as a Local designer. Local in that I am concerned with the long lasting impacts of my practice- do I want to choose materials or sources that damage land for others? Or do I pursue the establishment of material sources that reduce or eliminate damage? Do I design for somewhere else, where the results and consequences of my design have little impact or consequence on myself, but rather serve as “the answer” for someone whose voice I didn’t consider?

Walter Dignolo states in his writings in “Delinking: The rhetoric of modernity,” “coloniality and modernity are interlinked and suggests that West-centric design – often considered to be an offspring of modernity – needs to be ‘to de-linked’ from coloniality through a pluriversity of perspectives, or alternatives to a single reality concept. These alternatives present our world through different cultural lenses or subjective representations” (Boehnert & Onafuwa, 2016, p. 10).

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In the pluriverse there are many ways of living, doing, thinking, and acting. Arturo Escobar explains the pluriverse as “‘a world where many worlds can be embraced’, in the Zapatista dictum” (Esteva & Escobar 2017, p. 2658). Boehnert & Onafuwa describe the role of a designer in the pluriverse as “The intrinsic privilege that allies have puts them in a position to enable opportunities for more voices and different perspectives” (Boehnert & Onafuwa, 2016, p. 10). One must define resilience, or a person’s way of self sufficiency, for themselves. Having vocabulary gleaned through other studies and observations can facilitate one in defining and establishing a practice of developing resilience. There is not one way of developing resilience, but for the scope of this Master’s thesis research, the methods developed in this study are limited to observations conducted in a Western context with the intent of application in Vancouver. I have built my home in this region and it is only here that I can establish and apply my own local knowledge.

Resilient systems often don’t have a base state that they constantly return to. The definitions of resilience put forward here are one iteration of knowledge generation in an emergent research practice. It is my intention that this work invites discussion and exploration through many different vernaculars, cultures, and circumstances. I can only, however, speak for that of my own experience and to share that of the people who were gracious enough to share with me theirs.

I would also like to give a special thank you to the many people who have supported me in this journey of establishing a new practice.

Thank you to my partner in crime, my husband, Benjamin, for not making faces with every new crazy idea I wanted to try.

Thank you to Keith Doyle, my supervisor, who has always been supportive, kind, and generous in guiding and advising me.

Thank you to the graduate studies faculty and sessionals who give genuine concern, without whom, navigation of emergent practice would not have been possible.

Thank you to my cohort, friends, and collaborators.

All of you are part of my resilience, now, and moving forward.

Glossary of Terms

Positionality- self scrutiny of the researchers' emotions, subjectivities, lived experiences and world views. (Keikelame, 2018)

Expert design- "What may at first glance seem neutral also reveals underlying assumptions and prejudices resulting from social distances between designers and the diverse audiences and users of design communication, artifacts and services." (Boehnert & Onafuwa, 2016, p. 6)

Knowing through making- doing and making comes before knowing. "The practitioner-researcher creates an artefact and also documents, contextualises and interprets it along with the process of making it." (Mäkelä & Nimkulrat, 2018, p. 2)

Material practice- "In craft practice, the maker generates a form as a means of transforming the material through bodily movements, sometimes accompanied with tools." (Aktaş & Mäkelä, 2019, p. 56)

Practice-led research- "In design research, for example, the emphasis is on understanding the nature of practice and how to improve it rather than creating and reflecting on new artifacts... practice-based research is an original investigation undertaken in order to gain new knowledge, partly by means of practice and the outcomes of that practice" (Candy, 2018, p. 63).

Research through design- "Creative production can be understood as a research method." (Mäkelä & Nimkulrat, 2018, p. 1) The research through design method is characterized by a cycle of action, or inquiry, followed by reaction to the outcome. The reaction then serves as a prompt for the next action or inquiry. Reflection in action and reflection on action are a key in initiating the next phase, or repetition, of the cycle.

Consumptive- "tending to consume" (Merriam Webster Dictionary) Here it is used as a descriptor of consumers habitually using and disposing of goods and resources.

Keystone habit- habits that have a chain reaction "The habits that matter most are the ones that, when they start to shift, dislodge and remake other patterns." (Duhigg, 2014, p. 101)

GLOSSARY

Resilience- the ability of a person, community, or system, to adapt to change, and to maintain one's core self and function in spite of adversity.

Scarcity- being in short supply, this is applied to a limitation on materials, tools, or resources.

Well being- the condition or experience of health, happiness, and prosperity.

Critical reflection- "Critical reflection is a 'meaning-making process' that helps us set goals, use what we've learned in the past to inform future action and consider the real-life implications of our thinking. It is the link between thinking and doing" (Waterloo University).⁵

Local designer- a designer who has developed local knowledge, or knowledge is rooted in the maker and originates from a specific locality (Ortiz, 2012). The designer utilizes and grows that knowledge for, with, and within the locality that they are positioned and invested in.

Personal value system- The system by which an individual allocates value to the objects, actions, and occupations in their life. "Design is a primary means through which people distinguish themselves and display class allegiances. The design industry thrives on the fact that people regularly pay more for items that signify class pretensions." (Boehnert & Onafuwa, 2016, p. 7).

Vernacular- Material or practice found within a specific locality.

Circularity- system, often economic, focused on eliminating waste and the continual recirculation of materials and goods. Circularity of materials and goods need to be part of the design (US Chamber of Commerce Foundation).²⁰

Reformatting- re-arranging or re-contextualizing.

Waste- A mis-identified resource of the non-hazardous variety, this research includes consumer goods that would be disposed of through landfill or secondhand industries.

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Distributed Network- Robin Murray has described distributed networks as, “I describe it as a ‘social economy’ because it melds features which are very different from economies based on the production and consumption of commodities. Its key features include: The intensive use of distributed networks to sustain and manage relationships, helped by broadband, mobile and other means of communication. Blurred boundaries between production and consumption. An emphasis on collaboration and on repeated interactions, care and maintenance rather than one-off consumption. A strong role for values and missions.” (Manzini, 2015, p.15).

Global Economy- System of industry and trade around the world (Cambridge Dictionary).

Globalization- Growth of trade and industry around the world, characterized by global distribution, centralized areas of manufacturing and production, and (Investopedia).

Growth Economy- The measurement of economic growth through the Gross Domestic Product (GDP), or the value of goods and services produced in a country in a year. A growth economy requires GDP to be continually increasing (Simms & Johnson, 2010).

Place-based Economy- “Some are re-visioning, fostering new identities by turning to place-based economies where community is now the organizing principle. Movement in this direction is founded on the growing recognition that wealth is generated by developing local assets.” (Ortiz, 2012, p. 23).

THE INTRODUCTION

1 What is Resilience and Why Does it Matter?

“To improve your resilience is to enhance your ability to resist being pushed from your preferred valley, while expanding the range of alternatives that you can embrace if you need to.” (Zolli & Healy, p7)

Resilience is our capacity to weather and adapt to change while retaining our foundations. These foundations constitute our behaviors, our needs, our abilities, and our connections. Andrew Zolli and Ann Marie Healy describe in their book “Resilience: Why Things Bounce Back” events where environments and circumstances change, and that these changes may prevent us from returning to the environment or state that we had previously inhabited. “Once forces have compelled you into a new circumstance, it may be impossible for you to return to your prior environment” (Zolli & Healy, 7). Resilience is how we adjust to these changes, and how we establish a new normal.

What Prevents Our Resilience?

The lifestyle we are encouraged to live is based upon principles of meeting our needs through purchases. This is a highly colonial structure, built upon notions of others having what we need or desire and seeking out the means to obtain what we want. In “Thing Theory” Brown rightly identifies that we have fetishized our possessions, we have totemized them and isolated their function and value as being singular and finite (2001). When we tire of the object, we dispose of it, and seek a replacement. It has become unnecessary in our consumptive culture to keep objects as valued things. We have become over inundated with possible purchases and ownerships that we are forced to oscillate quickly between valued and discarded, fashionable and outmoded. The overwhelming wealth of product and goods makes it nearly impossible to allocate value to possessions and surrounding objects. There are numerous parties that benefit from our inability to accurately value objects and goods, much less comprehend the real cost of those goods to us on the individual and global scale (Humes, 2013). We have little part or place in the material significance, construction, or value allocation of the goods we consume.

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This fetishized relationship with the material goods around us stands in direct opposition to the development of resilience. We have become reliant upon external sources for goods, value, social standing, and perception of well-being. We are conditioned to crave products, whether they are helpful or harmful (Duhigg, 2014). We buy goods to sustain our emotional well being, to address our needs, and to fulfill our social status expectations. We build our social affiliations through goods- phones, shoes, clothing, homes, cars (Brown, 2001). The more money spent on goods and services, the better a nation is perceived to perform in the global economy (Humes, 2013).

Not only are our global systems oriented around our consumerist dependencies, but the resources needed to meet the growth needs of current populations on the earth for one year take the earth 18 months to generate (Daly, 2008; Simms, 2010). We have outpaced the ability of the earth's ecosystems to replenish the resources we rely on for growth. Should disaster come calling, we stand to lose what we feel provides us with comfort and stability - the objects we've surrounded ourselves with - and leave us waiting for someone else to provide for our recovery. What reserves do we collectively have in place to withstand an ever changing, and ever more tumultuous world? How do we shift our value systems away from mass consumption towards careful production, use, and care for the goods we need, and not just what we want?

How Do We Begin to Build Our Resilience?

To begin, we must consider how we perceive our experiences, negative or positive. Our perception of our circumstances and experiences has a direct impact on our well-being during the experience, and after. Natalie Merrill and her team in the Department of Psychology at Emory University conducted a study of students and the way that they viewed traumatic experiences. They found that when an individual recounts a positive or negative experience, how they reflect or express the ending, positively or negatively, can have a direct correlation with how they view themselves, and their psychological well-being (2016).

THE INTRODUCTION

Sujane Kandasamy, et al, studied doll making with Indigenous communities, focusing on developing the ability to address challenges, and aiding in the recovery from trauma. They found that traditional art from crafting can aid in reducing disruptions in cultural continuity, and lead to an improvement in the well-being of the social, spiritual, emotional, and cultural needs of an entire community (2016).

Mina Huotilainen, et al, studied the neuroscience of making and material play. Challenges propagated through working with material have the potential for failure, and adequate emotional capacity is needed to make sense of these challenges. Arts and crafts provide safe space to practice failure and the reinterpretation of failure as knowledge generation. The ability to navigate failure also leads to accessing innovation and exploration as a way of working past the unanticipated or undesired. It also allows for thinking outside of 'right' or 'wrong' interpretations of outcome (2018).

Physical activity, such as those involved in learning and executing making, is also connected to cognitive development (Toussaint & Meugnot, 2013). Emotions are a central part of our cognition (Damasio, 1999) and are needed in our sense-making processes (Johnson, 2007). The process of learning an art or crafts is built in part on imitating the actions, motions, or processes of others (Huotilainen, 2018). Imitation and mirroring others builds our capacity to connect with and understand others (Gallese, 2001).

Studying Resilience and Material Practice

Practice-led research and research through design were used as the methodological grounding of this inquiry and all pursuant material and collaborative exercises. Making constitutes the momentum and body of research in practice-led research. Graeme Sullivan defines it as a practice of moving through the "unknown to the known", whereby new knowledge is generated and can change what we do know (2009). Critical reflection and reflective action then contextualizes the work by teasing the research back through to establish the new known from the investigated unknown (Huotilainen, 2018). Maarit Mäkelä refines this as "knowing through making" and that "'doing and making', is prior to understanding (2007).

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The research is presented as three phases, firstly, the characterization of resilience as explored through material practice. Heuristic making, making as reflection, disassembly as learning, collaborative making, and reflective writing are used as the primary methods.

Secondly, the characteristics and actions of practice as constructed through the emergence and definition of a resilient design practice. This emergence was structured by the characterizations of craft by both David Sennett and Richard Pye. The actions conducted were grounded by questions regarding what constitutes a resilient design practice.

Thirdly, this course of research explores making as a mode of reorienting personal value systems by connecting the actions of practice that are corresponding to characteristics of resilience. This is presented through the design of a series of exercises compiled in a workbook. The discussion then leads to the position of a resilient designer as a Local Designer and the benefits of adopting resilient practices in individual practices and the potential to extend outward as distributed networks (Manzini, 2015).

2 Characterizing Resilience and Practice through Making

What is practice-led research? Lisa Grocott describes it as, “The crafting of a research program that enhances feedback calls for multiple research activities, the consideration of the subject from multiple perspectives and the communication of the research through multiple modes. The multi-faceted nature of this research program may not lend itself to pre-determining the research direction yet it can tap into the cognitive discipline a practitioner brings to the act of designing” (2018, p. 16).

Each act of doing as research was initiated by a line of inquiry, or a series of questions. As Grocott describes, the intention of the research was always in place- the development of resilience. The direction, however, was led by making. With each act of making, a series of questions were unearthed through reflection that led the inquiry to the next. Advances in practice occurred through experimentation, response, reflection, and iteration.

The emergence of my practice followed two phases. The first pursued the characterization of resilience through material practice. The methods used were reflection and reflective making, heuristic inquiry, and collaborative making.

The second phase pursued the characteristics and actions of practice. These were constructed through the emergence and definition of a resilient design practice. This emergence was structured by the characterizations of craft by both David Sennett and Richard Pye. The actions conducted were grounded by questions regarding what constitutes a resilient design practice.

These two phases are summarized through reflection on the actions of practice. These actions of practice provide the foundation for the synthesis of resilience and material practice in the discussion.

2.1 Reflection Through Doing: The Act of Unmaking

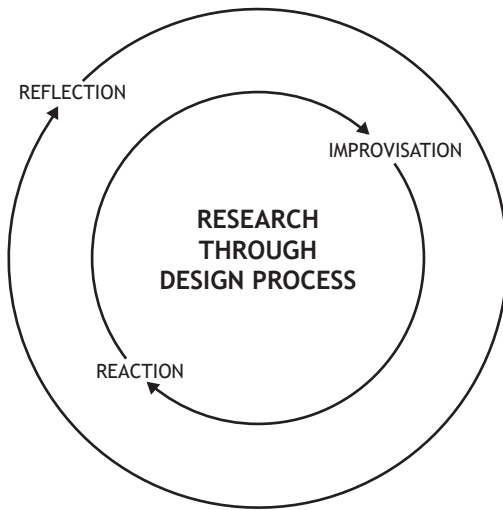


Fig. 1- Research Through Design cycle

There is a distinct division between self-indulgent material play and practice-led research and research through design. This division lay in the utilization of reflection. Glanville describes the process as learning continuously, and modifying subsequent action through reflection on the previous (2015). I found that reflection serves as the bridge between the bodily connection with material, and the mental connection with the body or the material as I disassembled sweaters. Each sweater became both an act of material re-appropriation, and a deep space of grounding and mediation that broke up the mental intensities of navigating a multi-disciplinary space.

Sennett contextualizes this reflection space as the importance of learning when to let go (2008). This allows one to step back, leave the trouble to rest, and come back with fresh eyes and intentions. Zolli & Healy address space taking as part of replenishing the finite emotional currency an individual has to expend. They position mindful meditations as a mode of grounding oneself and renewing the balance of emotional currency (2013).

In the act of deconstruction, the complexities of a knitted garment began to embody the ideas I was contemplating. Sennett described something similar wherein we become so bodily invested and engaged in what we are making or working with, that we become the thing on which we are working. We cease to be self aware and become engrossed in full with the action of making (2008). It was in this space of “being as a thing” that I was able to reflect, to contextualize, and to both figuratively and literally tease out the ends of ideas from the body of the sweater I was dismantling.

Being as a thing, in turn, transitioned into a curiosity regarding the object I was disassembling. The reflective moments facilitated by unmaking led into the study of the craft embodied in the garment. I was not able to be present for the sweater’s creation, to watch the maker in motion, observing their movements and their peculiarities. Though I could, in pieces, surmise the dance of material negotiation and study the marks of their work.



Fig. 2- Step One of Disassembling a Sweater: Identify the seams of the knitted sweater. Turn the sweater inside out. Check the shoulders and under the arm, along the arm and down the sides of the front panel(s). Check if there is a collar, pockets, or any removable components.

As a designer with a material practice, it felt painful to spend long durations of study without the interjection of making and material learning. Unmaking as reflection served as a method of connection between material, social, philosophical, and emotional navigations. The grounding invited a regular connection with material. I was able to explore ideas through knot picking, think of how my hands felt entangled in yarn instead of fretting, and develop a gratitude for the partnership of material and craft- from the knit and assembly, to the work and treatment of the fiber.

These acts of embodiment and reflection were carried out throughout the entirety of the inquiry, serving to ground material practice and exploration to reflection.

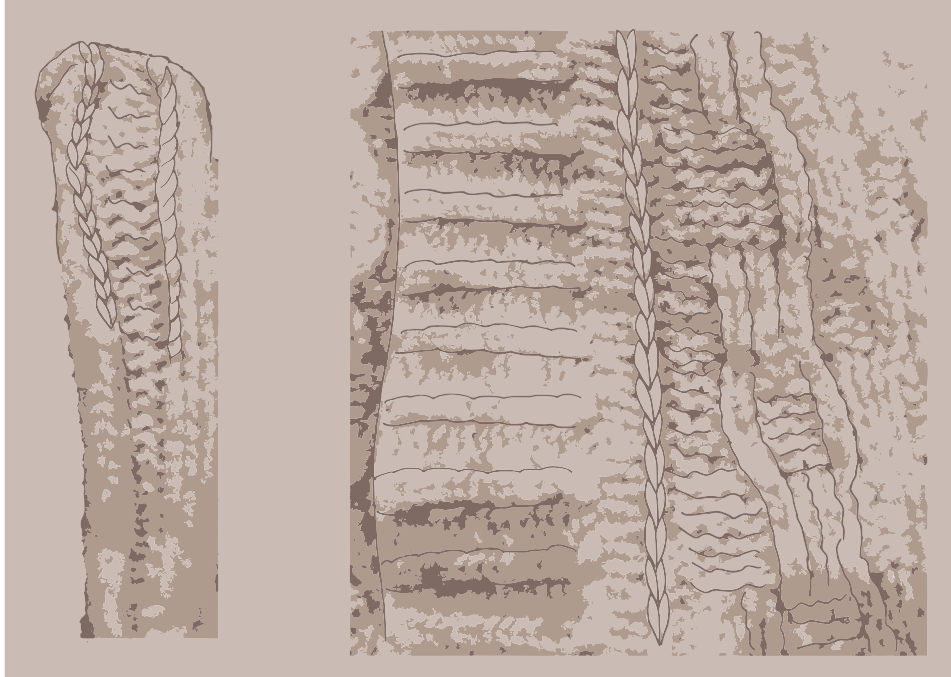


Fig . 3- Step 2: Once you have identified the different components, seams, and removables, look along the seams for the stitching. Many sweaters are knitted together, if you find the knitted seam - see outlined chains on the left - you can pull the seam out with one string. The direction of the seam points up along the V. Start at the top of the V, find the tail, and pull gently.

