



MONASH University

**Matters of co-facilitation:
A methodological inquiry into the role of co-design materials.**

Allison Edwards

*BA (Hon) Visual Communication
MA Interdisciplinary Design*

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ABSTRACT

As designers attempt to engage co-creation to address the wicked and complex challenges of our time, their use of workshops bringing together people with different areas of expertise and diverse backgrounds increases. To engage such diverse people and facilitate co-creation, designers often leverage materials that are referred to and utilised as 'co-design tools' (Sanders and Stappers 2012). Yet the ways materials are put to work in these encounters are often framed as being simply in service to the designed outcome or documented ideas – a positioning which does not fully acknowledge the active role played by materials which are themselves often bespoke and custom-designed for more complex ends. Through my research, I challenge the framing of co-design 'tools' to explore what other roles these material co-facilitators play and identify their implications for practice.

This practice-based research was enacted through the design and facilitation of 12 co-design workshops, with the ambition to entangle design practice with a new materialist ethico-onto-epistem-ology (Barad 2007; Braidotti 2019). Following an enthusiasm of practice, (Haseman 2006), the workshops were documented, diffracted and interrogated through a simpoetic writing technique that allowed for an intertwining of my own observations, participant feedback, and insights and inspirations from the materials themselves. These practice narratives, written with the photographs and designed artefacts from the workshops, allowed me to create situated yet speculative accounts of practice that surfaced attentions and in-tensions and provided a site for re-interpreting moments in practice through a feminist new materialist lens. The writing of these accounts revealed ways in which workshop materials can be both undervalued and over-relied upon, and allowed me to attune to different dimensions of material agency. This iterative and evolving enactment of methods informed the development of a framework which situates workshop materials as agential 'things' (Bennet 2013). Within the positioning of 'things' the framework then proposes three dimensions through which designers might consider materials' agentic potential within workshop assemblages: as tools, toys, and technologies.

Within the new materialist framing of co-design materials as 'things,' I propose an expanded conceptual framing of 'tools,' 'toys,' and 'technologies'. Examining material agency through the dimension of 'tools' allows us to recognise the utility and importance of materials in supporting the problem-orientated activities of designing. The dimension of 'toys' gently challenges a neoliberal tendency to fixate on productivity, and draws attention to the affective and experiential capabilities of the materials being used in these creative and collaborative engagements. The final dimension of 'technologies' (following Sneath et. al. 2009) considers what social imaginaries and modes of being and becoming together are enabled or constrained in these materially-mediated encounters. These three dimensions are not a definitive account of material agency, rather, they offer ways for designers to enter into new relationships with materials inspired by a new materialist ontology. In the thesis, this new theoretical framework is then put back to work through a discussion of considerations for practice catalysed by this understanding of material agency. These articulated prompts may help designers consider what they are asking of materials, and can be applied to practice in interrogative, reflective, generative, or decision-making ways. Together, the thesis offers a new conceptual framework and considerations for practice, and an expanded conceptualisation of the roles played by co-design materials, as well as a more relational practice of enacting and accounting for workshops. In suggesting considerations for practice that hold space for implicit activisms and personal realisations towards more affirmative horizons of hope (Braidotti 2019), I acknowledge response-ability to the ethical imperatives of new materialism, and offer back this understanding of material co-facilitation in a spirit of reciprocity.

KEYWORDS

Co-Design materials; Co-Design Tools; Play; Agential Realism; Feminist New Materialism

Declaration

This thesis is an original work of my research and contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signature: Alli

Print Name: Allison Edwards

Date: 19 October, 2021

Publications

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The workshops would not exist without the participants, humans and otherwise—who gifted their participation, and I learned so much from and with everyone who was generous enough to provide feedback and be part of this research.

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XYX Lab (<https://www.monash.edu/mada/research/xyx>)

Founded in 2016 under the direction of Associate Professor Nicole Kalms and the co-direction of Associate Professor Gene-Bawden, the XYX Lab “aims to understand how the gendering of space limits participation in cities and, following this, to make visible and build design knowledge in this important arena of research.” (XYX Lab Annual Report 2017). Workshops #1, #3, #4 and #8 were conducted with this lab. These workshops were vital sites for enacting this research in real-world conditions. I wish to recognise that the feedback, activity testing, and facilitation efforts from the lab members made large scale productions such as the multiple iterations of Free to Be Melbourne, and Sydney Workshop #1, the full day exhibition She City #3, and the workshop with Moreland City Council Members #8 possible and I was privileged to design and facilitate workshops in partnership with these lab members.

WonderLab (<https://www.monash.edu/mada/research/emerging-technologies-lab>)

Wonderlab is my academic home, the PhD Cohort of which I am a part and a research community that is part of the Emerging Technologies Lab at Monash University. Led by Professor Lisa Grocott, “WonderLab operates at the nexus of design, learning and play. Its research focuses on interdisciplinary collaborations that are navigated through making, storytelling, embodying and prototyping” (2019 monash.edu/mada-design). This group of researchers and PhD candidates come together in week-long intensives twice a year in a formal capacity to discuss research methods and approaches to practice, but benefit from ongoing discussions and playdates that create an academic community in playful, relational, and socially just ways. Workshops #2, #7 and #12 were supported by this lab, but the ethical approach to research and dedication to joyful and affirming academic practices developed and enacted by the lab have permeated many of the workshops as well as my approach to co-design. One of the major methodological contributions that was co-developed in this lab is discussed more in my methodology section detailing the use of Practice Narratives in 2.4.