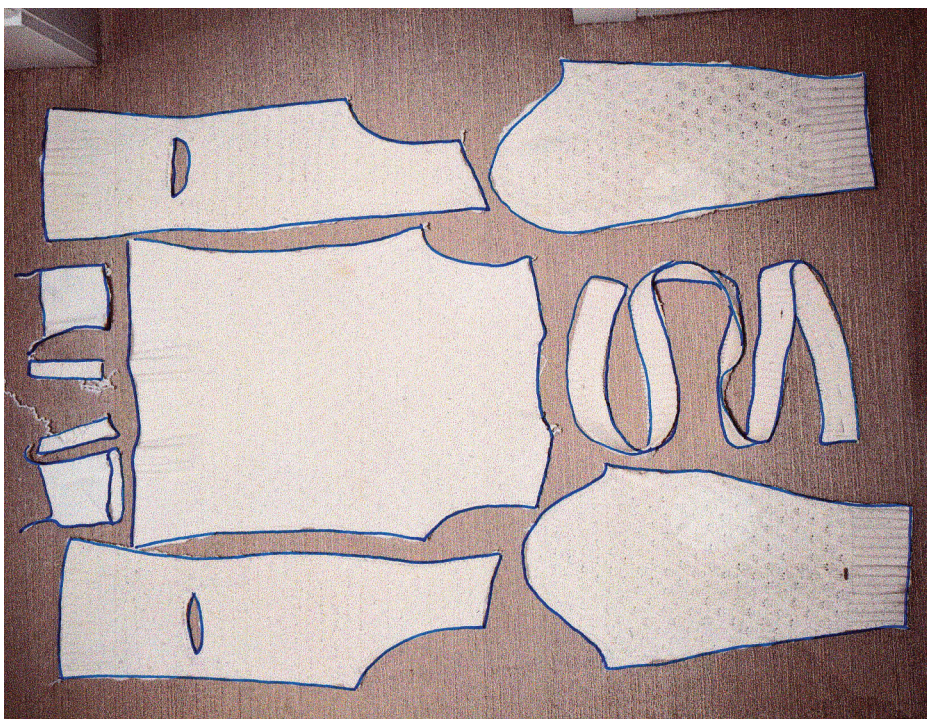


Fig. 4- Step 3: Remove all components, panels, buttons, pockets, etc. Choose one component to start with and begin unraveling.



Fig. 5- Step 4: Look at your selected component, what direction to the V's of the knit face? You might also see them as little hearts lined up. The side with the top of the heart, or V, will have a chain you can pull out. Find the tail and pull gently. Different colors may be tied together in a single line, or they may be knitted in overlapping lines.

Fig. 6- Gently wind the yarn you have unraveled around your hand and store for later use.



2.2 Heuristic Inquiry: A Blue Tarp



Fig. 7- Spanish Banks beach in Vancouver, BC. Blue tarp structure featured in distance.

I set out to emulate improvisational acts with the intent of providing for a need. Having had a childhood of camping, making and building, and being comfortable caring for my needs outdoors, I needed to step outside of myself in order to observe and study my actions and choices. I wasn't simply venturing out to confirm that I did indeed know how to build a structure. I needed to convey the experience of encountering a new environment and building with what was available to someone who had never done such a thing before.

I did not want to erase my previous experiences in making. I did, however, need to translate my knowledge into an emulatable process. I brought a knife, a blue tarp, string, and a few pieces of bamboo. I also brought a camera and my phone for audio recording. These observational tools would allow me to make with limited interruption, and to use verbalization as a method of sorting and reflection.

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

Fig. 8-Assemblies of driftwood providing the framework for tarp shelter



Fig. 9- Assemblies of driftwood, small pieces used to anchor down the A-frame side.



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I had hopes that the beach had not been overly groomed, and that my journey would lead me to a comfortable shelter on the beach. I parked and conducted a survey of the area, encountering signs barring entry or use of collected driftwood. I moved closer to the water, where no such signs existed, and took stock of the available material.

The basic form of my shelter was formed with the most easily utilized pieces of driftwood. Two large pieces were already rested next to one another and were used as an anchoring for a small A-frame. I made several trips along the beach, identifying new pieces of driftwood that were usable with each pass. Bits of string and smaller pieces of driftwood held the tarp in place over the frame. The windy and cold day prompted small evolutions of form. I negotiated the position of the tarp to provide the most coverage against the wind, pulling one side of the tarp closer to the ground on the east side.

The iterations were small, but purposeful, and improvisations occurred in how I decided to attach the string to the tarp or to the driftwood. Some driftwood was too large to shift, so I pulled lengths of the soaked bark up to wedge the string into the body of the log and tie it to secure.

Improvisation proved the most crucial aspect of responding to the limited materials available. The beach became my collaborator as we negotiated materials, the elements, and my pre-existing comfort with knots and informal making.

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

Fig. 10 (Opposite page)- Assembled shelter using blue tarp, driftwood, and string.

Fig. 11 (Top Right)- Blue tarp secured to driftwood branch using hitch knots.

Fig. 12 (Bottom)- Interior of shelter, the opening faces away from the wind, a seat was made out of smaller pieces of dry driftwood.





Fig. 13- Blue tarp and car door, anchored to the grass using paperclips and lifted by two small pieces of bamboo.

My making, combined with mild pneumonia, then took me to my neighborhood. Positioning myself on traffic island had little other purpose than to give me the opportunity to make my neighbors slightly uncomfortable, and to prompt the question “What does it look like when we improvise with all of our available resources?”

These improvisational and situational investigations resulted in a series of questions and observations- How do I approach improvisation with limited materials in an unfamiliar environment? What do I learn about the process of evaluating materials and environment?

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING



Fig. 14- View of the car-tarp shelter in front of neighborhood houses.

Fig. 15- Testing the shelter, both my feet and my head were uncovered, the gap between the car and the curb made it difficult to use the car as a back rest. Would not recommend in a pinch- just sleep in your car.



Evaluating Your Environment

What do you see? Are there useful forms?	What can you build with? Categorize them
Hypothetical Structures What can I build?	Tips: Building Shapes
	<div data-bbox="727 909 927 1031"></div> <div data-bbox="727 1037 927 1159"></div> <div data-bbox="727 1165 927 1287"></div>

I began labeling, tracing over images of the shelters, and writing in order to sort through the processes involved in addressing a new environment and collaborating with the environment to build a shelter. I tracked through my thinking process, noting the points where I paused, where I asked questions, and where I made decisions. I organized these pauses, ideation, and decision making points as short prompts with space to record. The format emerged as an observing and making exercise in the shape of a field journal (See Fig 16).

This field journal prototype prompted another series of questions. What is the most effective way to guide someone through an improvisational making process? What tools do they need, literally and figuratively, in order to recognize what is useful and what is possible? I recognized that making with an environment is an active, collaborative process. Making a plan and execution are two separate acts that involve different types of thinking and acting and require observation for the first, and negotiation with the space and available materials in the second.

Fig. 16- Template prototype of a field guide for improvisational making

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

2.3 Making With Others- Locality Through Making

Local knowledge is built through acts of making in a specific locality (Ortiz, 2012). A locality is constructed of materials, environments, and inhabitants. In order to build holistic local knowledge, one must pursue collaborative acts to gain and embody local knowledge through both the outcomes of the collaboration and connection between collaborators. Local knowledge was built through multiple collaborative exercises. These collaborations consisted of facilitation of making, discussion, and reflection on how material practices and resilience building behaviors can be initiated. Appendix A and the following section document some of the more influential acts of collaboration conducted in this research.

2.3.1 Collaborative Prompts

In the early phases of my research I had explored acts of making in a community through peer studio based workshops. Observations of behavior in a collective led to the question of what types of prompts initiate acts of improvisational making.

I extended an invitation to Jean, one of my classmates, to follow one such prompt as part of a knowledge exchange we had proposed- collaboration through request and response. I provided a tarp and a small written prompt.

How do I start?
Sketch what you see?

What is useful? interesting?
What could you choose?

What could you use in addition to the tarp?

- Choose one, or more, from the above
- Hold them, play with them, test them out
- Set a time limit
- make your replacement, try it out and adjust

• choose something you use every day
• modify the tarp to take the place of that object
• cut, rip, sew, tie, tape, staple
• Use it! Document! #t.a.r.p.
• Take your modified tarp and repeat the process somewhere New!

WELCOME TO

TARP

Take a look around you
Assess what's there
Reach out, grab something
Put your tarp together with it, make something New!

Fig. 17 - Scanned copy of the prompt extended to Jean, building upon the principles explored in the field guide prototype.



Fig. 18 - Jean in her improvised tarp jacket. She wore the jacket for most of the day.

Jean received a tarp and the prompt. The prompt instructed her to use the tarp to replace, by making, one object in her life that she used regularly. Jean, prior to opening the prompt, had presumptively decided how she would use the tarp- as a tarp in her balcony. She had to adjust to the unexpected nature of the prompt and was invited to reconcile the tarp not as a tarp, but as a material for building and making with. Jean mentally established a set of personal rules and expectations for her making. She determined she needed specific materials and tools before she could begin the process. As time passed, the due date of our exchange pushed her to realize that she was able to use materials and tools she already had- provided she altered her plan. Her pre-existing skills and knowledge supported her making process and she elected to use a minimally invasive approach to the tarp and construction of her jacket. She was pleased to share her experience on social media, and enjoyed the experience of wearing her made object on the train to and from the school.

Jean is a designer, though not a regular maker. She has had making experience, and had been a willing participant in previous making exercises and invitations. The results of her prompt reaction led to a few realizations. The nature of our relationship with materials and objects can determine how we view the purpose and potential of how they can be used or modified, and the use of pre-existing skills are a means of adapting when our plans change.

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING



Fig. 19 - Jean sharing her making on social media

MATERIALS OF RESILIENCE

2.4 The Emergence of a Practice

“All levels of organization, from the floor under your feet to global orchestration, can be centered on resilience, and questions of direction, structure, and method can be worded to address the deeply rooted question “How do we ensure our personal resilience in the face of life’s inevitable hardships?” (Zolli, 2013, p. 15).

Understanding what constitutes a material practice is how facilitation, making, and design connect. By understanding the actions that constitute practice we can begin to affirm the corresponding characteristics of resilience. The emergence of my practice followed Richard Sennett’s description of intuitive leaps through reformatting, surprise, gravity, and adjacency. Reflection in action guided the progression of material explorations and meditative reflection grounded each action in a version of the question posed by Zolli and Healy in the above quote.

“How do my decisions as a designer and maker contribute to myself and my community becoming more resilient?”

In the early stages of my research I sought to address this question through the reformatting of existing materials, specifically waste, as new materials. There were two events that directly impacted and altered the trajectory of my practice in this space. The first was my proposal to use reclaimed knit sweaters with the technology housed in the TARP lab to produce felt for a Winnipeg warming huts submission. The second was the occurrence of a fire in the Emily Carr building, an event that closed the wood shop for over a month. Adaptation within these two events led the redirection of making in the wood shop to focus on available facilities, namely the felting machine in the TARP lab of Material Matters that was unaffected by the fire and water damage.

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

2.4.1 What Is Felting?

Felting is the act, whether by heat, water, and agitation, or by physical manipulation with barbed needles, that ordered fibers are entangled and tightened into an irreversibly entangled material. The following illustration details the process of felting through the use of an industrial felting machine.

Fig.20 - Yarn unraveled from a sweater is wound around the hand (see Fig 6). The wound yarn is then cut in half, with a few lengths left longer.



Fig. 21 - Yarn from several sweaters is arranged on the felting machine bed in color groupings. The yarn is then lightly kneaded with the longer yarn lengths. The intensity of the kneading, if any, determines the color distribution.

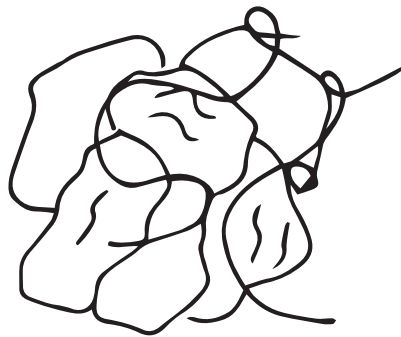
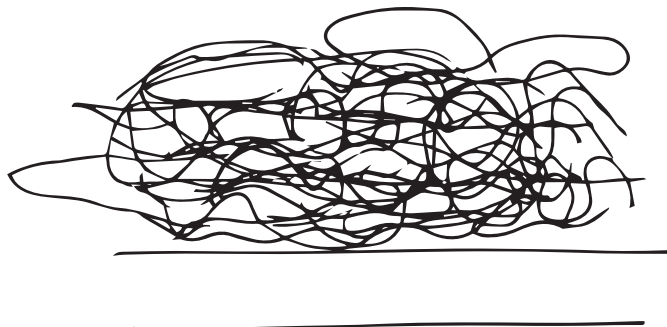


Fig. 22 - Side view of yarn on the bed. Yarn with thinner gauge yarn has a lower volume of fibers available for felting.



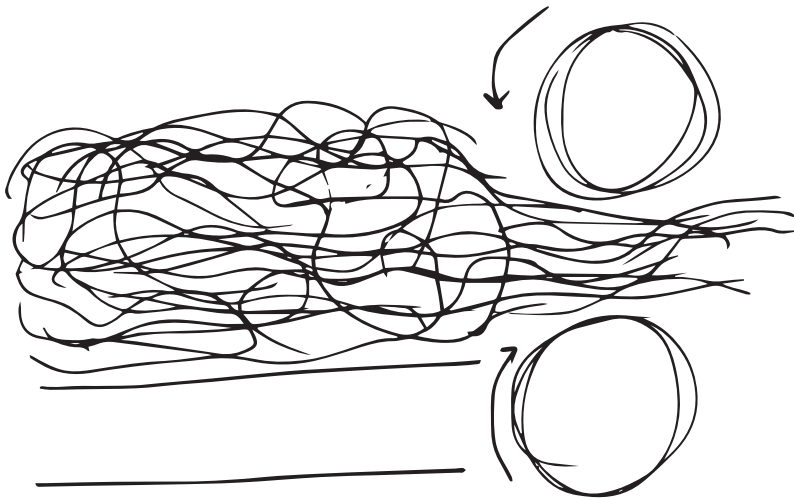


Fig. 23- The yarn on the bed is fed into the machine rollers. The rollers press and pull the yarn into the machine. The rollers have small teeth, so the maker must use their hands to compress and press the yarn into the rollers

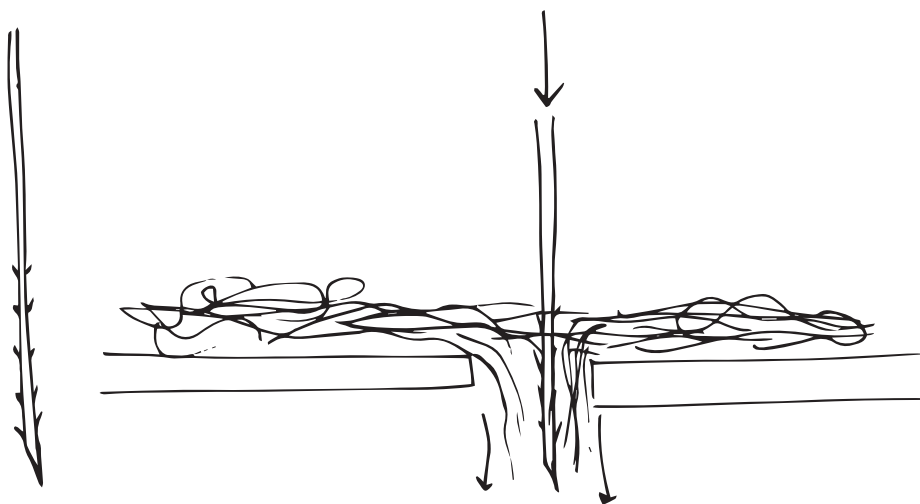


Fig. 24- As the yarn enters the machine it encounters a series of barbed needles (see on the left). As the needles move downward, the fibers around the needle are pushed downwards, breaking the direction of them as they entered the machine

Fig. -25 As the needle goes up the opposite facing barbs on the needle pull fibers upward, tangling the fibers further with each needle movement.

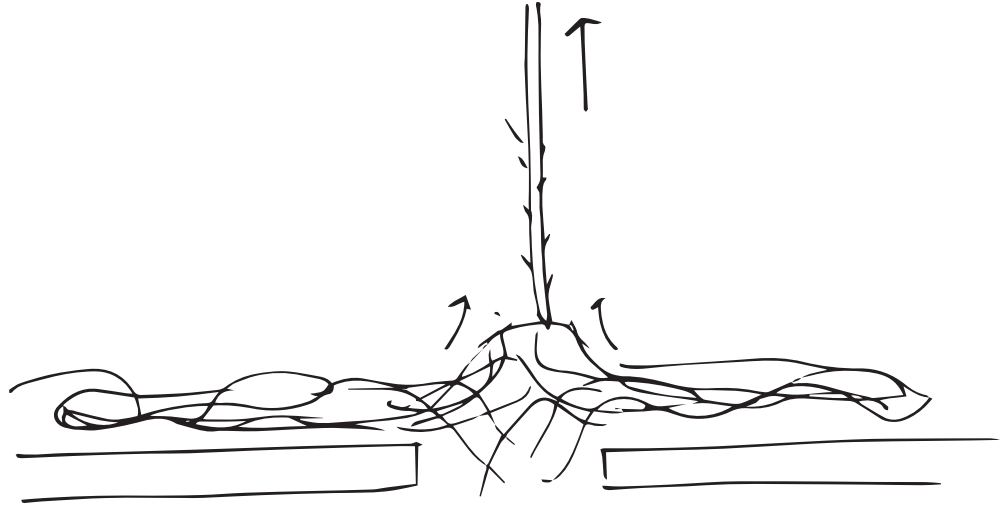


Fig. 26- The needles of the machine are attached to a plate that moves up (Top) and down (Bottom), the needles pass through a plate at the bottom with holes in it, allowing the felting action of the needles to occur as the material passes through

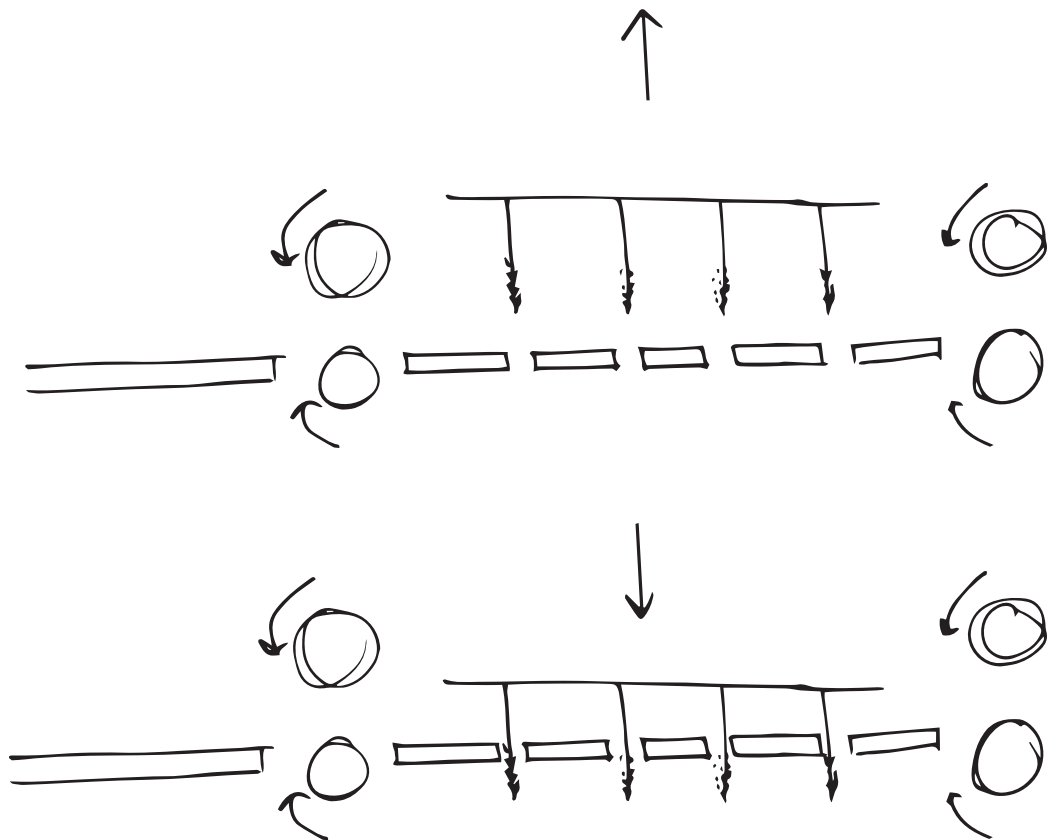




Fig. 27- Piles of cut, unraveled yarn, both 100% acrylic.



Fig. 28- Acrylic yarn arranged on the felting machine bed. Once the machine is turned out, hands will be needed to press the yarn down enough to be pulled through by the rollers. Any gaps in hand-work will lead to gaps in the felted sheet



Fig. 29- (Top) Yarn in partially felted sheet, the yarn on the bed has passed through the felting machine one time. Patching occurs during almost all passes

Fig. 30- (Right) Completed felted sheet, the yarn has passed through more than 10 times.



MATERIALS OF RESILIENCE

2.4.2 Collaborations with Material- Reformatting Tools for New Materials

The first act of reformatting occurred through the availability of the felting machine for research. Ideas of fabricating our own felt were floated around the lab as a result. When the proposal for the warming huts competition brought up the use of felt, I posited the question of using textile waste, namely sweaters, to create the felt. The question was prompted by reflections on what constitutes a resilient choice in design- how do we address the goods and materials that already exist before we seek out new material? Sennett describes reformatting as taking a familiar practice or tool and applying it in a new fashion. Felt typically uses new wool and my perception was that the integration of synthetic or non-wool materials would potentially reduce or prevent the wool's ability to felt.

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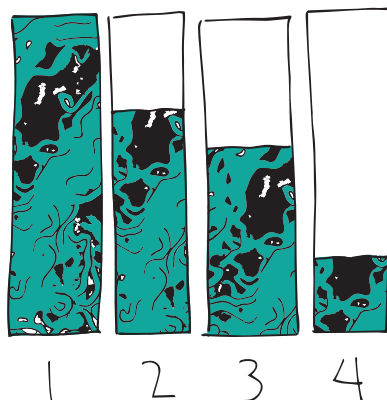


Fig. 31- Content of sweaters tested.

- 1) 100% wool;
- 2) 75% wool/25% acrylic;
- 3) 40% angora/20%merino wool/40% acrylic;
- 4) 20% wool/80% acrylic



Fig. 32- 100% wool sweater in the process of disassembly. The yarn gauge is quite small so it would benefit from mixing with larger gauge yarn. The colors, however, do not blend with others on hand.



Fig. 33-Felted sweater sheet- No other sweater yarn was included. This is the result of mixing and kneading yarn fibers to pull the longer yarn lengths out and through the whole- exaggerating what the machine would have done without intervention.



Fig. 34- Pattern making, bridging disorder and order. Pattern assembled from squares of a knitted merino wool and cashmere sweater with thicker gauge 100% wool unraveled yarn.

The squares needed multiple passes in small batches to felt together at the corners

MATERIALS OF RESILIENCE

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Fig. 35- First full sweater test in the felting machine. All toggles were removed and the sweater inserted as flatly as possible.

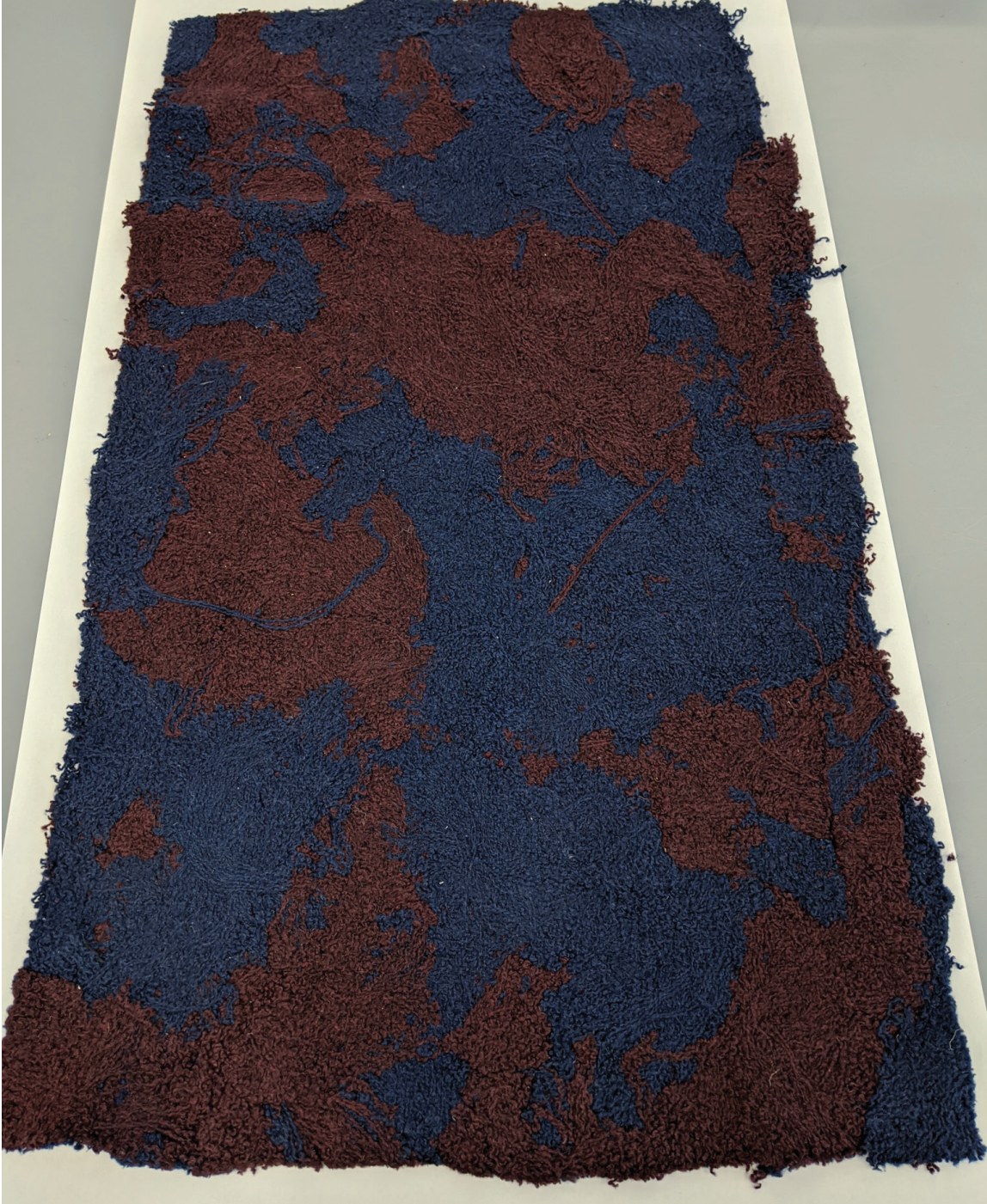


Fig. 36- Mixed blend wool sweater sheet, 50% acrylic, 25% polyester, 25% wool. The soft and inviting texture is due to passing the sheet through the machine only 10 times. It is loose in some places and has not been fully patched.

MATERIALS OF RESILIENCE

2.4.3 Collaborations with Material- Surprise, Intuitive leaps, and Knowing Through Making

Testing sweaters to determine what content of wool was required for a felted sheet to be fabricated was the next logical step in pursuing the use of reclaimed sweater yarn. This constituted the question “if this is possible, to what extent?” I tested four sweater sleeves, still knit, but separated from the sweater body- 100% wool; 75% wool and 25% acrylic; 40% angora 20% merino wool and 40% acrylic; lastly 20% wool and 80% acrylic (side bar diagram instead?). I determined that, while the content of yarn does have an impact on how many repetitions are necessary for binding, the volume/thickness of the yarn can compensate for the reduced wool content. Almost all sweaters, including those with portions of slippery polyester, or 100% acrylic, could be used to successfully produce a felted sheet.

Intuitive leaps are guided by the “If..?” and “What if...?” mode of inquiry. It is a progression of initial exploration of potential followed by defining and extending the inquiry. These are also exercises conducted in Materials Science, where the determination of a system’s characteristics makes connection with other systems (tools, materials, methods) possible.

“Surprise is a way of telling yourself that something you know can be other than you assumed.”
Richard Sennett, 2008, p. 209

Intuitive leaps progressed from questions of “what if” to contemplations of impact, material selection, retention of material identity, and re-valuing waste through new context and form. Just as the fibers of the sweater yarn became entangled and embedded in one another, so did the felted sheets begin to embody the phases of understanding the emerging material. The partnership of reflection through unmaking and the body-material negotiation of making were beginning to become an inseparable whole, just as the fibers of a felted sheet grow closer and closer with each puncture of the barbed needle. Mäkelä described this as knowing through making, where the object or outcome of the making serves as an embodiment of the knowledge gained (2007).

Fig. 37- (Right) Mixture of 100% wool (blue yarn) and 80% acrylic with 20% wool yarn (grey). Both of the yarns were of a similar, medium weight gauge and felted very similarly. The wool was more quickly felted, but the acrylic would have only needed one or two more passes to have the same felted strength as the wool components.



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2.4.4 Collaborations with Material- Gravity and Risk

The gravity that Sennett includes as part of intuitive thinking lay in addressing material problems. A new solution for one problem does not automatically solve another. I may have answered the question of using reclaimed sweater yarn to produce felt, but that opened up a whole new arena of material negotiation.

“Through reflection-in-action, practitioners can evaluate their encounters during the process of making and alter their actions accordingly” (Aktaş & Mäkelä, 2019, p. 60).

In felting with a machine and yarn, the behavior of the yarn is both predictable and unpredictable. Patterns may appear similarly as placed, but the strength of the resulting sheet is entirely dependent on how the yarn shifted, relented, or resisted the guiding motion of the rollers. If the yarn resisted the pull of the rollers, and I did not press and guide the body of the yarn through them, there would be gaps, lengths of yarn pulled out where the sheet continued. These vacant spaces then needed patching, and decisions about how to match or distribute colors, arrangements, and portions of yarn then determined the sheet's appearance after patching. “by its nature, wool advances its own entanglements whereas the maker aims to create her/his own entanglements. The way how these two movements contribute to the emergence of the new artefact can thus be understood as a negotiation as the movements of the material and the maker come to an agreement to create the final form” (Aktaş & Mäkelä, 2019, p. 62).

David Pye discusses something akin to gravity in the two different sides of workmanship, the workmanship of certainty and the workmanship of risk. The workmanship of certainty can be categorized as workmanship that utilizes methods with predetermined outcomes. Automatic machinery and production would be considered workmanship of certainty. Workmanship of risk, contrarily, is work that has risk inherent (2015).

The felting machine in the TARP lab in Material Matters is a production tool and has many attributes of workmanship of certainty. It is very simple to run layers through and, with repetition, return a fully felted and integrated whole. One question in the progression of this practice development is at what point does making action shift from play to practice? In other words, when does material exploration (low perceived risk) transition to practice- higher actual outcome risk?

Fig. 38- This piece is felted from a 100% acrylic blanket (white pieces) that was crocheted and had been felted from many washes. The blanket was cut into crocheted sections and were felted together with the grey, 100% acrylic yarn.

The crocheted pieces were too bulky to easily pass through the machine and the needles struggled to puncture the bulk. Most of the blanket pieces fell off. The result, however, is a piece of material in the middle of refinement, or one that has come from risk and is the result of failure.



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CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

2.4.5 Reflections on Practice

The transition between exploration and practice were reflected upon in two different venues. The first being a sharing session in the TARP lab with other designers who had concurrently been exploring the use of felt in their practice. The second being through the act of felting itself.

The designers involved in the felting share were generous enough to respond to a discussion around risk, the nature of risk in practice, and the approach to refining material play when using the felting machine to move exploration to research and play to practice. I have included a small excerpt from the discussion between myself and H  l  ne Day Fraser.

D: The craftsmanship of risk is like hand carving. There is the chance that you're going to dig too deep and there's going to be an amount of failure. There's a risk inherent in every step of the process. The felting loom is this interesting intersection of risk and certainty.

If you were to hand felt a whole meter length sheet, you know that it's either going to turn out correctly all the way through or there are going to be points of failure and it's because your attention drifted. With acrylic fibers it's not going to wet felt, so I'd have to do needle felting by hand. That's insane. But with this loom, we have a level of certainty that if we stick it through, something's going to happen and that we don't need to be as specific. But how do we take on more risk? How do we refine technique? How do we approach this as a research tool and develop practice? So that's the question- is where is refinement or the taking on of risk? How are we looking at this as a practice?

H: For me, that goes back to when people were just shoving things into the loom. I'm curious how that collectively shifts over time, because there's this sort of immediate joy of putting something through and noticing "It's going together!" This thing of just pushing it all through and realizing you can create a cloth. But that to me is not the craft.

So then maybe it's identifying what the combination is. If it's already risk apparent, you refine; if it is totally refined then you have to insert risk.

Fig. 39- Partially felted wool sheet, back side felted with front side left unfelted to leave the wool textured in the same fashion that it was laid out.

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2.4.6. A Key Actions of Practice- Social Making Practice

The actions of practice discussed in section 2 are summarized here in Sections 2.4.6 A&B. These actions are described as discerned through both the social making and emergent material practices.

Heuristic making, making as reflection, disassembly as learning, collaborative making, and reflective writing were used in the formulation of the characteristics and actions of social making practice.

Action of Practice	Description and function
Guidance vs Dictation	Facilitation of others' making and improvisational journey. Minimum intervention- guiding the provocation, not dictating the outcome
Discussion as Reflection	Spouse, Benjamin, played a critical role in navigating complex ideas of resilience, habit, practice. Conversations with others provided insight into material valuation, craft as culture, craft as practice.
Share and Critique	Posing questions to designers and makers using the same means of production and research to aid in the definition of practice with a piece of industrial equipment. Establishment that practice is in taking on risk and refining, making without risk is not practice.
Problem Solving	Frequently throughout making and exploration there are unexpected outcomes, or even issues/disinclinations of materials or system to behave in a particular way. Iterating, documenting, and innovation are all aspects of problem solving that are essential to the divination of an individual practice. Collaboration, discussion, and critique are methods of extending the problem solving outward.

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

2.4.6. B Key Actions of Practice- Emergent Material Practice

Improvisation, reaction, iteration, documentation and reflective writing were used in the formulation of the characteristics and actions of an emergent material practice.

Action of Practice	Description and function
Improvisation	Reaction to nature of material, partnership with material in making (preferred) vs subjugation of material, outcome is determined through process of making, relies on leaps of intuition (Sennett, 2008)
Minimum intervention	Minimum intervention with materials and with others- persuasion of outcome and behavior. Characterized by role of facilitation or limited material modification
Documentation	Mode of processing and embedding practice as muscle memory/ second nature. Allows for tracing of process, method, and correlate results with choices or behavior while making
Reflection	Reflective writing provided the foundation for making as learning, improvisation and making, making as observation, etc. This was an irreplaceable aspect of the research
Material Awareness	Developing skills of identification, valuation, and ideation in regards to the identity and potential of materials (Sennett, 2008)

2.5 Het Hof Van Cartesius- A Community of Circularity



Fig. 40-(Top) Skyscraper by Studio KCA, sculpture is made from 5 tons of plastic waste that was polluting waters near Hawaii. The sculpture was on loan to the city of Utrecht until September 2019.

Fig. 41- (Bottom Left) Restaurant “Roost Aan De Singel” is a cafe that appears to have been built from recycled construction materials.

(Bottom Right) Seating area built of pallets outside of film house and recording studio.



CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

The opportunity to extend my experience outside of North America was a key inflection point in the trajectory of my personal practice. I was exposed to a variety of studio practices, dissemination tactics, and methods of community development through material practice. One community in particular provided a precedent for community scale practices of resilience. In this document I will only be detailing the community Het Hof Van Cartesius, though there were many other observations, reflections, and experiences that were personally valuable.

The City of Utrecht has spent a great deal of effort in the last few years focusing on the development of a new center of the city. One of the neighborhoods in development is home to a half block development titled "Het Hof Van Cartesius." This land was proposed to the city of Utrecht as a community built entirely from recycled and reused construction materials. Charlotte and Bianca Ernst are the architect and community organizer, respectively. I was able to visit and speak with Bianca and Mark Ernst, who is also involved more directly with the tenants, regarding the origins and practices of the community.

The development was submitted as a bid to the city, funded by their company, Buurman, which works to coordinate the integration of used construction material in new construction projects. The process of constructing buildings entirely from used materials begins with Charlotte developing a plan for a structure. The plan must be adjustable according to the material available, not the material being adjusted according to the plan (contrary to most design and construction.) She is able to improvise at all stages of the planning and building because she has already developed her knowledge and skill in design, zoning laws, and has applied them to a guiding principle of utilizing what's available. This combination has resulted in a multitude of innovations for use - many of which are detailed in Fig. 42-46.



Fig. 42- Decorative details made from panels, furniture pieces, scrap wood, plastic packaging, marbles, and others, on exterior of artist and business fronts inside Het Hof Van Cartesius.



Fig. 43- Station facing corner of Het Hof Van Catesius. The first introduction to the community includes mixed source paneling and rusted, stainless steel remnants from industrial water jet cutting.