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0.2 Welcome

You are reading about my research in an era of unprecedented and escalating emergencies. It is impossible, in our digitally connected, always switched on, and globalised lives to go through a day without hearing about or experiencing a direct effect of one or more of the catastrophes of our times. As we live through man-made climate emergencies, civil unrest and the destabilising effects of modern day colonisation, religious and political extremism, legislative attacks on the reproductive rights of women, and transgender and gender diverse people's right to exist, the increasing divide beyond rich and poor and growing distrust of the academics and experts trying to address these problems— it is easy to feel a certain weariness. Feminist philosopher Rosi Braidotti describes this as a pervasive sense of 'melancholia' and warns that it has become a dominant mood and a mode of relation (Braidotti 2009, P42). It almost seems futile to try to design in such changeable and seemingly dire times. Even within the course of this three-year, practice-based PhD the Covid 19 pandemic cancelled conferences and workshops, demanded new ways of conducting workshops and research while at a distance, and at the same time demonstrated the necessity of relational and affirming ways of designing.

It was, however, these suddenly digital, socially distanced and disruptive times that really revealed to me what was important in my own design practice and in this practice-based doctoral research. Sitting with my laptop at a bare fold out table in a locked down city and physically missing my laser cut shapes and cabinets full of print outs and recycled offcuts revealed how much these materials were not only vital to the workshops I conducted, but part of my identity as a designer and integral to my process of figuring out activities and logical progressions of workshop. Articulating what roles these materials play for me as a designer, for the participants involved in these workshops and for the broader projects these workshops are part of, revealed how much I rely upon these materials as co-facilitators in these workshops. It also threw into sharp relief how under-recognised their agency and influence in these events is.

This exegesis is my love letter to these co-design materials, and my contribution to a discipline that is rapidly evolving to be more worthy of the challenges of our times. It discusses the ontologies and epistemologies that inspired this research, and weaves together theoretical conceptualisations with detailed accounts of practice. Through this research I propose a framework for considering different dimensions of material agency that catalyses our understanding of what these co-design materials do and make possible, especially in workshops that involve diverse people and try to design as a way of creating new knowledge and addressing the complex, wicked challenges of our times, not just designing another object or concrete outcome. Informed by practice, the conceptual framework discussed in this writing draws upon new materialist theories to acknowledge material agency (Barad 2007) and to challenge the idea that humans ever think or act alone (Haraway 2016). Bringing this theoretical work back into practice, this exegesis also details considerations for practitioners who might put the framework into action and provides provocations and inspirations for anyone interested in working in more participant-centred and affirming ways with people and materials.

0.3 Reading this Document

In this document I reflect upon and contextualise the research conducted during my three years in the practice based design PhD program at Monash University in Melbourne, Australia. While Laurene Vaughan (2017) discusses the diverse and differing approaches, structures, coursework and criteria that exist for this mode of practice based doctoral research, she asserts the overall objective is enabling the transition of a designer, to a someone aware of their practice as a practitioner and ultimately someone capable of performing practitioner research and contributing new knowledge, which she describes as a 'designer-practitioner-researcher.' As such, this document positions my contribution to the field of design, articulates and reflects upon my practice and accounts for the research decisions made as I conducted this inquiry into the role of co-design materials. It is the story of becoming a designer-practitioner-researcher.

In Part One, I introduce the context of my practice and this research. I situate the evolving applications of co-design and argue that the current framing of co-design materials fails to account for the active role materials are asked to play, especially in practices that are more participant-centred and less focused on creating an object as an outcome. I then discuss how a new materialist conception of agency offers a different relationship to how we design and facilitate with these materials as active and agential co-facilitators and how this poses new questions about the role of materials, which were explored through this inquiry and the development of 12- co-design workshops. These workshops are introduced briefly in section 1.5 in enough detail to understand them as sites of practice and are further illustrated and discussed in the exhibition at alliedwards.com. The mode of writing that developed that let me analyse these workshops while sense-making with the insights from materials and inspirations from new materialist theory is also introduced in this section. Excerpts from this writing as well as additional details about the workshops are intertwined with new materialist theory in Part Two, in order to illustrate the proposed conceptual framing of co-design materials.

In Part Two I bring together new materialist theory and illustrative narrative accounts of co-design practice to propose a framework which addresses my research question and suggests a new relationship with materials. In this framework I firstly re-conceptualise co-design materials as agential 'things' and introduce new materialist theories of assemblages and agency. I then propose three dimensions designers could consider material agency; complicating current understandings of 'tools', advocating for the performative and affective potential of 'toys', and making the case for the political and future oriented acknowledgement of materials as technologies for learning and becoming.