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Fig. 44- (Opposite) Uses of used construction and consumer materials in building, decoration, and functional applications

Fig. 45-Clockwise: (Left) Bottle cap storage made from recycled steel. (Right) Pallets fitted as wall cladding and indoor garden shelving. (Bottom) Bar counter built for festival in Amsterdam re-purposed as kitchen counter.

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Maintenance of this community is not, however, left to the founders/developers. Community members- both business and residential, must agree to contribute to the care of the community and property as part of their residence. In this community goods, materials, and possessions are cycled and used as many times as possible before disposal.

Het Hof Van Cartesius is an example of top-down and bottom-up social innovation discussed by both Manzini, regarding social innovation (2015) and Zolli & Healy, regarding lasting resilient change (2013). The City of Utrecht has prioritized this neighborhood as a local hub, with several other circularity oriented businesses, in a former business park. This support was extended to a bottom-up initiative by a family, the Ernst siblings, that had established a business and personal practice of circularity and were seeking to extend that practice toward building a community. Without the strength of both ends of the hourglass described by Zolli and Manzini, the momentum now heralded and initiated in other parts of Utrecht would not have taken hold.



Fig. 46- This new workshop and material repository building was under construction at the time of my visit. Materials were sourced from a development site in The Hague. The laminate wood had been cut incorrectly for the construction plans.

3 Discussion: The Link Between Resilience and Practice

In the actions of practice I was able to learn that making is a low-stakes learning space, wherein a burgeoning maker can explore new ideas, practice new skills, and connect with others in a community in the process of learning and practicing.

I have presented making as a mode of connecting the actions of practice that are corresponding to characteristics of resilience. The connections of a material practice and resilience are detailed in Appendix B. In this discussion I present the synthesis of studying resilience and material practice through a series of exercises compiled in a workbook. I also describe resilient design and the importance of a Local designer. Manzini, in “Design, When Everybody Designs,” states some of the outcomes of adopting resilient practices lead to strengthened communities in distributed networks (2015).

The workbook builds on Richard Sennett’s discourse of material awareness - meaning a comprehension of what is around participants and an excitement for potential making (2008) - as a means of developing a higher appreciation and utilization of surrounding objects as resources. This awareness facilitates the instigation of improvisation, re-purposing, and social making as new habits and behaviors. Personal value and satisfaction that is gained through skill, knowledge, and the appropriation of goods serve as building blocks of resilient individuals that can initiate the growth of resilient communities by example and invitation.

“The abductive leap allows the researcher to work with the designer’s ability to tackle situations from multiple perspectives. In seeing connections across and between disparate sources of content it becomes possible for new ways of seeing the research problem to be disclosed,” (Grocott, 2018).

CHARACTERIZING RESILIENCE AND PRACTICE THROUGH MAKING

3.1 Obstacles of Resilience

Through the duration of my thesis research I was working through two inter-connected spaces- the development of practice, and the development of resilience. I have already touched upon the development of practice in the previous section (and additional sections in Appendix A).

Resilience can be constructed of obstacles and strengths equivalently. To each characterizing strength that constitutes resilience, there is an obstacle that either serves as challenge to our fortitude, or a subversion or reformatting of the obstacle (see Fig 47) that reaffirms and further expands our horizons. Zolli & Healy describe this in “Resilience: How Things Bounce Back” as expanding our range of alternatives (2015).

Discomfort

Obstacle	Subversion
<ul style="list-style-type: none">-Potential of failure-Lack of knowledge or skill-No tools or preferred material-Unsure of outcome-Need specific conditions to succeed	<ul style="list-style-type: none">+”Failure” can be used to inform the next inquiry, refinement not termination+Learn negotiation and adaptation+Drives or encourages change

Scarcity

<ul style="list-style-type: none">-Limited resources-Saving for future use-Fear of waste-No access to desired materials	<ul style="list-style-type: none">+Limits encourage innovation+Material is valued as resource now, not hidden against uncertainty+Waste is reduced or redirected to become resource+Design for the material, not material for the design
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Indeterminance

<ul style="list-style-type: none">-Uncertainty-Limited understanding of objects, limited or singular purpose/use-Preference toward habit/familiarity	<ul style="list-style-type: none">+Freedom of possibility+View objects as systems of potential or resource+Embracing end results as knowledge- perceived success or failure+Making leads the process, not the intended outcome
--	---

Fig. 47 -Obstacles of resilience and subversions

MATERIALS OF RESILIENCE

3.2 Characterizing Resilience Through Habit

Resilience in an individual can be described through relationships, habits, priorities, abilities, and unique traits. Fig. 48 illustrates my efforts at mapping what constitutes an individual's personal resilience. Through making and reflection, I have observed that an individual's potential for growth and active contribution to others are traditionally recognized characteristics of success. Zolli & Healy describe these through the fundamentals of hardiness- "1) the belief that one can find a meaningful purpose in life, 2) the belief that one can influence one's own surroundings and the outcome of events, and 3) the belief that positive and negative experiences will lead to learning and growth," (2015, p. 127). Growth can be described as the ability a person has to learn new things and progress economically, academically, socially, or emotionally. Active growth- or an individual's proclivity to learn and change- has a more significant impact on resilience than potential alone. Contributions to others can be described as how a person adds to the collective whole, through expertise, their resources, or their knowledge. How an individual navigates and addresses obstacles is also key to resilience (See Fig 47). Resilience is increased through the utilization of obstacles as opportunities to learn, change, and adapt (Zolli & Healy, 2015). Lastly, the mode in which an individual builds relationships with others is indicative of resilience. Strong and weak ties with others, i.e. close friends and acquaintances, are equivalently important to building resilience outside of personal resources (Zolli & Healy, 2015; Duhigg, 2014).

"Yet resilience-thinking does not simply call us into a defensive crouch against uncertainty and risk. Instead, by encouraging adaptation, agility, cooperation, connectivity, and diversity, resilience-thinking can bring us to a different way of being in the world, and to a deeper engagement with it," (Zolli & Healy, 2015, p. 16).

Each aspect of individual resilience consists of established habits. How we spend our time, interact with others, and address challenge or change are behaviors that we have built into our cognitive perception and processing of situations (Merrill, 2016). Habits are how we ingrain behaviors that aid us in being able to adapt to changed circumstances, and habits are what ground us in our core purpose (Zolli & Healy, 2013; Duhigg, 2014).

DISCUSSION: THE LINK BETWEEN RESILIENCE AND PRACTICE

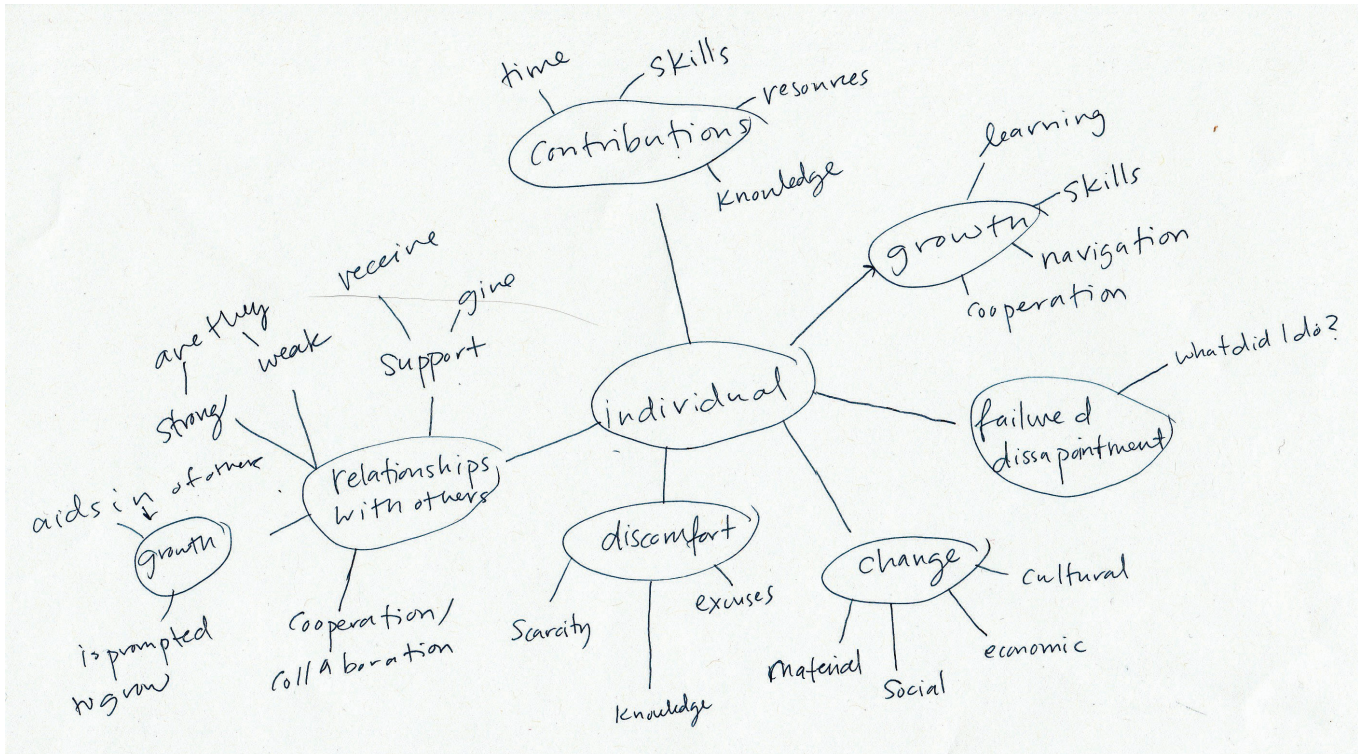


Fig 48- Areas where an individual can either exhibit or develop resilience. Conversely, weaknesses in these areas can result in the reduction of resilience

Charles Duhigg describes habits as three main parts: cue, routine, and reward in his book, "The Power of Habit". A cue initiates a routine in our brains. The routine is the action and behavior, mental, physical, or emotional. The reward is the confirmation that the routine is positive (2014). Similarly, Zolli & Healy (2014) and Donella Meadows ("Thinking in Systems", 2015) would describe the Cue and Reward components of habit as feedback loops- where the results or consequences of an action or system provide feedback that either confirms the system or action as positive or negative.

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Feedback loops exist in all levels of organization and system organization. Both external and internal stimuli provide the reward or feedback that reinforces or removes the validation of action or system. In a community, the resilience of an individual is not isolated from the resilience of the community. Duhigg described communities as collections of habits existing in thousands of people (2014). Fig 49 gives an example of individual resilience mappings as they can connect outward into a larger, community network. This mapping was developed through a series of reflective writings and mapping. Individuals who have many resources can contribute them in support of those with fewer resources, or someone with unique skills that can strengthen someone else's positive habits or growth. This is a very simplified representation, but a resilient network is one of material, social, and emotional connection, collaboration, and sharing (Zolli & Healy, 2014).

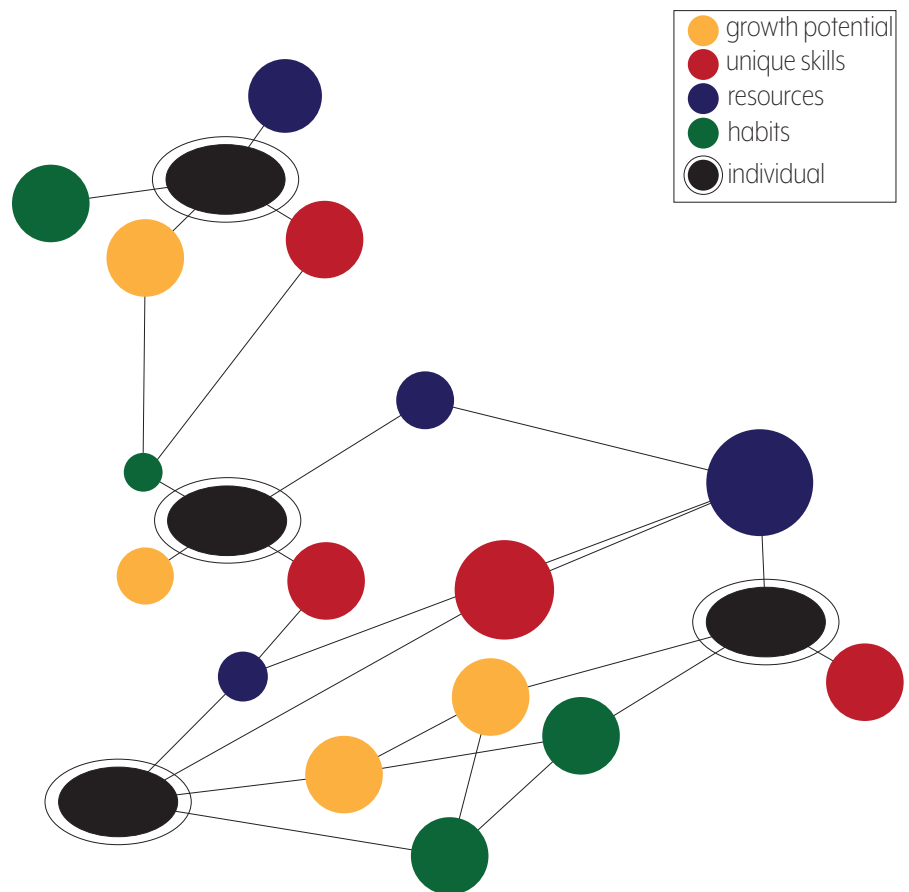


Fig. 49 -Connection of individual habits and characteristics into a network

DISCUSSION: THE LINK BETWEEN RESILIENCE AND PRACTICE

3.3 The Development of a Practice for Resilience

The development of a resilient material practice requires the budding practitioner to overcome the same obstacles as one must to become more resilient. To begin, the neophyte to making or to a resilient practice must first develop and identify conditions for success. They may begin by asking questions: “How do I define resilience? How resilient or self sufficient am I? ” or “How would I rate my current making ability?” or “What do I know about this material/craft?” Establishing a baseline through self study invites the practitioner to engage in reflection regularly to determine progress.

My reflections on practice - which were focused on new material developments in shifting waste into resource, natural and local fibers, and collaboration with others through prompts and exercises - provided the foundation upon which I could construct a series of exercises organized around the explicit development of material practice for resilience. This material manifested in a designed outcome, a workbook/mini course oriented around the development of improvisational making, reflection on the composition and material potential of objects, and embedding these ways of making and knowing into personal and community practices. See Appendix C for workbook material.

There are three fundamental objectives of the workbook. First: Establishing a habit of developing making skills. The course covers the span of two weeks, with participants invited to introduce the habit of making and skill development into their daily schedule- discussing the role of cues, routines, and rewards in the establishment of habits.

Second: The introduction of a fundamental shift in the participant's value system with regard to the objects in their life. This involves a sequence of documenting, cataloging, and categorizing to initiate awareness of what exists around them. The sequence then leads into the development of a material consciousness or awareness. Sennett introduces this as the craftsperson's efforts to do quality work are dependent on curiosity about the material. (2008). This curiosity is translated into a sequence of studying objects for form and material. They then progress to ideation and making, focusing on documentation of their experience as a mode of processing and identifying obstacles and victories. This process invites the new maker to think more critically about the resources of made objects, the components, the strengths, as well as to consider all objects as having potential.

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Third: The role of social making, or community in establishing a habit. There are two iterations of this course, one that is oriented around workshops and one that includes social making as a component of the individual practice. In both of these iterations the role of community is introduced. Obstacles of indeterminacy, scarcity, and discomfort are touched upon while learning and teaching making skills with others, and are addressed head on in the act of improvisational making. Improvisational making exercises are based on theater improvisation and hinge on the same principles of acceptance, both of others and of self, and push the participant out of the comfort zone of planning exact steps and invite responsive making that occurs when others have equal contribution power to direct the outcome.

These three fundamental objectives prepare an individual to invite others to develop resilient making practices. As the new practitioner exercises skills and expresses excitement for the practice, they will naturally want to invite others to develop the same attributes and skills. New making practitioners and their acts of resilience serve as examples to their communities. Example and connection to community have the potential to invite others to make and develop a personal material practice. The practical roots of improvisation make priority of each maker, object, and material being addressed. The new thoughts, approaches, methods, and outcomes that come naturally from each exploration build a foundation of diverse making and knowledge generation.

Zolli & Healy emphasize the importance of diversity in resilience. They detail organizational, cognitive, resource, and economic diversity (2014). In the example of the workbook, the importance of a reliance on informal networks, built on deep trust, sustains efforts to build resilience that becomes embedded in daily life and relationships. It is in these spaces, according to Zolli & Healy, resilience can flourish. The necessity for a variety of ideas and ways of doing and knowing can be likened to the biodiversity of a forest- systems with a singular or largely dominant species are subject to devastation if the health of the dominant species is compromised. So it is with communities, organizations, and systems, a single, dominant way of doing leaves the system vulnerable to collapse. “The complexity, concentration, and homogeneity of a system can amplify its fragility; the right kinds of simplicity, localism, and diversity can amplify its resilience,” (Zolli & Healy, 2014, p. 59).

4 What Do We Know and What Should We Do? (Conclusions and Recommendations)

In this thesis research three lines of inquiry have occurred:

What is practice? Here, a definition of practice was formed by the development of a material practice and subsequent reflection, as well as being guided and refined by literature- namely the characterizations presented by Richard Sennett and David Pye.

“The goal then need not be to produce evidence-based research or a fully theorized position on design praxis, but to present appropriate strategies for designers interested in interrogating the oftentimes tacit knowing of creative practice.” - Grocott, on how understanding designerly ways of knowing can contribute to the scholarship of design (2011, p. 4).

What is resilience? A definition of resilience was formed through empathetic reflection and making, discussions with makers, friends, and peers, as well as in literature- writings by Charles Duhigg, Ezio Manzini, and, in particular, Andrew Zolli and Ann Marie Healy.

What role does material practice have in developing resilience? This space was investigated through material practices focusing on three main areas- improvisational making and reflection, facilitation of practice development in others, reflection and mapping exercises, and connecting the attributes of practice and corresponding attributes of resilience as described in literature and from personal practice (See Appendix B).

Lisa Grocott described the importance of design research generating results that are accessible to others through evolutionary discourse. “Multi-modal enquiry can help the audience to potentially see things from a new perspective by advancing a new conceptualisation of the content” (2011, p. 20).

How do these investigations address the problem initially introduced? Our world is changing and we may well be unable to adapt. We have a dependence on external sources- stores, internet services, delivery, online ordering, all for our material well being. We look up the answer to every question on the internet, if it can't be found in a few seconds, it must not be worth knowing. We want everything now and billions of dollars are spent in businesses addressing that demand. Goods come from across the ocean, while local suppliers and producers struggle to be competitive with the rock bottom pricing.

This work is therefore presented as transitional. There is much more work that needs to be done than individuals becoming more resilient and more conscientious about the function, quality, and additional life-cycles available in their possessions. These practices have the potential to serve as keystone habits and building the foundation for local hubs, or clusters, or making, re-purposing, and upcycling.

4.1 Design For Resilience- Building Upon Individual Practice

“In their purest expression, resilient systems may have no baseline to return to- they may reconfigure themselves continuously and fluidly to adapt to ever-changing circumstances, while continuing to fulfill their purpose.” (Zolli & Healy, 2014, p. 13)

“In aligning designerly ways of knowing with criteria for research the design community does not need to emulate the kinds of knowing generated by other disciplines, but instead to be able to understand how a practitioner’s knowing might complement the perspectives an interdisciplinary community of researchers’ bring to the scholarship of design.” (Grocott, 2011, p. 4).

Ezio Manzini presents the next phase of resilience through social innovations, namely in the establishment of social economy. A social economy is an answer to the issues with a growth economy, or an economy that is based on growth as a measure of economic health. Social economies, conversely, are structured around an economic pluriverse (defined by Estava and Escobar) where pluriverses, or clusters, are organized in distributed networks- which can scale from community to global. These clusters would, in essence, be built through the foundation of meeting individual and community needs as defined by the resilience networks shown in Fig. 49.

Manzini further argued “If, technically, resilience means diversity, redundancy, and continuous experimentation, it also means that the corresponding society must be a diversified, creative one. Taking seriously the meaning of resilience, this compelling and deeply human image of society becomes much more than just a wish. It indicates the direction in which, very practically, we need to go if our society is to have any hope of lasting. In short: in a resilient society, cultural diversity and creativity must flourish. Indeed, cultural diversity and creativity must be an integral part of any scenarios of resilient societies.” (Manzini, 2015, p. 22). This diversity, however, is not exclusive to the social and cultural realms. Zolli & Healy cautioned against centralization of production and economic growth, inviting clusters of resources, tools, ideas, and especially diversity of talent (2014, p. 12). Some regions are better suited for agriculture, others for education or fabrication, but that does not mean that the ideas, practices, production, and goods should be separated by region. A healthy system has a degree of redundancy and overlap (Zolli & Healy, 2014).

WHAT DO WE KNOW AND WHAT SHOULD WE DO?

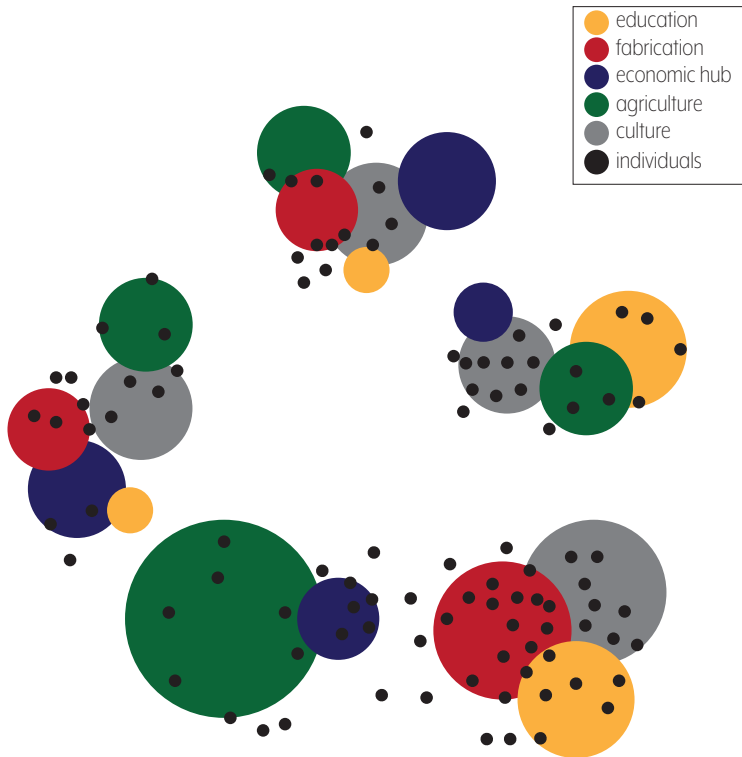


Fig. 50 -Connection of individual habits and characteristics into a network

Clusters, as illustrated in Fig. 50, would consist of individuals and corresponding personal resiliencies, the communities that grow out of connecting individuals, and varying degrees of production- for example, agriculture or fabrication, the positioning of education (formal and informal), the economic positioning production (potentially through hubs), and the culture that connects individuals to one another and varying aspects of the cluster.

These clusters, while numerous, would increase the transparency of the overall system. Unlike large, top-down organizations, like centralized banks, where information does not necessarily travel with equity through the system so that all invested and affected parties are informed, these smaller points of local production, fabrication, and cross cluster economic transactions, are organized so that there can actually be a high level of accountability for production and consumption behaviors. Such practices can be seen in small scale agriculture and Fibershed practices (Burgess, 2019).

In Zolli & Healy's words, "The complexity, concentration, and homogeneity of a system can amplify its fragility; the right kinds of simplicity, localism, and diversity can amplify its resilience," (2014, p. 59).

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Cagla Dogan similarly makes the case for integrated design that utilizes both local and regional production resources. This type of design practice explicitly centers upon local tastes, enterprises, encourages post-use and has the potential to lead to new individual-material relationships. These focuses shift away from the globally standardized goods and makes way for local job opportunities and community development, and forces a shift in consumer perception of the appearance, quality, function, cost, and life-cycle of goods (n.d). Reconfiguration of our relationship to goods and materials leans heavily towards sociality and commerce that sustains an economic pluriverse.

Manzini provides two cautions that connect intimately with the provocation of my thesis. The first being that distributed systems cannot be built without consideration for the social and cultural fabric that they will be stitched in and out of (2015).

Centralized systems, the global systemic norm, can be built without such considerations, and it's this disconnect that has caused such traumatic conflict between growth and culture (Zolli & Healy, 2014), growth and indigeneity, growth and ecological health, growth and safety. Boehnert and Onafuwa have described these impacts as the "isms" of symbolic violence (2016).

WHAT DO WE KNOW AND WHAT SHOULD WE DO?

4.2 Concluding Thoughts- The Imperative of the Local Designer vs the Design Expert

Manzini's second caution comes in the real investment of those who intend to initiate the establishment of these localized systems. "...no distributed system can be implemented without social innovation: distributed solutions (such as small scale production and use of renewable resources, localized food networks, micro-factories) can only work if groups of dedicated people decide to adopt them and commit themselves to their implementation," (2015, p. 17). In essence, a system that is designed, issued, and mandated from the outside of its function and life-cycle does not have the capacity to endure. There is a crucial need for those who are involved and invested to initiate these systems. Herein is the argument for the Local designer.

In these distributed, or clustered, systems, the designer is positioned as an equal stakeholder in the impacts and consequences of design, production, and life-cycle. The designer of the emergency shelter is now accountable for the material acquisition- for it now occurs in their backyard. The designer is also accountable for the social and cultural viability of the shelter, for they, and their neighbors, have to live in them. The designer shares accountability for the use and life cycle of the shelter with their community, for once they have finished use of them, they cannot send it elsewhere to be disposed of.

How different would our decisions be if the majority of our goods, services, and behaviors, had a consequence that was centralized in our own neighborhood and community. How would we prepare if we truly knew that the local agriculture would suffer with the changing temperatures in the summer, with droughts forecasted and forest fires definite?

Scarcity of material would push designers, craftspeople, and community members alike to invest in discovering methods of turning waste goods and materials into resources. Innovation would come as parties of varying backgrounds, knowledge, and individual material and resilient practices would collaborate to address issues present and inescapable to all.

References

- Aktaş, B. M., & Mäkelä, M. (2019). Negotiation between the Maker and Material: Observations on Material Interactions in Felting Studio. *International Journal of Design*, 13(2), 55–67. Retrieved from www.ijdesign.org
- Boehnert, J., & Onafuwa, D. (2016). Design as Symbolic Violence : Reproducing the 'isms' + A Framework for Allies. *Intersectional Perspectives on Design, Politics and Power* School of Arts and Communication, Malmö University, November, 1–14.
- Brown, B., Inquiry, C., Autumn, T., & Brown, B. (2001). Thing theory. *Critical Inquiry*, 28(1), 1–16. <https://doi.org/10.4018/978-1-5225-9863-3.ch038>
- Burgess, R., White, C., & Green, P. (2019). *Fibershed: growing a movement of farmers, fashion activists, and makers for a new textile economy*. Chelsea Green Publishing.
- Critical Reflection. (2019, March 4). Retrieved from <https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/planning-courses-and-assignments/course-design/critical-reflection>
- Daly, H. (2008, April 24). Herman Daly: Towards A Steady-State Economy. Retrieved from <http://www.theoil drum.com/node/3941>
- Damasio, A. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York: Harcourt.
- Dogan, C., Student, P. D., Walker, S., & Walker, S. (n.d.). Design in Context Product design through local initiatives Cagla Dogan Design in Context Product design through local initiatives.
- Duhigg, C. (2014). *The Power of Habit: Why We do What We do in Life and Business*. Anchor Canada.
- Esteva, G., & Escobar, A. (2017). Post-Development @ 25: on 'being stuck' and moving forward, sideways, backward and otherwise. *Third World Quarterly*, 38(12), 2559–2572. <https://doi.org/10.1080/01436597.2017.1334545>

REFERENCES

- Gallese, V. (2001). The 'Shared Manifold' hypothesis: From mirror neurons to empathy. *Journal of Consciousness Studies*, 8(5-7), 33-50.
- Glanville, R. (2015). The Sometimes Uncomfortable Marriages of Design and Research. In *The Routledge Companion to Design Research* (pp. 9-22). Routledge.
- Grocott, L. (2011). Designerly Ways of Researching. *Studies in Material Thinking*, 6. <http://www.materialthinking.org/papers/60>
<https://doi.org/10.1007/s13280-013-0483-6>
- Humes, E. (2013). *Garbology: our dirty love affair with trash*. Avery.
- Huotilainen, M., Rankanen, M., Groth, C., Seitamaa-Hakkarainen, P., & Mäkelä, M. (2018). Why our brains love arts and crafts. *Form Akademisk - Forskningstidsskrift for Design Og Designdidaktikk*, 11(2). doi:10.7577/formakademisk.1908
- India Block | 31 July 2018 (2018, August 3). Shigeru Ban builds temporary shelters from paper for Japan flooding victims. Retrieved from <https://www.dezeen.com/2018/07/31/shigeru-ban-temporary-shelters-paper-japan-flooding-architecture/>
- Johnson, M. (2007). *The meaning of the body*. Chicago: Chicago University Press.
- Kandasamy, S., Anand, S., Wahi, G., Wells, K., Pringle, K., Weatherall, L., . . . Rae, K. (2016). Re-stitching and strengthening community: Three global examples of how doll-making translates into well-being in Indigenous cultures. *Journal of Applied Arts & Health*, 7(1), 55-75. doi:10.1386/jaah.7.1.55_1
- Keikelame, M. J. (2018). 'The Tortoise under the couch': an African woman's reflections on negotiating insider- outsider positionalities and issues of serendipity on conducting a qualitative research project in Cape Town, South Africa. *International Journal of Social Research Methodology*, 21(2), 219-230. <https://doi.org/10.1080/13645579.2017.1357910>

MATERIALS OF RESILIENCE

Lbowdish. (2017, May 18). Circularity vs. Sustainability. Retrieved from <https://www.uschamberfoundation.org/circular-economy-toolbox/about-circularity/circularity-vs-sustainability>

Mäkelä, M., & Nimkulrat, N. (2018). Documentation as a practice-led research tool for reflection on experiential knowledge. *FormAkademisk*, 11(2), 1–17. <https://doi.org/10.7577/formakademisk.1818>

Mäkelä, M. (2007). Knowing Through Making: The Role of the Artefact in Practice-led Research. *Knowledge, Technology & Policy*, 20(3), 157–163. <https://doi.org/10.1007/s12130-007-9028-2>

Manzini, E. (2015). *Design, when everybody designs : an introduction to design for social innovation*. The MIT Press.

Marcus Fairs | 29 April 2017 (2017, May 1). Ten thousand IKEA refugee shelters left unused over fire fears, United Nations admits. Retrieved from <https://www.dezeen.com/2017/04/29/united-nations-admits-10000-ikea-better-shelter-refugees-mothballed-fire-fears/>

Meadows, D. H., & Wright, D. (2015). *Thinking in systems: a primer*. White River Junction, VT: Chelsea Green Publishing.

Merrill, N., Waters, T. E. A., & Fivush, R. (2016). Connecting the self to traumatic and positive events: links to identity and well-being. *Memory*, 24(10), 1321–1328. <https://doi.org/10.1080/09658211.2015.1104358>

Minter, A. (2020). *Secondhand: travels in the new global garage sale*. Bloomsbury.

Nimkulrat, N. (2012). Hands-on intellect: Integrating craft practice into design research. *International Journal of Design*, 6(3), 1–14.

Ortiz, J. (2012). CRAFT AND RESILIENCE Northern Ontario's Emerging Cultural Identity. *Cahiers Metiers d'Art / Craft Journal*, 5(2), 23. <https://login.ezproxy.net.ucf.edu/login?auth=shibb&url=http://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=79949725&site=eds-live&scope=site>

REFERENCES

Pye, D. (2015). *The Nature and Art of Workmanship*. Bloomsbury Academic.

Schubbach, A. (2017). The Practice of Practice-Led Iconic Research. *Visible Language*, 51/52(3-1), 34.

Sennett, R. (2008). *The Craftsman*. Yale University Press.

Simms, A., & Johnson, V. (2010). Growth isn't possible: why we need a new economic direction. Schumacher College, 2-3. <http://www.neweconomics.org/publications/entry/growth-isnt-possible>

Sullivan, G. (2009). Making space: The purpose and place of practice-led research. In *Practice-led Research, Research-led Practice in the Creative Arts*.

Toussaint, L. & Meugnot, A. (2013). Short-term limb immobilization affects cognitive motor processes. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 39(2), 623-632.

Zolli, A., & Healy, A. M. (2013). *Resilience: why things bounce back*. Simon & Schuster Paperbacks.

Appendix A

Collaborative Guided Making

“Sociable expertise addresses other people in their unfolding prospects just as the artisan explores material change; one’s skill of repair is exercised as a mentor; one’s guiding standards are transparent, that is, comprehensible to nonexperts,” (Sennett, 2008).

Just as Sennett wrote, I too wanted to exercise the knowledge I had gained in observation and reflection through heuristic explorations (see section 2.2). I approached the endeavor as a collaborating mentor to a friend, visiting Vancouver from the US. Our conversation, and my responses to my companion’s thoughts, drawings, and conclusions, resulted in a sequence of prompts. These prompts were given as a routine of observation directed towards an object.

My collaborator, the friend to whom I was giving prompts, is a close friend since high school who had come to visit and was unfamiliar with most areas of the city. She was an ideal contributor in refining the guided thinking and making process as she did not have a pre-established relationship with materials, objects, or people in the city.

The following numbered sequence provides detail of the prompts as they were extended to my collaborator. Notes are included at points where my collaborator’s response, questions, or pauses resulted in a modification to my facilitation. Some notes also include the intention or a comment on the outcome of the prompt.

Guided Making Prompts:

1) Choose something to look at.

2) Draw what you see.

- My friend chose to study a bicycle locked up near the bench she had chosen to sit on. She felt comfortable studying an object that she was familiar with and did not hesitate to try and include visual information she felt was important.

3) Identify the different shapes that your object is made of. Are there circles? Tubes, squares, or other non-geometric forms?

- This serves as an instigation of identifying the object as an abstract series of shapes. Instead of being a complex system- it could be considered in one or two easily identifiable shapes to start.

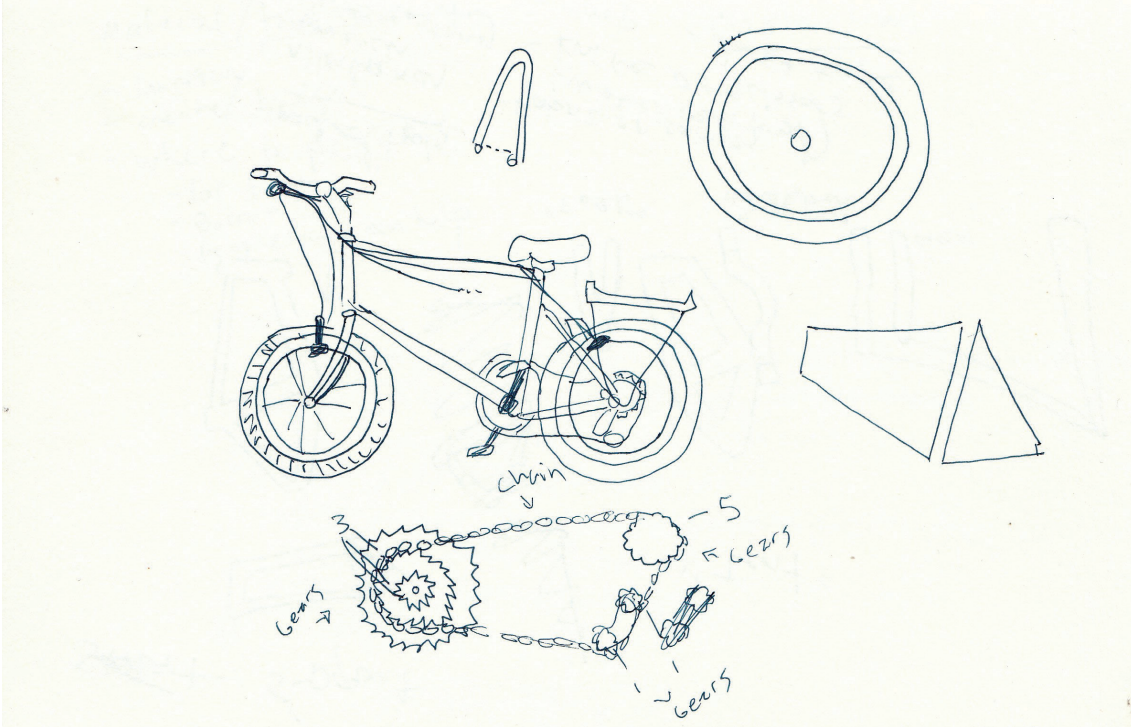


Fig A-1 - Initial drawing study of a bike and it's component shapes- located on Granville Island

4) Choose a shape. What do you think you could make using that shape?

- Limiting the ideation to one shape selected from a complex object- the bicycle- allowed for my collaborator to simplify the ideation process to a series of building blocks.

5) If you were to start making this now, what would you need?

- Tools
- Additional materials

6) Write out your steps

- Material and tool sourcing
- Deconstruction
- Access to needed materials, space, tools
- Can you borrow what you need? Can you make an approximation?