In Part Three I discuss how this framework introduces different considerations for practice, and how this lets designers appreciate the active role of materials while not asking too much of them. I conclude by discussing the implications of this research for both theory and practice, and discuss the limitations and future directions for research like this.

In the Exhibition

The publicly accessible exhibition documents the practice conducted during this research and is available at alliedwards.com. This website includes a short overview of my research, more discussion of considerations for practice proposed through this research, and more in-depth documentation of the 12 workshops that were developed for this research. My proposed conceptual framework is also activated through the 'exhibition opening' taking place online, where guests are invited to engage with the framework. This online activity Miro will be documented and available to watch, and the framework will remain open for visitors to engage with after the opening event until this work has been examined and submitted.

Part One

1. Introducing my Research

In this thesis, I draw upon theories from feminist new materialism to better articulate dimensions of material agency that are emerging in co-design literature and that were becoming legible through my co-design practice. To introduce this research, I first establish the increasingly complex and socially concerned applications of co-design and introduce my own participant-centred practice. I then discuss some ways co-design literature currently conceptualises the materials used in co-design workshops, and suggest ways in which we might more fully attend to the ways in which materials and participants are both performing in these co-creative sessions. Bringing in theories from feminist new materialism, I illustrate how these open up a new mode of relating to materials and I describe how these theories entangled with my own design practice, challenged my understandings of material agency, and ultimately inspired my research inquiry into the role of co-design materials.

1.1 Co-design

Co-design and social innovation

Even before the Covid 19 pandemic and sudden switch to online and distanced workshops, as mentioned in the preface of this thesis, design was experiencing growth pains. The discipline was maturing, moving from designing communications and products, to Richard Buchanan's (2001) fourth-order of design as 'social-change-oriented-systems interventions'. In light of more socially-oriented practices and the increasing recognition of the political power of design (Costanza-Chock 2018), practices and criticism of design are evolving and calling into question definitions and expectations for design that are focused too much on the outcome of the process. Take for instance, Herbert Simon's (1982) often cited and once applauded assertion that design is "devising courses of action aimed at changing existing situations into preferred ones," which now raises the questions, 'preferred for whom?' and 'at what expense to people and the planet?'

These questions are increasingly important to ask with the increased demand for more socially equitable practices (Costanza-Chock 2018), relational ontologies (Willis 2006), and a view of designing 'worlds where many worlds fit' (Escobar 2019). Ideas of social accountability are not new to the field of participatory design, a methodology for involving users in the design development process which came into being in the context of the workers rights movements in Scandinavian countries in the 1970 (Sanders & Stappers 2008). Participatory design recognises the value of lived experience, and seeks to bring together diverse people with different skills and knowledges in order to inform a design outcome. One way this is achieved is through acts of co-designing, bringing together people and materials to make, discuss, and prototype ideas. In this process the 'expert' role of the designers shifts from being in charge of making the outcome, to supporting the creativity of designers and "people not trained in design" to be able to work together in the design development process (Sanders and Stappers 2012, p3).

In Mattelmäki and Sleeswijk Visser (2011) literature review of the way co-design is discussed, they identify several common themes. Co-design is commonly used to describe a general process or tool for collaborative engagement; to signal the involvement of designers and users when exploring, envisioning and developing solutions; and to mean some sort of engagement of potential users and stakeholders in collaboration (ibid). Especially now, due to the increase in popularity of creative approaches such as co-design and design thinking, (Sanders & Stappers 2012; Aguirre et al. 2017; McKercher 2020), co-design as a term is applied in broad ways and often conflated with any act of involving stakeholders, or applications of creativity and design,

such as co-creating visual and physical artefacts, generating knowledge based upon lived experience and professional expertise, or going through a design thinking process in order to better understand and solve problems. However, it always involves some sort of co-design materials, ranging from off-the-shelf supplies like pens and post-its, to more elaborate and bespoke co-design tools that are specially created for this purpose. (Sanders & Stappers 2014; Aguirre et al. 2017).

As co-design practises evolve and increasingly become concerned with ways of sharing power and strengthening self-determination (Agid 2019) as well as offering opportunities for people to grow their skills and relationships (McKercher 2020), the practises and enactment of co-design is shifting away from just being concerned with designing the end product. Co-design is increasingly heralded as a way to not only create more responsive and appropriate solutions, but to better understand the problems and address their root causes and the issues they raise (Blomcamp, 2018; McKercher, 2020). Co-design is also acknowledged for its political and empowering potential, as it is capable of “giving voice and tools to those who are not usually involved in a design process” (Akama and Prendiville 2012. P30). In fact, as awareness about the potential benefits and even therapeutic potential of co-design becomes evident (Hirsch 2020) there is even more of a duty of care to attend to the experience of those we are working with. As the issues at stake become more socially-oriented and the communities involved become increasingly diverse, the design of and facilitation of these experiences becomes more complex (Light and Akama 2012). I argue that this calls for a more nuanced understanding of how both people and materials are participating in these engagements.

Accounting for facilitation and participation

As co-design transitions from a democratic approach for designing objects, to taking on complex social issues and democratic innovation (Björgvinsson, Ehn and Hilgren 2010) we can see a shift in value and attention from the qualities of the object being made to the political and ethical ramifications of the process of coming together and the act of making itself (Light and Akama 2012). When design is used to achieve socially recognized goals in new, innovative, and sustainable ways (Manzini 2014), the process of designing becomes necessarily more improvisatory and performative. Akama, Pink and Sumartojo (2018, p. 10) call for design scholarship to align towards this understanding of futures as “ongoingly emergent, contingent and indeterminate.” Within this broadened version of what design does and creates, opportunities emerge for practitioners to evolve their practices to be more accountable and ethically aligned. Tonkinwise (2017, p. 2) argues that this more socially innovative practice requires new forms of social research, different accounts of creative cognition, and new modes of communication. It is no longer enough to discuss what was made or decided upon; rather, the process, conditions and acts of participation need to be better accounted for.

Yet, reviewing accounts of co-design workshops in academic articles, Bowen et. al. (2013) discovered that most accounts of co-design workshops and practices focus “solely in terms of qualities of the resultant systems without attention to participants' own experiences, sense of agency and capabilities” (Bowen et. al. 2013, p. 231). Analysing the materially-rich and processual experience of a co-design workshop in this way flattens a dynamic and emergent event into a more linear procedure, in what Donald Schon describes as historical revisionism, “reading back onto the beginning of this process what emerges only at its end” (1992, p. 132). Workshop accounts and discussions that flatten the process in this outcome-oriented way are often “written to promote how co-designing enabled transformation rather than to reveal and understand the conditions that enabled this to emerge” (Akama 201, p. 272). This can come at the expense of the people involved and can perpetuate an extractive relationship with participants (Costanza-Chock, 2020). This emphasis on the outcomes risks missing out on the potential benefits of co-designing when done from a position which foregrounds an ethics of care, such as the socially impactful approaches advocated for by McKercher (2020). Additionally, I argue that accounts that overly privilege the importance of human cognition and problem solving come at the expense of recognising other more subtle things that are becoming possible and being experienced by participants. More importantly, it ignores the active participation and even co-facilitation role of materials within these engagements, which is the focus on my research.

My Co-Design Practice

Amidst the move away from expert designers making decisions on behalf of people, I embraced the role of a facilitator, using design expertise to invite other people into decision making processes by making complex or abstract things visible, tangible and able to be discussed and re-modeled. As I designed increasingly experiential and elaborate activities and materials to engage and delight participants and to contribute to imaginative problem solving, I started thinking of my own practice as 'participant-centred.' Instead of focusing on the outcome being produced, I was invested in creating opportunities to engage with complex issues in creative and imaginative ways, which also resulted in valuable insights and realisations or new relationships for the participants involved in these workshops. Finding opportunities to work aligned with personal values, I privileged opportunities for engaging with complex issues in affirmative ways, and I considered the materially rich, playful and engaging ways into problem solving and creation integral to my practice, and part of what I offered as a designer in this space.

However, while I was surrendering my decision making power in a formal capacity, the materials I was designing or selecting were still enforcing or precluding certain conversations, considerations and possibilities from becoming in these engagements. While I was trying to downplay my own role as supporting and enabling participants' decision making, I started wondering if the materials I was designing were not just helpful and engaging, but another form of exerting designerly control and dominance over the open and exploratory processes I was advocating for. This is why instead of classifying materials by the way they assist different roles the human facilitators performs (Agger Erickson 2012), or even by their level of complexity and potential experiential ability (Aguirre et al. 2017), this research positions materials as 'co-facilitators.' This move helped me keep sight of not only the ways they were helping me (such as in Erickson's 2012 discussion of staging), but also the ways that the material's agency conflicted or overpowered my own power as a facilitator.

In this research, I am interested in the materials that are used in these acts of collaborative creativity. While some co-design processes are ongoing, and invite participants throughout the entire design development process, this research looks at specific moments of engagement between people and materials in the act of co-creating and designing. The 12 workshops that I designed and facilitated as part of this research are one-time events, that ranged in duration between one to six hours, and were conducted with a wide range of participants within different contexts. These workshops all used some form of physical material to enable a process of making, discussing, and learning. Some of the workshops used design thinking as a structure to guide participants as they designed solutions and outcomes¹. Some of the workshops were designed to be more educational, using prototyping and visual activities to surface knowledge and discover more about the problems and topics being explored, or apply new learnings. A few of the workshops discussed in this work were specifically intended to explore the use of different materials, and were more co-creative in nature, as they used open and exploratory approaches to making with materials, rather than trying to design a real world outcome. These workshops as well as the partners I worked with are introduced in 1.5 'Sites of Practice' and are discussed in relation to new materialist theory in order to articulate my framework in Part Two, as well as detailed further in my online exhibition. What all of the workshops had in common was that rather than gaining insights into how to better design an outcome they were using the *act* of designing itself as a means of social innovation and tackling the challenges of our times, and they asked more of the materials than is typically acknowledged in co-design literature, where they are currently framed as tools.

¹ Design thinking is not the main study of this research so I am not delving into the differences between the commercialised and linear IDEO approach, compared to higher level designerly thinking and approaches called for by Findeli (2001). For more on the distinctions between design thinking see Tuckwell (2017).