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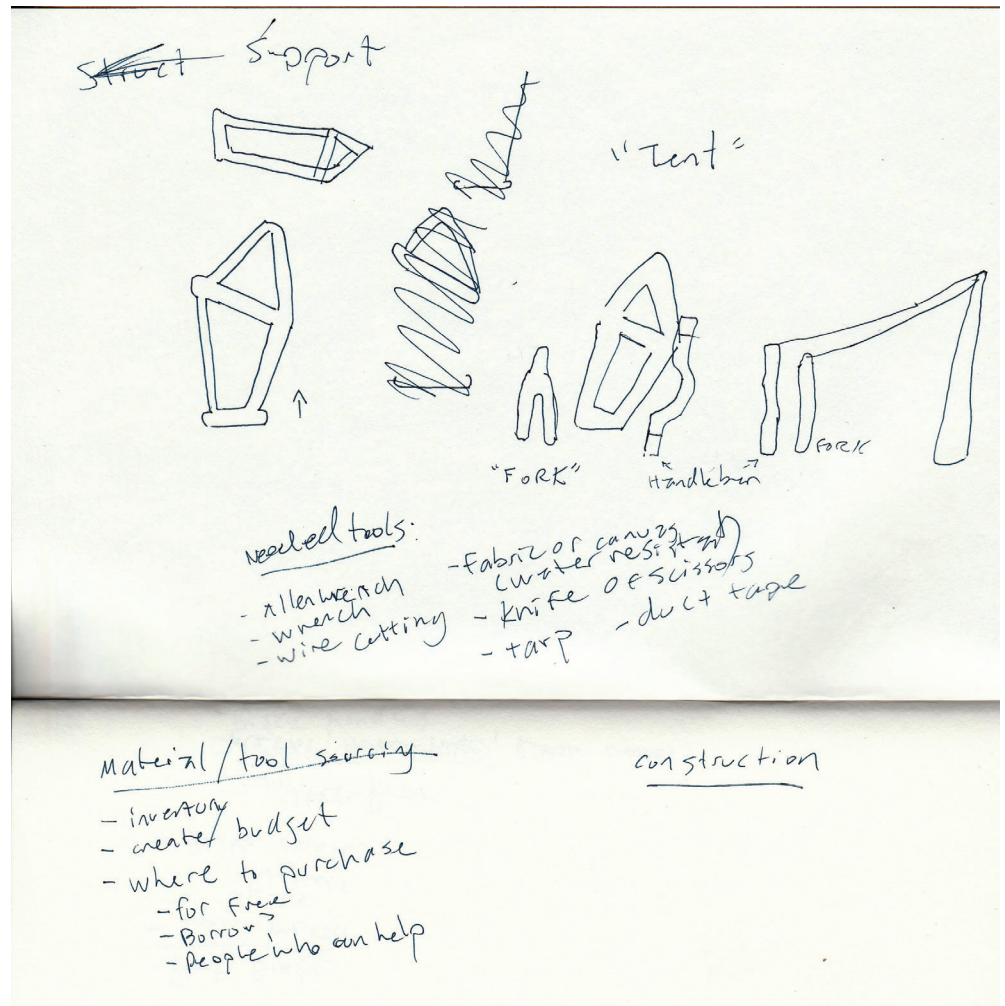


Fig A-2- (Top Right) Study of bicycle shapes and ideation of potential making.
(Bottom Right) Listing of tools, additional materials needed, and plan of action.

By simplifying the complex system of components to a series of shapes provided the bridge from addressing an unapproachable object to experiencing intuitive leaps. The first leap was in recognizing a simple shape, the second was in one or two ideas as to what would be easiest to make with that shape. The question "What can you make with this bike?" without building to intuitive thinking, or new ways of knowing, would undoubtedly return the reply "Why, another bike."

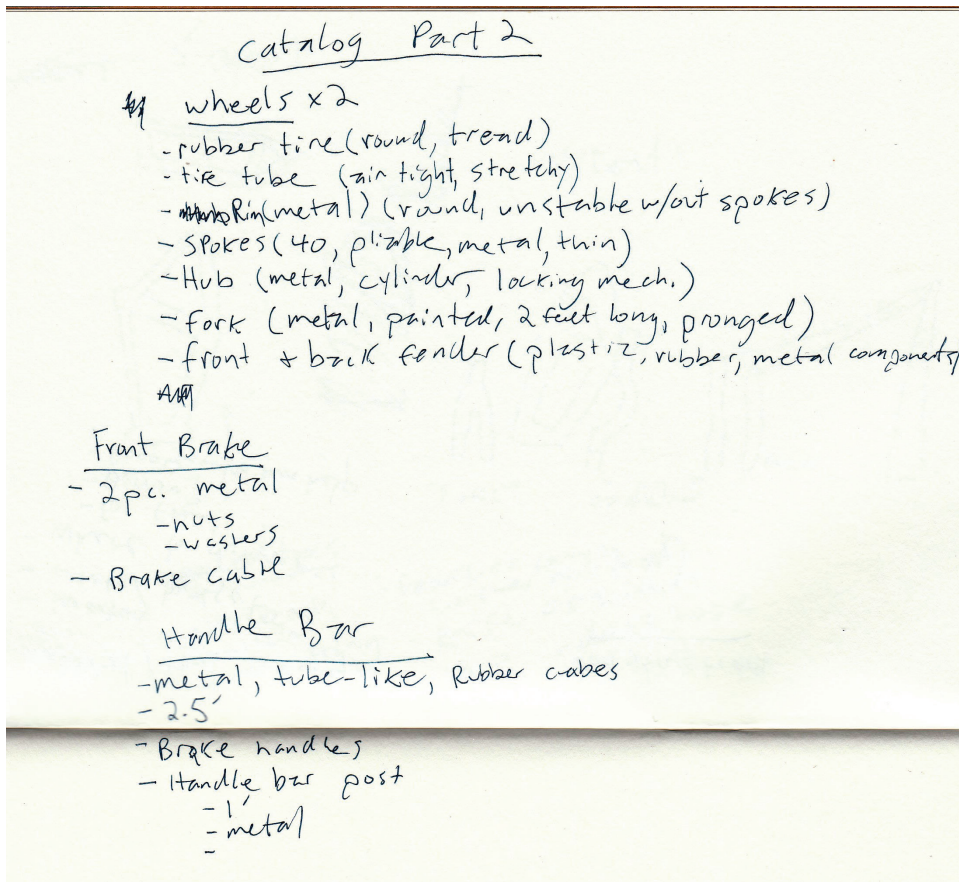


Fig A-3- Second iteration of component cataloging, inclusive of materials and component characteristics

7) Re-evaluate your object, its forms, and materials. Can you use more of the components or system to help in your making plan? Can they be used for anything else?

- This prompt was discussed verbally- ideations were not written at this point. The first stage of ideation was simple, a tent. By establishing a context, my collaborator was able to notice and identify that different parts of the bike could be allocated to cooking, laundry, and other systems that would compliment the construction of a tent.

8) Catalogue the components of the object, compile them in detail. Consider the materials the components are made of, list the materials (or your best guess) and characteristics of the piece.

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Additions to this guided making session, had time allowed, would have consisted of another round of making ideation using the new, more detailed catalogue, as a starting point. An idea would then be selected, making planned, followed by the actual making and execution of the plan.

This conversation, drawing, and reflection allowed for a prototyping of how I would conduct the guidance of an improvisational making in an informal setting. The conversation and feedback in the moment allowed us to refine the process and to discuss the efficacy of different stages. I will also note that this exercise exceeded the format I had established, the repetition of cataloging and ideation were improvisations based on my observations of my friend's understanding and existing ability. The principle of repetition is one common to many avenues of learning, Sennett establishes repetition as a method of determining what has been done, and how. In this instance, the act of repetition has the potential to invite the observer to re-evaluate the object as a collaborator in making. The components, composition, and forms now all provide feedback directly to the observer as to what is possible. The workbook that proceeded from these prompts is discussed in section 3.

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Informal Guided Making

This section is told as a story through pictures and the verbal prompts that were exchanged through a session of informal guided making.

Question: "I have these pants, do you think you could use them? I don't want to throw them away"

Response: "I could use them, but it would be better if I showed you what you could do with them."

Anxiety: "I'm not really a maker."

Support: "Let's make together, I think it will be easier after you've had some guidance and help"



"Familiarize yourself with your object. Draw the shapes that you observe.

Count and record how many there are. "

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“Feel your object, find the subtle shapes.”



“Notice that this is a tube, this is a shape you don’t have to sew. Think if this is a form you want to take advantage of.”

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Revelation occurs. "I've been wanting to make fabric planters, this is perfect!"



A moment of stitching teaching is offered and received.





The maker finds confidence.
The vision, guided by the
material form, is realized.



Torn jeans now exist as a
home for a potted plant.

THE APPENDICES

Thoughts on Collaboration

In each of the three prompted makings there was a recurring element- a willing collaborator who accepted an invitation to learn, make, and discuss with me. It cannot be overstated the incredible role the influence and support of others have in the development of a practice. As I considered the development of resilience it was clear- whether a person is a confident maker or an uncertain beginner- we are more confident and more engaged in the process when there is someone else involved.

With Jean, there was a level of generosity extended to me and my practice. I gave her a tarp and, instead of letting her decide how she would use it, I put a wrinkle in her plans and demanded, in friendly letters and words, that she replace something that she used regularly.

With my visiting friend I asked if she would be willing to do project work with me. We don't get to visit often and I was reluctant to prioritize her or school. She was excited for the exploration, and since the guided reflection has reminded me every conversation that she is eager to have a copy of the workbook that was built from our conversation. Without the space to talk through the process, I would have missed the balancing half of developing a practice- repetition, refinement, and reflection.

Making with Josh was a shortened repetition of the guided making exercise conducted with my high school friend, though verbal and drawn observations were replaced with material investigation and making. Josh had offered me material that, he hoped, would provide me with research supplies. In return it would solve a problem he'd been sitting on for the better part of a year- what to do with pants he'd wanted to repair, but never got around to doing? He was hesitant when I invited him to make with them instead of giving them away.

Each of my collaborators expressed that the experience was positive. It was not, however, habit developing. Each of them was a brief indulgence, but did not have a lasting impact. It became very clear that one experience in isolation of daily life was not enough to instigate a continuing practice and lasting change.

I was able to translate these experiences with others into a surrogate of myself in a workbook that would provide a similar, guided process though developing a habit and beginning a personal material practice.

Appendix B

The Role of a Material Practice in Resilience- From the Literature

This section includes reflections on practice from literature, namely from writings by Richard Sennett and David Pye. These characteristics of practice are correlated either to corresponding characteristics of resilience, or serve to directly address obstacles to resilience.

What is practice? Myself, Sennett, Pye	What is resilience/what builds resilience? Myself, Zolli, or Duhigg
<p>Concentration - "The ability to concentrate for long periods comes first; only when a person can do so will he or she get involved emotionally or intellectually. The Skill of physical concentration follows rules of its own, based on how people learn to practice, to repeat what they do, and to learn from repetition." (Sennett, 2008, p. 172)</p> <ul style="list-style-type: none"> • Ability to concentrate for long periods of time comes first, skill comes with/after extension of focus 	<p>Increased ability to concentrate builds up other attributes of resilient thinking, behavior, and practice. Concentration orients one to focus on the long term objective. Decreased ability to concentrate on difficult or detailed tasks leads to a priority towards short term objectives or rewards.</p>
<p>Rhythm- practice, repetition, anticipation (Sennett, 2008, p. 176)</p>	<p>Progress and pause come in phases, learning to navigate and work within these phases invites comfort</p>
<p>Knowing through making (other refs)</p> <ul style="list-style-type: none"> • use of tacit knowledge- skills that are learned by doing, not by telling • Hand motions, posture, thoughts, attention • Foundation of need, craft, criticism, and improvisation along with the inherent willingness to allow the doing and making to take the lead 	<p>Improvisation and adaptation</p>
<p>Path of least resistance</p> <ul style="list-style-type: none"> • Working with the tendencies and natures of matter • Design for material vs material for the design • Least resistance vs most resistance (potentially) (Sennett, 2008, p. 216) • -"Finding the most forgiving element in a difficult situation" (Sennett, 2008, p. 221) 	<p>"To improve your resilience is to enhance your ability to resist being pushed from your preferred valley, while expanding the range of alternatives that you can embrace if you need to." (Zolli, 7)</p>

THE APPENDICES

What is practice? (Cont) Myself, Sennett, Pye	What is resilience/what builds resilience? (Cont) Myself, Zolli, or Duhigg
<p>Knowing when to let go- letting go momentarily to get a better view, then pick it up again</p> <ul style="list-style-type: none"> • Letting go of fear or obsession • Letting go of control over others • Letting go of control over exact outcome (Sennett, 2008, p. 151) 	<ul style="list-style-type: none"> • Mindfulness (Zolli & Healy, 2013) • Emotional currency (Duhigg, 2014) <p>Uncertainty and fear of change or loss of control can lead individuals and organizations to reduce external inputs to their function and decisions.</p> <p>The act of putting down a problem, or a frustration, builds up the malleability of our expectations, allowing us to be comfortable with a multitude of outcomes.</p> <p>Making as a mode of meditation, & reflection as a mode of meditation- take my sweater unraveling- I used a physical connection with material as a mode of grounding- sweater works and felting can be a series of small case studies that build to a larger conclusion</p>
<p>Intuitive leaps- reformatting, adjacency, surprise, gravity- intuition that something that isn't yet could be (Sennett, 2008, p. 209)</p> <ul style="list-style-type: none"> • "If...?" "What if...?" • Reformatting <ul style="list-style-type: none"> -Taking a familiar practice or tool and applying it elsewhere/in a new fashion • Adjacency <ul style="list-style-type: none"> -Proximity of two things suggests use of the one for the other, even if it was not intended for that • Surprise <ul style="list-style-type: none"> -"Surprise is a way of telling yourself that something you know can be other than you assumed" • Gravity <ul style="list-style-type: none"> -There is no magic, problems are not solved until they are addressed -Iteration becomes a critical component of addressing one issue, then another (me) 	<p>Confirmation Bias- "I got what I wanted, I'll remember this! When confronted with an unexpected result, however, the information was often not committed to memory at all." (Zolli & Healy, 2013, p. 208)</p> <p>We have a preference towards results that confirm our expectations, we might not even cognitively process results or data that is contrary to our expectations.</p> <p>The active practice of adjusting expectations and roles of objects, increasing our comfort with unanticipated outcomes, and an excitement for unresolved issues as opportunities to learn and develop as opposed to absolute obstacles all coordinate as the development of practice and resilient characteristics. We would not need to politely ignore undesired outcomes</p>

MATERIALS OF RESILIENCE

What is practice? (Cont) Myself, Sennett, Pye	What is resilience/what builds resilience? (Cont) Myself, Zolli, or Duhigg
<p>Awareness</p> <ul style="list-style-type: none"> • Awarenesses open avenues of tools, materials, objects, surroundings to serve as tools of curiosity and innovation • “This is a ___, it can do/become ___” 	<p>“To improve your resilience is to enhance your ability to resist being pushed from your preferred valley, while expanding the range of alternatives that you can embrace if you need to.” (Zolli & Healy, 2013, p. 7)</p> <ul style="list-style-type: none"> • Reduce material needs • Learn to use a wider array of resources • Invent new technology • Modify tools from one use for another • Learn to collaborate with others (Zolli & Healy, 2013)
<p>Reflection</p> <ul style="list-style-type: none"> • “What did I do? How do I do it again? How do I not do it again?” • Backwards reasoning- sensation routing back through to cause • My hands felt like this and this happened- if I make them feel the same way next time, the same result will happen • Diminishing the fear of making mistakes • Dwelling in error longer to understand what caused the error <p>(Sennett, 2008, p. 157)</p>	<p>Skills may build a repeating pattern that grows into a foundation, but resilience is not built on only operating in the same way, with the same outcome, again and again.</p>
<ul style="list-style-type: none"> • Minimum necessary power • Blind, brute force is counterproductive <p>(Sennett, 2008)</p>	<p>Understanding when to push and when to pause is a key component in navigating difficult situations. There are times where power is progress and pushing through resistance is the only path forward. There are many more circumstances where a partnership with the material, the person, the circumstance, the difficulty, will direct us towards weak points that only require a light touch. If we push first with brute force, as it were, we miss these light touch opportunities that reduce damage or unstable outcomes.</p>

Appendix C

Materials of Resilience Research Project: Exit Survey

Thank you for your participation in this research project. It was initially created to explore building resilience in preparation for difficulties or crises. This exit survey has been reformatted to give you the opportunity to share your experience with the workbook while in a crisis, as you have completed or attempted the exercises during a global pandemic. You are invited to share your answers to the questions in long or short form.

- 1 How has your understanding of resilience changed?

- 2 How would you rate your personal self reliance, or ability to rely on yourself for your own needs?
Use a scale from 1-10 to indicate your response, 1 being very low, and 10 very high

- 3 How would you rate your problem solving skills?
Use a scale from 1-10 to indicate your response, 1 being very low, and 10 very high

- 4 How would you rate your current making ability?
Use a scale from 1-10 to indicate your response, 1 being very low, and 10 very high

Materials of Resilience Research Project: Entrance Survey

- 6 How has making helped you address a problem you can't solve?

- 7 How well do you respond when something doesn't turn out the way you expect it to?
Use a scale from 1-10 to indicate your response, 1 being very negative, and 10 very positive

- 8 How hard is it for your to keep doing a task when you find it difficult to do?
Use a scale from 1-10 to indicate your response, 1 being very difficult, and 10 very easy

- 9 Has making helped you cope with a difficult situation in your life?

- 10 How difficult do you feel it would be to have a new challenge occur at this time in your life?
Use a scale from 1-10 to indicate your response, 1 being very difficult, and 10 very easy

Materials _{of} Resilience

A Workbook

Introduction

What is resilience? Some would propose that resilience is the ability to endure, to overcome obstacles. Others would suggest it is mental strength and the perseverance to accomplish goals. However we define it, resilience is a critical aspect to how we address change, loss, disappointment, as well as how we are able to express agency in how we proceed in our own way through uncertainty.

So what does making have to do with resilience?

These exercises were developed in Vancouver, BC, Canada, a city in a region that sits on a fault line. Most of the area's inhabitants are aware that at some point in the future, natural disaster will strike and the consequences will be severe. In our world the frequency of natural disasters has increased dramatically in the last 50 years (ref). Unfortunately, in spite of these realities, the level of preparation is limited largely to A) buying a kit and tucking it away to gather dust, or B) hope that nothing happens.

This line of thought led to the question- Why are we so unprepared? If resilience, defined by the author, is the capacity to adjust, to endure, and to be able to solve one's own problems, how are we resilient against loss if our way of preparing for it is to buy something, or do nothing?

Here we get to the making.

The exercises in this workbook are designed to guide the development of your personal awareness of the things around you and what their potential is. The practice of completing daily exercises serves to begin to embed, or internalize, a way of thinking that can allow you to see the objects around you as systems of potential. The workbook also provides space to develop your making skills and begin cataloging knowledge, thoughts, resources, and the results of your makings. These exercises are intended to accompany a series of reinforcing workshops, but can be completed without them.