1.2 Co-Design Materials

As many practitioners will have experienced and as academic design literature is starting to explore, materials play a more active and influential role in co-design workshops than just problem solving and making ideas visible. In this section I discuss the commonly acknowledged roles co-design materials play as cognitive tools and tools for facilitation, as well as some more experiential and emergent qualities that are increasingly being attended to but in need of further study. I will then, in the next section, 'A theory is chasing me,' introduce ideas about material agency drawn from feminist new materialism, and describe how this philosophy helped me further articulate the dimensions of material agency beyond an instrumentalised view of 'tools.'

Resourcing and Planning

In order to engage people who are not trained in design and encourage creative collaboration, designers usually set the stage using visually rich and experiential activities and tools that enable collaborators to participate and contribute to the process (e.g. Sanders and Stappers 2008; 2012). These physical materials could be as generic as paper (or post-its notes) and pencil, as open ended as craft materials, or could be purposely selected or even designed from scratch to suit the specific participants and projects in a particular workshop. These materials that are purposefully selected or designed are often referred to as "co-design tools," building upon extensive literature from Sanders and Stappers, who are considered experts in the field. Despite some frameworks for decision making in co-design including materiality as in afterthought and subservient element (Lee et.al. 2018), such co-design tools are frequently described as a key characteristic of such workshops (Ehn, 1988; Simonsen 2012; Heimdal and Rosenqvist 2012; Sanders and Stappers 2012; 2014). Selecting or designing these materials is often based upon design experience and consideration of what the materials might make intelligible to the design team and might evoke for participants (Sanders and Stappers 2012).

Ylirisku et. al (2016) describe this negotiation about what to make available in these sessions as "resourcing," and progress the discussion of these materials beyond viewing the tools as static and predictable objects. They discuss how the meaning and value of these materials is created collectively and caution that, "materials prepared for an event may not come into play as expected, and conversations around them may shift in ways not anticipated" (2016, p. 2). This is, they suggest, because whether something will become used as a resource is shaped by those relating to it, as the groups negotiate not only what they are creating but how they are creating as well. Understanding that participant's usage of materials is open to interpretation is important in setting up how these materials are used and what they might be enabling in workshops. Scandinavian design traditions often emphasise the importance of this early work by using the metaphor of staging, describing the role of a designer to set the stage through scripts and invitations, and to prepare and arrange activities for multiple actors (Pedersen (2020), and as Agger Eriksen (2012) has pointed out, non human actors as well.

In this research, while I agree with Yee's (2014) assessment that designers develop knowledge and sensitise themselves to potential solutions during the design and planning of the workshop, (p. 54) I am more interested in better explaining what happens when materials are enlivened in the workshop itself, and how designers might conceptualise this material agency beyond the prevalent understanding of materials as cognitive or facilitation tools.

Co-Design Tools

These material components (often called 'tools') and the ways in which the tool is put into action (techniques) (Sanders and Stapper 2012), come from a rich tradition of designerly ways of making knowledge visible and tangible. This approach draws upon the evocative potential of design probes (Gaver et al. 1999; Mattelmäki 2008), which use rich and varied materials such as maps, photography and cards to elicit information from potential users that inspires the design team. It also utilises modes of making like building models and prototyping that create knowledge about "where lived life meets imagined artefact; where people's bodily

comportment, social relations, cultural preferences, and technological ability can be projected onto a moldable object of desire” (Halse et al 2010, p. 14).

A range of materials are employed in design; from commonly used materials like post-it notes and sets of prototyping materials to generate ideas (Sanders and Stappers 2012), to the selection of preexisting objects as playful triggers, (Loi 2005; Akama et. al. 2007), or custom made, bespoke visual probes and design games as tools for designers to organise dialogue, support understanding and gain contributions (Sleeswijk Visser 2009; Vaajakallio & Mattelmäki 2014). These more evolved materials that are empathetically designed are sometimes described as “generative, sensitive, visual and playful tools” (Mattelmäki 2008). Even when addressing creative and empathetic objectives, these material tools are often categorised by the cognitive function they are considered to support or enable, such as Sanders and Stappers’ framework for the use of co-design tools, (2010; 2012; 2014) building upon their categorisations of say, do, and make.

Technique	Tools
(Say) Talking, telling, and explaining	Diaries/daily logs, cards with different stimuli or concepts (also known as evocative image cards)
(Do) Acting, enacting, and playing	Game boards, pieces, and rules; props for envisioning, improvisation, skits and plays
(Make) Making tangible things,	2-D paper collages and 2-D mappings; 3-D mock-ups

Figure 2. Summarised table of Sanders and Stappers Framework (2012) tools and techniques

Cognitive Tools

In Sanders and Stappers’ (2012) discussion of co-design approaches and their framework for organising materials (see Figure 2, above), the way designers enact the technique is acknowledged, and the way different techniques in relation to different tools can help non designers surface tacit knowledge and make ideas visible is championed. Even in conversations seeking to understand how designers don’t just enact methods but are always adapting and iterating as they use the visual, tactile and creative components to “help users project their experiences and envision their desired futures” (Lee 2014), we can see a focus on responding to how the materials help make ideas visible and think through problems. For example, in Agger Eriksons’ (2012) research she finds that while materials may be pre-determined and invited for a particular reason, “stakeholders add negotiated meaning to them” (p. 365). In many accounts of co-design such as this, there is attention to how important the materials are as a functional tool to aid discussion, negotiation of meaning, and thinking. However, understandings of agency are reserved for human participants, leaving the ways in which materials are actively participating or suggesting their own meanings to participants less examined. While this material making is valued as central to the co-design process, the value is placed on how outcomes translate to inform the designed outcome (Sanders and Stappers 2012).

This framing of tools, with an emphasis on how materials are used to externalise ideas and enable people to think and discuss is common throughout the literature, even by designers who champion this approach and attend to what this mode of making enables. Grocott (2017) discusses the strengths of designing as making visible, enabling reflection and learning. The materials used to do this could be simple paper and pencil, or more generative tool kits such as those discussed above. Katić, Hmelo-Silver, and Weber (2009, p. 3) label these materials by their role in making ideas visible, framing them as “material mediational tools” which “allow

difficult and elaborate reasoning tasks to be distributed into the physical environment.” This externalisation through materials is recognized for helping participants document and make ideas visible, therefore better articulating and documenting what was discussed (Bruner 1996). It is also appreciated that the spatial qualities of externalising ideas in this way afford opportunities to interrogate and examine mental models and metaphors (Ricketts and Lockton 2019). Throughout examples in the literature it is common to see the materials’ role framed as helping participants problem solve and think, as well as aiding discussion and group work. As demonstrated by Dindler and Iversen (2007), even in narrative based approaches, the materials can evoke ideas and help stage events and scenarios. Privileging how people think with materials is consistent in Olesen’s (2020) discussion of ‘Co-designing a co-design tool to strengthen ideation’, where the tools developed helped support discussion on different levels towards fleshed-out thinking. This tendency to frame materials as cognitive tools is even true for accounts of playful materials, and design games (Vaajakallio & Mattelmäki 2014). In the most comprehensive analysis of card decks, Roy & Warren (2019) describe these potentially playful and experiential materials as tools and classify them based upon creative thinking, futures thinking, and team building.

Beyond just “adding a tool to the facilitator’s toolbox” when they design for social good (Tan 2007), I argue that the materials used in these co-design engagements not only improve problem solving and collaborative capacities, but make different ways of being open to ideas, relationships with others, and even different possibilities possible. Akama et. al (2007) have pointed out the ways in which the use of artefacts can elicit information about relationships and processes that was otherwise left out. Building upon Loi’s (2005) discussion of ‘playful triggers’, and the ability of these premade plastic animals and figures to ‘generate receptive modes’ and shared understandings, they describe how these objects enabled participants to articulate and discuss more complex relations and processes that were influencing collaborative projects. In their discussion of these materials they start to illustrate other roles the materials play, beyond cognitive tools. They discuss how having objects to select from can overcome the intimidation of a blank page, how presenting models comforted participants, and how the objects acted as avatars and created distance between the actual people being discussed and the figures being discussed. In this account, a more nuanced story of how materials helped participants solve problems becomes clear. Some of the collaborative and experiential aspects of the activities are discussed, expanding considerations beyond just how people thought, to include the social and emotional aspects of the experience as well. However, the way in which participants used the materials is still the emphasis of this discussion - even in a discussion that acknowledges the importance of these materials, the ways in which the selected materials might have enabled or constrained certain topics and ultimately contributed to different possibilities is left unexamined.

This framing of materials as tools to help participants think and communicate makes sense when the objective of a co-design workshop is to inform the design of a specific thing, or to inform the design process. But as co-design is applied in a social innovation and equity context, there is more at stake and these engagement and visioning workshops need to become accountable to more than commercial practices (Mckercher 2020). Being explicit about decision making processes within workshops and ensuring that the diverse people invited are psychologically safe and comfortable participating and sharing their ideas becomes increasingly important. Since designers who are asked to facilitate these events are often not explicitly trained in facilitation, the materials that designers create and bring with them to these engagements are an asset, and can be framed as facilitation tools.

Facilitation Tools

As the co-design tools and techniques mentioned above are not only employed to “support, and provoke creative thinking” (Sanders 2012, p. 56), but also to help the designer facilitate the experience, different frameworks for considering the design of co-design materials and considering what role the materials played are necessary. Aguirre, Agudelo & Romm (2017) make progress by proposing criteria for evaluating materials used and considering the “holistic orchestration of participants in time and space” (Aguirre et al. 2017). Their framework starts with foundations they call core facilitation, which they label as participatory (enabling participation), intentional (clear purpose), and functional (considering usability and logistics). Once these core