It is, however, encouraged that you find others to make with you. It can feel overwhelming to learn how to do everything we may wish to know in order to be resilient, and even self reliant. Building a community of making can reduce the burden of knowledge and reinforce the practices and experiences you have while making, thinking, and enjoying.

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Preparatory Reflections

These exercises are designed to guide the development of your personal awareness, the practice of completing daily exercises serves to begin to embed, or internalize, skills and abilities into your daily life.

As you begin the process of using making to become more resilient, please consider the following:

What does resilience mean to me?

What is the role of self reliance in my resilience?

What do I want to accomplish in order to become more resilient or self reliant?

What relationships do I need to change in order to become more resilient?

What obstacles do I have to becoming more resilient or self reliant?

How can I overcome those obstacles?

The next two weeks consist of 2 weeks of daily exercises where you will be invited to practice and learn skills, improvise while making, and navigate uncertainty and adaptation. There will also be three days where you will be invited to make with others. The first week is structured to aid you in practicing "informed making." You will also be developing "material awareness," which can be described as developing an awareness of what objects occupy your life, what they are made of, and what they can be. This builds the capacity to move past a static relationship with objects, e.g., "This is my couch. This is my cabinet.", and shift to "This couch is ____, has ____, and if I take it apart, I can make ____." The second week focuses on continuing your practice in informed making and will help you practice addressing the obstacles you may face in learning and taking on new challenges.

Informed Making Cycle- The informed making cycle is the foundation upon which you will begin to build your own practice of material exploration. Each phase of the cycle is step in building your awareness of the objects and resources around you.

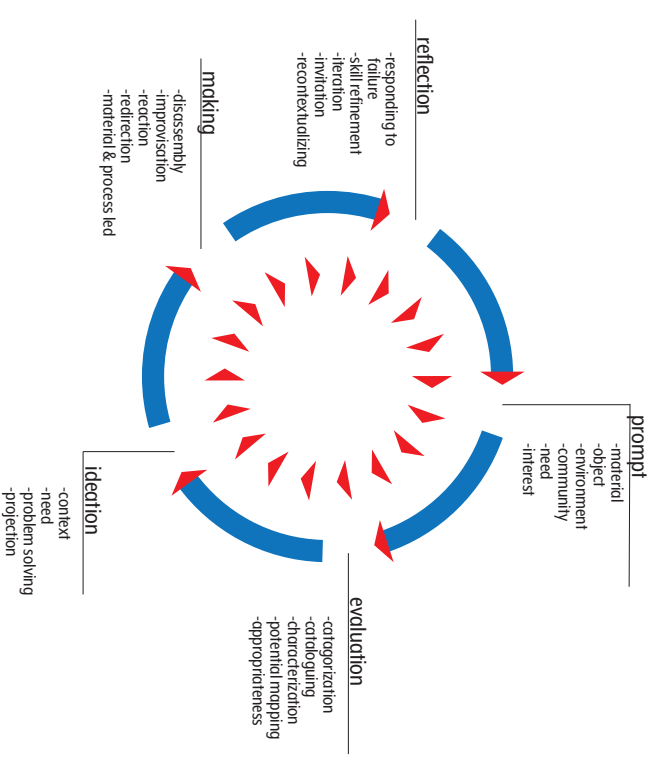
Prompt- serves as the initiation of the making action- this can be materials, objects, needs, interests, and anything else that serves to inspire and begin the process of making.

Evaluation- is the point where you take the materials you have selected. In this workbook it will be objects from your surroundings, and familiarizing yourself with them and compiling lists and characterizations of what the objects are- material, form, components, etc.

Ideation- follows evaluation. It is important to first become familiar with your chosen object and resource. As you plan your making and explore potentials you use the form and character of the material as the foundation for your ideas. Instead of trying to force what's available into what you want.

Making- comes after ideation, but does not require that ideation is complete. Reaction and improvisation are critical aspects of the material directing the making process. It is through making and responding that you will begin to develop the ability to process failure, uncertainty, scarcity (not always having what you think you need), and discomfort.

Reflection- is how you will begin to recognize how you are becoming more resilient. You will also use your reflection to help refine and direct the next iteration of making- where you will set goals and decide new avenues to explore



Daily Material Warm-up Tracker

Date	Description of Warm-up

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Pre-work: Resource Cataloging

Before beginning the exercises, take time to catalogue your resources. List the tools and skills you already have. Maybe you have a hammer and nails, maybe you have lots of paper and string, maybe you are very talented at identifying different plants. Please also note the people in your community who are resources. You may know people with lots of skills who would almost certainly be happy to teach you. You may know people who are creative and resourceful who inspire you or make you laugh.

Feel free to continue to add to this list as you progress through the exercises. There is an extra chart on page 79.

Tools	Materials	Skills	Community

In your pre-work exercise you were invited to include your community- those with whom you are creative, those whom you can teach, and those who can teach you. The second day will involve an act of social making. Find at least one other person who can make with you on Day Two. This person doesn't have to be someone you know well, just someone who would like to make with you- you can even invite more if you'd like! You will also want to start collecting materials that you can make with. In the first Social Making exercise you will practice different making skills and begin to learn how to use improvisation in making.

You will also be developing the skills of deconstructing objects, or taking them apart, and learning how to put things back together. Practicing these skills with someone else will make it less intimidating to dissect and bring new life to objects that you might have thrown away. After all- didn't Frankenstein have Igor?

Day One will help you begin to categorize and study the objects around you, be on the lookout for what you might want to set aside for Day Two.

Day One: Observing, Categorizing, and Story Telling

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

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Day One: Observing, Categorizing, and Story Telling

Look at the objects that occupy a space in your life. You can start at home, work, school, or in places of play. You will spend the next 5 days focusing on this space. Begin to categorize what you find in the space below and on the next page. Consider how you use them, how they're intended to be used, the shape, material, similar shapes and forms. Think about where the objects might have come from, or where the material that was used to make them originated from. Consider where the objects might go when you don't have a use for them anymore. Use these suggestions, and any other way you feel you would like to group the objects and material around you.

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Other things to consider: Are they everyday objects? Or are they uncommon with a specialized purpose? Is the object a necessity and you can't live without it? Or is it a luxury that you enjoy having? Is it something you use regularly? Or does it just sit on the shelf? Does it have emotional value?

For Day Two select some of your observed materials and resources to use for your social making. Think about materials that are easy or exciting to make with- fabric, rope, tools, old furniture, etc. Think also about what objects you would like to study with the person you have invited.

Date _____

Time used _____

Day Two: Social Making
Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

Day Two: Social Making

With a friend, or more than one friend, find a safe space to make. In this space you are invited to develop skills that will become a foundation of your making. For this first social making exercise you will focus on skill building and practicing improvisation in making. 30 minutes for each portion will give you adequate time to practice, though 45 minutes for each portion will ensure you have enough time to practice, reflect, write, and discuss together.

Skill Building

Choose a skill to practice from pages 72-75. You may also choose to practice another making skill not included in this workbook. Practice this skill until you feel you can use it without using a guide. As you have time, choose more skills to practice until your 30-45 minutes are up.

Use the space below to detail the skills you have practiced. What was easy? What was difficult? What goals can you set to keep practicing?

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Improvisations

Improvisation in theater is built on listening to others and exercising non-judgment, and that includes judgment of yourself. These exercises are intended to help you, and those you've invited to make with you, learn how to accept that we don't always have control over how things turn out and to practice responding to the unexpected. You will also be able to practice building with other people instead of against them as plans change.

For the next 30-45 minutes gather your making materials and choose an improvisational exercise from pages 76-77. Each improvisation will take 5-15 minutes depending on how many people you have invited. Feel free to create and record your own improvisational exercises.

Use the space below to sketch and describe your improvisations. Record your makings, innovations, questions, observations, and any surprises you may have encountered.

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How do you think social making can help you become more resilient? What do you feel were your obstacles, if any, in becoming more resilient?

How do you plan to continue practicing what you've learned during this making exercise for the rest of this week? Write out your practice plans, detail skills you want to develop or practice, any tools you want to become familiar with, and any materials you are curious about. You may also want to include your daily warm-ups in this plan.

Day Three: Single Object Study- Forms and Shapes

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

Day Three: Single Object Study- Forms and Shapes

Now that you have spent time familiarizing yourself with the objects around you, choose one to study. This study is intended to begin the process of determining the function, composition, and new life of the object. It would be wise to choose something that you no longer have a use for, would like to throw away or get rid of, or would like to replace at some point in the near future. You may also choose something that you would like to learn more about, or study in great detail. Note that this object will be taken apart on Day Four.

Why did you choose this particular object?

Once you have chosen your object, draw it in detail in the box below.

18

Look at the object again. What shapes do you see? Redraw the object as a series of shapes. Catalogue and list the shapes. How many of each shape are there? Consider different sizes or unexpected places where you might find shapes or forms. A tube is a very long cylinder; it can be viewed as a line, a circle, even a series of joined lines.

Shape, Size, Qty

Ex: <div><div><div>10"</div><div>x 6</div></div><div><div>1"</div><div>x 2</div></div><div><div>3"</div><div>x 1</div></div><div><div>4x20"</div><div>x 1</div></div></div>	

Date _____

Time used _____

19

Day Four: Single Object Study- Projection & Cataloging

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

Day Four: Single Object Study- Projection & Cataloging


Study your object again and review the previous exercise. Choose a shape, or a series of shapes from your shape and form study. What could you make? Use the box below to sketch ideas. Use the compendium on page 81 to help with forms and to organize your ideas.

If you were to build one of these forms today, what other materials would you need? Create a list of other materials, tools, and resources you would need to gather to execute your plan.

Once you have explored a scenario, take time to examine other parts of the object that you may have overlooked. Could they be also be used? Example: If you had chosen to build a tent, other parts of the object could be used for cooking, or for bedding. Draw your ideas and continue to explore how you could use multiple parts of the object for the same or different scenarios. You may use the compendium on page 81 to help you with ideas.

Begin to catalogue all of the object's components. Describe the component, the material, the characteristics, and the potential use or application. If you are not able to disassemble the object at this time, complete the exercise without disassembly, but it is recommended you also choose an object you're able to take apart and fully catalogue. This is an opportunity to

MATERIALS OF RESILIENCE

Component	Material	Characteristics	Use/Application
Ex:  Bike Frame	Metal- aluminum	Triangle shape, tube, rigid, cannot disassemble without cutting	Frame- part of structure, drying rack, wall

Date _____

Time used _____

Day Five: Single Object Study- Disassembly & Making

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

Day Five: Single Object Study- Disassembly & Making

Now that you have developed your skills in study, cataloging, and idea projection, you will proceed to the next stage of taking action on one of your plans. Choose one of your making ideas from the previous exercise. Use the space below to create a making plan. Sketch what components you need, what tools, other materials, etc.

After you've made your plan compile what you feel you need to make. If you don't have the tools you feel you need to make, consider your resource chart- is there anyone who could lend you the tools you need? Can you approximate the tool or use a substitute?

Find a space and make!

Some words of encouragement: We can explore challenges by working with materials. These explorations have the potential for failure. Through the navigation of failure we are able to develop the emotional responses needed to make sense of these challenges. Arts and crafts provide safe space to practice failure, to develop emotional capacity to access innovation and exploration within and through failure. It also allows for thinking outside of 'right' or 'wrong' interpretations of outcome. Not all plans will work out as you expect them to, these changes in expectation are an opportunity to become more resilient by adjusting expectations, or changing your plans to better complement the outcome.

MATERIALS OF RESILIENCE

Use the space below to draw, think, document your experience, write questions, your frustrations. Everything you experience in this making exercise is the beginning of your personal practice of making and becoming resilient. Journaling will provide you with the opportunity to reflect and record your experience. It will provide context for your future explorations and development.

Date _____ Time used _____

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Day Six: Single Object Study- Full Making Exercise
Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

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Day Six: Single Object Study- Full Making Exercise

Review the last 5 days, you will be completing all of the steps detailed in days 3-5 again today.
Choose an object that you want to study and make with. Draw the object below

Choose shapes and forms and sketch your making ideas using those shapes

Choose one of your making ideas, what tools, materials, and resources do you need to make it?
Detail other ways you can use other components of the object.

Use the space below to detail the shapes and forms of the object

MATERIALS OF RESILIENCE

Catalogue in detail the object's components

Create your plan for making. Please also document your making and skill practices. Write down any questions, reflections, and learning.

Component	Material	Characteristics	Use/Application

30

31

Tomorrow you will conduct another social making exercise, set any goals below for how you want to practice the skills you developed this week, what you could teach, what you want to learn, and how you can use them to make with others.

Date _____

Time used _____

Day Seven- Social Making
Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

Day Seven- Social Making

With a friend, or more than one friend, find a safe space to make. In this space you are invited to develop skills that will become a foundation of your making. For this second social making exercise you will focus on skill building, improvisation in making, and purpose driven making. 20-30 minutes for each portion will give you adequate time to practice, though 30 minutes for each portion will ensure you have enough time to practice, reflect, write, and discuss together.

Skill Building

Choose a skill to practice from pages 72-75. You may also choose to practice another making skill not included in this workbook. Practice this skill until you feel you can use it without using a guide. As you have time, choose more skills to practice until your 30-45 minutes are up.

Use the space below to detail the skills you have practiced. What was easy? What was difficult? What goals can you set to keep practicing?

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Improvisations

For the next 20-30 minutes gather your making materials and choose an improvisational exercise from pages 76-77. Each improvisation will take 5-15 minutes depending on how many people you have invited. Feel free to create and record your own improvisational exercises.

Use the space below to sketch and describe your improvisations. Record your makings, innovations, questions, observations, and any surprises you may have encountered.

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Purpose Driven Making

Purpose driven making is structured as an open ended making exercise. What you make is dependent on what materials you have at hand, the people you're making with, and how you interpret the purpose or need. You will have built throughout the week that will have strengthened your ability to now address scarcity and need through making.

In this new action you will choose a prompt from page 78. You may choose to print them as prompt cards and draw one as a surprise prompt. When you choose the prompt you and those you've invited to make will use your skills of putting things together, taking them apart, simple machines, and anything else you have learned to make something that serves that purpose. Take 20-30 minutes to make. If you find you have accomplished the goal to the group's satisfaction, choose another prompt and make again until your time has ended.

Detail your making below: how did you respond to the prompt? What materials did you use? What skills did you use and exercise? What are your observations from the making?

How do you plan to continue practicing what you've learned during this making exercise for the rest of this week? Write out your practice plans, detail skills you want to develop or practice, any tools you want to become familiar with, and any materials you are curious about. You may also want to include your daily warm-ups in this plan.

Take a moment to discuss with your making companions your collective and individual experiences in this social making exercise. How has today's experience, and the exercises this week, developed you outside of the making? What do you now feel you can do as a result of these practices and new habits?

Date _____ Time used _____

MATERIALS OF RESILIENCE

Last week you practiced observation, evaluation, ideation, making, reflection, and then repeated the cycle by starting to build your own prompts. This week you will find yourself seeking out new environments to study and you will begin to lean more on your improvisational skills. If you have taken the time to practice making skills each day, you will find it is much easier to worry less about how you're making, and you can focus more on where you are and what you have available too. You may also find that you have identified more obstacles to feeling you have succeeded in making.

This week will also place you in positions to address obstacles and to think more specifically about using making, improvisation, and an awareness with what is around you as a means of solving problems and overcoming obstacles.

I invite you to think, as well, about how you will continue your making and practice after you have completed the exercises in this workbook.

Day Eight: Environment Study

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

Day Eight: Environment Study

Choose an environment you would like to study. Environments are complex systems filled with many objects and beings. You have previously studied your home environment. Opportunities to make, explore, study, and solve problems come in all places around us. Choose an environment that is interesting to you, or one that you spend a great deal of time in. Beaches, parks, backyards, offices, friend and family homes are all environments you might study.

You may not always be able to choose where you are when you have a need that can be answered through making. This exercise is an invitation to transition from needing a specific place to make to recognizing that making can occur anywhere.

In the space below catalogue the objects and being inhabiting the environment. Use the skills you have previously exercised to describe and organize what you see and find.

Use the space below to detail the objects and beings you feel are helpful in making. What could you make with them?

Can you make with just the materials and objects in your environment? What else do you feel you need to make? How can you adjust your ideas to work with the environment instead of against it?

MATERIALS OF RESILIENCE

Use the space below to plan what you will make. You may find it useful to use previous days as a model for how you can approach this new space. Document your making and reflections about the experience of making somewhere new. What was difficult? What was unexpected? Write down any questions, reflections, and learning.

Date _____ Time used _____

42

Day Nine: Place Based Making

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

43

Day Nine: Place Based Making

Choose a new environment you would like to make in. You may bring tools and materials with you, but you are encouraged to limit what you bring with you and what you intend to leave behind.

In the space below catalogue the objects and being inhabiting the environment. Use the skills you have previously exercised to describe and organize what you see and find.

Use the space below to detail the objects and beings you feel are helpful in making. What could you make with them? Do you have specific needs in this environment? How can your makings meet your needs?

Can you make with just the materials and objects in your environment? What else do you feel you need to make? How can you adjust your ideas to work with the environment instead of against it?

MATERIALS OF RESILIENCE

Plan and document your making below. Be aware of what is permissible to use- are there certain objects or materials you need to ask permission to use? Are there things that you should not use or inappropriate for you to use? If you are making in an environment that is shared with others, consider how what you make contributes to the way others use the space. If it obstructs how they use it, what is the reason for obstructing their use? Does this build your community?

You are encouraged to use the skills you have developed from previous exercises- you may choose to use them as a reference or model for your making today.

Date _____

Time used _____

46

Day Ten: Improvisations

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

47

Day Ten: Improvisations

Tools: We often avoid making or taking on challenges because we feel we do not have the appropriate tools, use the table below to study 4 different tools you feel you need in order to make. Draw the tool and describe how it is used. Draw how it is useful, does it have a specific shape- like the screwdriver? What can you use as a substitute? Do you have materials or objects around you that can approximate the tool? You may use page 83 as a reference or starting point if you are uncertain.

Tool	Useful Shape	Substitution

Speed Making: Find a place to make

Set a timer for 1 minute- find something (object or material) to make with before the timer goes off.
Set your timer for 2 minutes- make something with what you found before the timer goes off.
Use the space below to document your making. What did you learn about sourcing materials?

Speed Making: Find a new place to make

Set a timer for 5 minutes- Collect your making materials before the timer goes off.
Set your timer for 15 minutes- make something with what you found before the timer goes off.

Speed Making: Find a new place to make and choose a skill you want to practice, if your skill involves specific tools be sure to have them prepared before starting the exercise
Set a timer for 5 minutes- Collect your making materials before the timer goes off.
Set your timer for 20 minutes- make using only the materials you collected and the skill you want to practice.
Use the space below to document your making.