conditions have been met, the facilitation tools can be evaluated based upon the three criteria they propose, evaluating the way in which the materials inspire creativity; create an immersive, sensory experience; and prompt empathetic and human centred insights (ibid 203). Aguirre, Agudelo & Romm's evaluative framework is intended to "advance designers' understanding of design facilitation practice" (207), yet the way designers worked with and facilitated with these materials is left unaccounted for, as is the active role played by the materials themselves. While this framework progresses arguments for attending to the human participants' experiences, it was created and evaluated by observing workshops and interviewing other designers. Even frameworks such as this one that pay attention to the materials, analyse how participants used the materials, and focus on how the material and activities were structured to take people through a problem solving process. This precludes attending to the variety of roles that materials are playing simultaneously, and how they enable or constrain acts of facilitation and the possibilities that are emerging during interaction between people and materials in a workshop. Extending Light and Akama's (2012) assertions that practitioners need to be more aware and transparent about their own enactment of facilitation techniques and methods in design, I argue that the role of materials in this process is necessary to attend to, especially as co-design practises evolve to be more socially engaged and these materials are relied upon to help facilitate in experiential, creative and active ways.

Expanding the Notion of 'Participants'

In many of these discussions from co-design literature about the roles materials play, co-design materials are framed as tools, with a predetermined, cognitively beneficial use. Their impact in the workshop is limited to how they were used by people to get to the outcome, and they are positioned as neutral mediators (Lahti 2016). However, as I will argue, this not only downplays the active participation of materials but the range of ways people are engaging, affecting outcomes and emotionally being affected themselves. Categorisation of materials by the mode of thinking enabled, such as Sanders and Stappers' (2012) framework, artificially divides the way people work, communicate, and create together. Much of this discussion draws upon Gibson's theory of affordances, which is a fundamental concept for discussing how objects are designed and used in design. Leach analyses Gibson's theory of affordances, and concludes that while there is a particular set of actions 'afforded' by a tool or object, "[i]t is not that the tool or object has agency as such, or the capacity to 'invite' or 'prevent' certain actions. Rather, it merely 'affords' certain operations that it is incumbent on the user to recognise, dependent on pre-existing associations with that tool or object" (Gibson cited in Leach 2016, p. 347). This way of thinking frames matter as passive, at the mercy of first a designer and then a user to inscribe meaning and dictate what becomes possible. This framing is useful for considering how people use materials but, I would argue, is less useful in understanding how the materials make possible different modes of imagination and ways of being together in a workshop space.

Binder et al. (2011) describe social creativity and designerly modes of thinking as not just for individuals, but groups of minds using artefacts and tools in a collaborative process. What if the materials that were part of this process were considered as active participants in this process? While discussions of what materials make possible and the influence on outcomes are common in discussions of artistic practices (Ingold 2010) as well as discussions of how designers and students of design think visually with materials (Heimdal and Rosenqvist 2012; Lahti et. al. 2016), the discussion of materials in this more active way seems to be reserved for contexts where the people are trained in visual disciplines. The pride at being human centred seems to limit accounts of co-design, over simplifying the role materials play in this collaborative process.

In my own practice I witnessed the ways in which the materials transformed the energy of people walking into the decoratively staged room and how bespoke elements elicited excitement and warranted taking photos to send to colleagues and post on instagram. I saw how the introduction of new materials influenced conversations and made different metaphors and visualisations possible, even different outcomes. Yet in the discussion of co-design literature I felt materials were both under-valued in their instrumentalisation as tools, and were often over relied upon to perform - as designers described their ability to encourage dialogue and improve cognition as inherent properties, without consideration for what was enabling both people and

materials to participate in certain ways. Taking up this line of inquiry into the role of materials, I sought a theoretical lens that would let me re-frame their role into something more active and agential.

1.3 “A theory is chasing me!”

As Alecia Jackson and Lisa Mazzei (2020) humorously argue, there can be a sense of pursuit in doing the work of inquiry. Sometimes this looks like searching for the right theory or searching for ways to bring a theory to a project in ways that are ‘undisciplined’ and allow an opening up of knowledge rather than foreclosure along disciplinary or methodological lines (Jackson & Mazzei 2012). They illustrate how this thinking with theory produces not only a different encounter with data, allowing them to think differently but also allows them to, “interrogate our own positioning and intra-actions as researchers” (ibid viii). In the case of this doctoral research it was more akin to having a theory chasing me. As I sought an explanation for the way I felt materials were actively participating, I found resonances and productive dissonances in feminist new materialist accounts of material agency. Once encountered, they would not leave me alone. They spoke to my experiences as a designer and my relation to the materials I co-facilitated workshops with more than the frameworks from co-design literature. As I sought to understand this entirely different way of constructing reality and creating knowledge, these theories acted back upon me, changing my research question from trying to further classify and define how people are using materials in a co-design workshop, to a question of what materials themselves are making possible and how designers might design with this material agency in mind. These theories are discussed next.