In this exercise you were prompted to address new environments and scarcity of materials, time, and tools. Reflect on your experience. What was difficult? What was easy? How do you think these exercises might aid you in becoming more resilient? What skills do you now wish to practice? Note that the more you practice a skill, the easier it is for it to be second nature.

Date _____

Time used _____

50

Day Eleven: Single Object Practice

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

51

Day Eleven: Single Object Practice

Repetition of exercises is critical in the further development of skills, abilities, and awarenesses. You will have grown significantly since you last studied a single object. Take note of the things you recognize now that you may not have before. Choose an object that you want to study and make with. Draw the object below

Choose shapes and forms and sketch your making ideas using those shapes

Choose one of your making ideas, what tools, materials, and resources do you need to make it? Detail other ways you can use other components of the object.

Use the space below to detail the shapes and forms of the object

Catalogue in detail the object's components

Component	Material	Characteristics	Use/Application

54

Create your plan for making. Document your making and skill practices. Write down any questions, reflections, and learning.

55

What have you learned since the last time you completed this exercise? How do you feel you have changed as a maker? What do you feel you still want, or need, to learn? Reflect on your experience this far and set goals for how you will proceed.

Date _____ Time used _____

During the next two days you will begin to structure your own exercises. You will continue to conduct your daily warm-ups, but you will only have a lightly structured format to follow. Consider the exercises that you enjoyed, or felt were the most beneficial.

Perhaps you have objects at home that you realize you want to replace, or are not longer functional- you might choose to use them as the prompt for your exercise and try to figure out how they can still be useful, or what other ways you might use them.

Maybe there is a beautiful park in a neighborhood near a friend's house and you'd like to invite them to come make with you in a new environment.

This portion of the workbook is built as an invitation to begin structuring how your own practice will continue after completion of the exercises.

Resilience is not built on one experience, but is the foundation that comes from daily choices and practices that will hold you steady in times of difficulty.

Day Twelve: Self Directed Practice

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

Day Twelve: Self Directed Practice

In the following sections detail the focus of your exercise. You may choose to make with an object, or several objects. You may want to practice in a new environment. Perhaps you want to practice making with others, or try a new skill.

Exercise Focus

-What do you want to do?

Objective or Goals

-What do you want to accomplish?

Tools & Skills

-What do you need and what are you practicing?

Materials

-What will you use?

Use the next two pages to structure and document your making and practice.

Day Thirteen: Self Directed Practice

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

62

Day Thirteen: Self Directed Practice

In the following sections detail the focus of your exercise. You may choose to make with an object, or several objects. You may want to practice in a new environment. Perhaps you want to practice making with others, or try a new skill.

Exercise Focus

-What do you want to do?

Objective or Goals

-What do you want to accomplish?

Tools & Skills

-What do you need and what are you practicing?

Materials

-What will you use?

63

Use the next two pages to structure and document your making and practice.

64

Date _____

Time used _____

65

Day Fourteen- Social Making

Daily Material Warm-up Exercise

Use the space below for your daily material warm-up exercise. You may use this space to work through the skills and to note thoughts, questions, experiences, etc.

66

Day Fourteen- Social Making

With a friend, or more than one friend, find a safe space to make. In this space you are invited to develop skills that will become a foundation of your making. For this last social making exercise you will focus on skill building, improvisation in making, and purpose driven making. 20-30 minutes for each portion will give you adequate time to practice, though 30 minutes for each portion will ensure you have enough time to practice, reflect, write, and discuss together.

Skill Building

Choose a skill to practice from pages 72-75. You may also choose to practice another making skill not included in this workbook. Practice this skill until you feel you can use it without using a guide. As you have time, choose more skills to practice until your 30-45 minutes are up.

Use the space below to detail the skills you have practiced. What was easy? What was difficult? What goals can you set to keep practicing?

67

Improvisations

For the next 20-30 minutes gather your making materials and choose an improvisational exercise from pages 76-77. Each improvisation will take 5-15 minutes depending on how many people you have invited. Feel free to create and record your own improvisational exercises.

Use the space below to sketch and describe your improvisations. Record your makings, innovations, questions, observations, and any surprises you may have encountered.

68

Purpose Driven Making

Choose a prompt from page 78. You may choose to print them as prompt cards and draw one as a surprise prompt. When you choose the prompt you and those you've invited to make will use your skills of putting things together, taking them apart, simple machines, and anything else you have learned to make something that serves that purpose. Take 20-30 minutes to make. If you find you have accomplished the goal to the group's satisfaction, choose another prompt and make again until your time has ended.

Detail your making below: how did you respond to the prompt? What materials did you use? What skills did you use and exercise? What are your observations from the making?

69

MATERIALS OF RESILIENCE

How do you plan to continue practicing what you've learned during this making exercise for the rest of this week? Write out your practice plans, detail skills you want to develop or practice, any tools you want to become familiar with, and any materials you are curious about. You may also want to include your daily warm-ups in this plan.

70

Take a moment to discuss with your making companions and record your collective and individual experiences during the last two weeks. How do you feel you have changed? What do you now feel you can do as a result of these practices and new habits? What do you want to do now as a result of this experience?

How do you intend to continue your making practice? What are your goals?

Note that there are additional social making and self directed open work pages on pages 84-100.

Date _____

Time used _____

71

Additional Pages

Developing Skills- Daily Warm-up and Social Making

Skills

Skills are defined as four different categories: understanding how to put things together, how to take things apart, understanding and using simple machines, and how to identify different materials.

Putting Things Together-

www.netknots.com

-has an incredible library of knots that have videos, picture, and text instructions. Go to their website and choose knots to learn. Knots that connect pieces of rope together, lashing knots, and stop knots are all very useful. Explore stop knots, binding and lashing, hitch, and bend knots.

Choose a knot to practice. Go throughout your home and tie the knot in different places and with different materials. Complete the knot successfully 10, 20, 30 times. Repeat the knot as many times and with as many different materials until you can tie it without thinking.

Think of something you want to make- can you think of how to make it using knots instead of nails, screws, or other fasteners? Practice lashing knots to tie two poles or cylinders together. Bamboo chairs are made by lashing together bamboo poles. What could you join together with these knots?

<https://en.wikipedia.org/wiki/Fastener>

-has a long list of pieces that connect two different objects or parts together. Fasteners hold together almost everything. Find out what fasteners you have in your home, see what you can use them to assemble.

https://en.wikipedia.org/wiki/Woodworking_joints

-joinery is another way to connect things together. It consists of fingers of wood that hold the pieces together. Choose a type of joinery and try to use it to connect two different objects or pieces.

Taking Things Apart-

Tools: Flathead and Phillips screwdrivers, shop knife, hammer, gloves, goggles,

Anything involving tools can be dangerous, exercise caution and care

1. Identify what you want to take apart. If you know what it is, you can confirm if it is safe to take apart.

2. Unplug everything!

3. Identify the basic parts. Are there doors, legs, covers? Look around for screws, seams, buttons- anything that you can begin with.

Example: If you're taking apart an old pair of pants, you would turn them inside out and see where the seams are.

Ex: If you're taking apart a wooden chair, turn the chair upside down and see if there are any screws you can remove

Ex: If you're taking apart a piece of electronics, look up instructions first, there may be parts containing electricity you should be aware of.

Parts you can remove: fasteners, nuts and bolts, clips, rivets, buttons, handles
Spots to look for: edges between parts, seams,

4. Remove everything that only takes a step or two. Start slow, with parts that you can remove easily. As you grow stronger in your skill you will be able to see more points where things can be taken apart or separated.

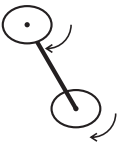
5. Try putting it back together! You'll learn twice as much taking it apart and putting it back together as you would if you just took it apart or put it together.

As you make more with the things you have taken apart, you'll be able to make, and the more you make, the more you'll be able to identify what is useful when you're taking things apart.

Simple Machines-



Lever- the force you apply (the down arrow) is amplified in the lift (the up arrow). This helps you lift things heavier than you can by hand. The length of the lever influences the amplification. Try it! Example: Scissors, wheelbarrows, and see-saws



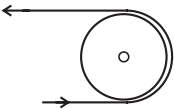
Wheel & Axle- Two disks rotating around a rod make wheel and axle.



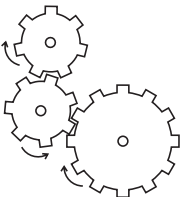
Rolling Rods- Heavy objects can be moved using rods when no wheel and axle are available. The rods need to be replaced under the object as it moves forward.



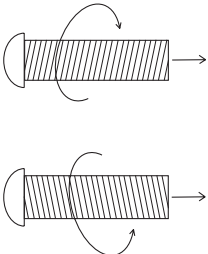
Ramps & Wedges- ramps and wedges decrease the force required to move an object up a height (ramp), or to reduce the amount of force required to split something (wedge)



Pulley- pulleys can increase the force you're pulling with, the number of wheels determines how much the force is multiplied by



Gear- You can use the gear or the axle to increase speed or force. Turning around the axle controls speed, turning around the wheel controls force.



Screw- it's like a ramp around a rod. The direction the ramp rotates determines which direction it moves when the screw is turned.

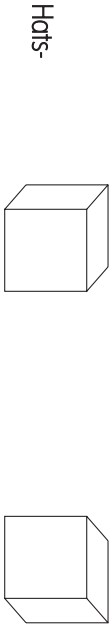
Material Identification-

Use your own knowledge of materials to begin filling out this chart. If there are materials that you're not sure about, look them up, or find an object made of that material and write down what you observe. These are very general categories, feel free to add more specifics or glue in additional pages.

Material	Appearance	Characteristics
Metal		
Plastic		
Wood		
Glass		

Improvisational Making Prompts

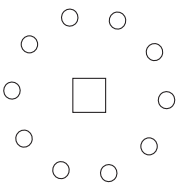
These prompts were compiled as individual cards and exercises were chosen for use in the workshop based on group investment and abilities. These prompts provide the setup, variations, and objective of each improv exercise. They are variations of theater improv exercises modified to facilitate making. You are invited to look up other improvisational games and see how you can modify them to practice improvisational making



Hats-

This is a game of taking turns and responding to the unexpected through making. Collect making materials and objects into two boxes, choose a wide variety of materials. Depending on the number of people, make a line by each box. A person from each line draws something from the box without looking. The two then take their object or material and use it to build together in the center. Each pair has one minute to make, then the next pair takes their turn pulling from the boxes and making for one minute. Continue making for as long as you can. You may disassemble the object in the middle and redistribute the materials and objects at any time and start the making again.

One Word Story (Or One Action Making)

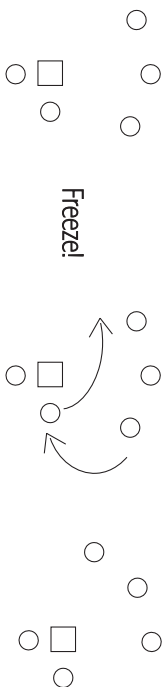


This game is an act of building and responding to the decisions of others. Have a collection of making materials and objects in the center of you and your making companions in a circle. In One Word Story, someone starts the story by saying the first word, the next person then adds to the story with one word. The story continues around the circle until you all decide the story is done. The same is done with the making, one person starts making by selecting material or an object from the center, they then have 30 seconds to make before the object is passed to the next person in the circle. The game is played best when those participating do not decide what action they will take before their turn, but respond to what has been done in the moment they take their turn.

You may stop the making cycle when you collectively feel you have completed your object.

Freeze

This is a game of responding to a sudden change in intention, it is best for more than 2 people. Gather your making materials and objects in the center and start the making with two people in the middle. The first person to say what they're making decides the pair's action while they make. If a person says "refrigerator", the pair then begins making a "refrigerator". Though something a bit less specific is easier, say "Something that has five legs". Those who are not making should allow for a minute or two of making before calling "Freeze!" The two makers then freeze immediately and one person hops in to tag a maker out. The new maker then says what the pair are making and the making cycle begins again.



The Gift

This is a game of taking turns giving prompts, and receiving and responding through making. Collect making materials and objects into a box, choose a wide variety of materials. Select an empty box to use in addition. Depending on how many people you have, stand in two lines on either side of the materials. One line acts as the giver, the other acts as the receiver. The giver line takes the box to the materials and selects something to put in the box secretly. The giver then gives the gift, to the receiver. The receiver opens the box and begins making with what is found inside. The receiver has 2.5 minutes to make with the material. They then place the made object in the making materials box. The giver then goes to the receiver line and the maker to the giver. The cycle is then repeated. The giver may choose made objects to put into the box.

Alternative: The receiver gives ideas of what the material or object could be made into, coming up with as many ideas as possible in a minute. The giver and receiver then swap lines.

Rhythmic Word Association

Choose an object or material to place in the middle of your group standing in a circle. Start a rhythm, you might keep time by clapping or stamping. Each person takes turn on the beat to say what could be made from the object or material. The goal is to continue on beat for as long as possible.

Guided Making Prompts

These prompts were compiled as individual cards and drawn at random to prompt the purpose driven group making stage of the workshop.

Something that is

warm

comfortable

for napping

for thinking

for having conversation

protective

spiky

useful

not useful

round

square

tall

strong

soft

comforting

inspiring

funny

Something that can

reach up high

send a message

defend

lift something else

hold water

help things grow

be loud

communicate

folded into something else

dispose

make someone laugh

move things

cover 4 people

wake someone up

be played with

help clean

push

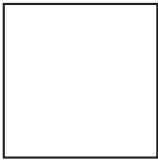
pull

Resources Chart Con't

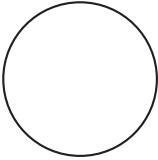
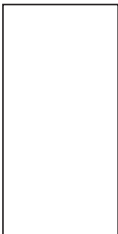
Tools	Materials	Skills	Community

Introductory Catalogue

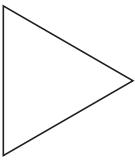
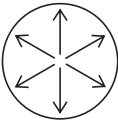
Shapes and Forms



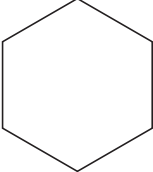
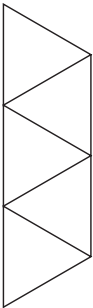
The square, and rectangle,



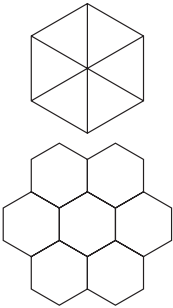
Stress is distributed equally along a circle, or an arc (half of a circle) and is not concentrated at any one point. This makes it the strongest structural shape.



The triangle is one of the strongest shapes as the angles of the triangle cannot be changed without breaking the triangle. It is used in building supports and trusses

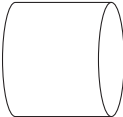
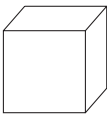
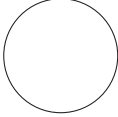


The hexagon





Compendium

Shape	Structure
	<div>Lean-to shelter</div> <div>A-frame shelter</div>

Compendium	
Shape	Structure
	
	
	

82

Compendium		
Tool	Useful Shape	Substitution
Flat head screwdriver		Coin, butterknife
Philips screwdriver		

83

Open Work Pages

In the following sections detail the focus of your exercise. You may choose to make with an object, or several objects. You may want to practice in a new environment. Perhaps you want to practice making with others, or try a new skill.

Exercise Focus

-What do you want to do?

Objective or Goals

-What do you want to accomplish?

Tools & Skills

-What do you need and what are you practicing?

Materials

-What will you use?

Open Work Pages

Use this page to structure and document your making and practice.

Open Work Pages

In the following sections detail the focus of your exercise. You may choose to make with an object, or several objects. You may want to practice in a new environment. Perhaps you want to practice making with others, or try a new skill.

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Social Making Pages

With a friend, or more than one friend, find a safe space to make. In this space you are invited to develop skills that will become a foundation of your making. For this last social making exercise you will focus on skill building, improvisation in making, and purpose driven making. 20-30 minutes for each portion will give you adequate time to practice, though 30 minutes for each portion will ensure you have enough time to practice, reflect, write, and discuss together.

Skill Building

Choose a skill to practice from pages 72-75. You may also choose to practice another making skill not included in this workbook. Practice this skill until you feel you can use it without using a guide. As you have time, choose more skills to practice until your 30-45 minutes are up.

Use the space below to detail the skills you have practiced. What was easy? What was difficult? What goals can you set to keep practicing?

Social Making Pages

Improvisations

For the next 20-30 minutes gather your making materials and choose an improvisational exercise from pages 76-77. Each improvisation will take 5-15 minutes depending on how many people you have invited. Feel free to create and record your own improvisational exercises.

Use the space below to sketch and describe your improvisations. Record your makings, innovations, questions, observations, and any surprises you may have encountered.

90

Social Making Pages

Purpose Driven Making

Choose a prompt from page 78. You may choose to print them as prompt cards and draw one as a surprise prompt. When you choose the prompt you and those you've invited to make will use your skills of putting things together, taking them apart, simple machines, and anything else you have learned to make something that serves that purpose. Take 20-30 minutes to make. If you find you have accomplished the goal to the group's satisfaction, choose another prompt and make again until your time has ended.

Detail your making below: how did you respond to the prompt? What materials did you use? What skills did you use and exercise? What are your observations from the making?

91

Social Making Pages

How do you plan to continue practicing what you've learned during this making exercise for the rest of this week? Write out your practice plans, detail skills you want to develop or practice, any tools you want to become familiar with, and any materials you are curious about. You may also want to include your daily warm-ups in this plan.

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Skill Building

Choose a skill to practice from pages 72-75. You may also choose to practice another making skill not included in this workbook. Practice this skill until you feel you can use it without using a guide. As you have time, choose more skills to practice until your 30-45 minutes are up.

Use the space below to detail the skills you have practiced. What was easy? What was difficult? What goals can you set to keep practicing?

Social Making Pages

Improvisations

For the next 20-30 minutes gather your making materials and choose an improvisational exercise from pages 76-77. Each improvisation will take 5-15 minutes depending on how many people you have invited. Feel free to create and record your own improvisational exercises.

Use the space below to sketch and describe your improvisations. Record your makings, innovations, questions, observations, and any surprises you may have encountered.

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Social Making Pages

Purpose Driven Making

Choose a prompt from page 78 You may choose to print them as prompt cards and draw one as a surprise prompt. When you choose the prompt you and those you've invited to make will use your skills of putting things together, taking them apart, simple machines, and anything else you have learned to make something that serves that purpose. Take 20-30 minutes to make. If you find you have accomplished the goal to the group's satisfaction, choose another prompt and make again until your time has ended.

Detail your making below. how did you respond to the prompt? What materials did you use? What skills did you use and exercise? What are your observations from the making?

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How do you plan to continue practicing what you've learned during this making exercise for the rest of this week? Write out your practice plans, detail skills you want to develop or practice, any tools you want to become familiar with, and any materials you are curious about. You may also want to include your daily warm-ups in this plan.