(Feminist) New Materialism(s)

Before launching into an introduction to new materialism and explaining the re-orientation of this project that it encouraged, it is important to acknowledge resonances and the lineage of Indigenous ways of knowing that pre-date and inform new materialist thinking. The separation of mind/body, nature/culture that new materialism challenges is steeped in western schools of thought, and many relational and materialist ontologies have benefited from the wisdom of Indigenous thinkers and scholars. However, while paying respect to this rich cultural tradition I heed the warning offered by Ahenakew (2016) “to be wary of transplanting ways of knowing and being from a context where they emerge naturally to a context where they are artificially implanted” (Ahenakew 2016 cited in Mazzei 2021, p. 323). This research did not directly or consistently engage with Indigenous ways of knowing, so with acknowledgement and gratitude I continue working within feminist new materialism(s), which encompasses multiple emerging approaches in the ‘(s).’ In this I include scholars who take a view of materiality as active and agential, but importantly, who ask what this *does* and ask how this ‘mattering matters’ in questions of equity, justice, and sustainability – as Donna Haraway poses:

It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what descriptions describe descriptions, what ties tie ties. It matters what stories make worlds, what worlds make stories.” (2016, p. 12)

In this pursuit, my research aligns more with Karen Barad’s (2007) framing of an “ethico-onto-epistem-ology” (185) in which there are always ethical concerns in what can be known and how, and no such thing as a neutral knower or production of knowledge. This interrelatedness between “ethics, knowing, and being” is fundamental to the agential realist approach set forward by Barad (2007) which resonates and is re-worked in different ways by the many scholars under the loose umbrella of feminist new materialialism(s), and in the theories of material agency that catalysed this reconceptualisation of co-design tools.

In Barad’s writing on the non-human aspects of agency, they assert that agency is not an attribute of something or someone but results from intra-active enactments between elements that are co-constituting. “Agency is ‘doing’ or ‘being’ in its intra-activity. It is the enactment of iterative changes to particular practices – intra-active reconfiguring of topological manifolds of spacetime-matter relations – through the dynamics of

intra-activity." (2007, p. 178). While Barad, with their background in quantum physics, is speaking here to the nature of reality itself, this was exciting, though challenging, to apply on a smaller scale to the role of materials in co-design workshops. It meant that materials in and of themselves did not have static roles, or even affordances as typically thought about in design.

Working with a new materialist understanding reoriented my thinking around what bodies can 'do' and how matter 'acts' (Fullagar 2017). In this view agency is "not an inherent property of an individual or human to be exercised, but [a] dynamism of forces" (Barad 2007, p. 141). Accordingly, materials gain agency in relation to the other elements they are not only acting with, but co-constituting. Because these elements are co-constituting, it means they can't be considered as entities on their own, and don't have inherent properties². Objects became co-design materials, just as people became participants in relation to each other. What is made possible in this becoming is much less pre-determined than one might be led to believe with the current discussion of co-design "tools," or taxonomies of the activities done with certain materials (Sanders and Brandt 2010).

In viewing the agentic potential of co-design materials in this way, it becomes necessary to look at how they are acting within workshops assemblages³. In these assemblages, the whole becomes more than the sum of its parts, irreducible to distinct elements and flattened in the sense that "no one materiality or type of material has sufficient competence to determine consistently the trajectory or impact of the group" (Bennett 2010, p. 24). Looking at workshops as socio-material assemblages (in which theory, language, ideas, forces such as emotions and pre-cognitive affect are included in this definition of material), the intentionality of the human as a cognitive and rational subject is de-centered. This reveals a wider range of intra-actions that grants agency and vibrancy (Bennet 2010) to matter, and allows a re-imagining of what these materials are making possible. While I initially planned to use this notion of material agency and attention to assemblages as a lens through which to view the role of materials, the imminent and lively theories of new materialism refused to stay put or be contained. In navigating between design and new materialism, I found myself and my research entangled.

Entanglements

The process of thinking, making, and framing a research question with these theories, might best be described as entanglement. Entangled as in the sense of a meshwork of interwoven lines of growth and movement (Ingold 2010) which makes something new and has an ongoing unfolding nature. Entangled as in the sense that this intra-activity offers not only new production of knowledge, but through the encounter creates new potentialities for the assembled theories, practises, participants (human and material) and research(ers). While this doctoral research is situated in an Australian university design department, is practice based and engages with scholarship around co-design tools; this project is as much a result of the spaces opened up by new concepts and the momentum gained in the mutual pursuit of theories that account for material agency.

Lastly, this research is entangled with my own positionality as a white, able-bodied, middle class, English speaking, queer, cis-gendered woman who is an immigrant settler on unceded Indigenous lands. In taking a feminist approach to this research I follow Haraway in refusing the "god trick" of seeing everything from nowhere, and am instead accountable and situated as a "complex, contradictory, structuring, and structured body" (1988, p. 581). This move makes me, these ways of knowing, and this research entangled in the more quantum sense Barad describes as "ethico-onto-epistem-ology" (2007, p. 185), since the knower, 'the-world-that-is-to-be-known', and knowledge producing processes are all entangled. Within this

² This is the biggest difference between Actor Network Theory (ANT) and Barad's agential realism. While ANT examines networks of distinct entities and how they interact, Barad proposes that the ability to act comes from within the relationship as a phenomenon.

³ Barad clarifies that apparatuses are not merely assemblages but "specific material reconfigurings of the world that do not merely emerge in time but iteratively reconfigure space- time-matter" (2007, p. 142). I follow a more Deleuzo-Guattarian approach in using assemblages, as the concept serves to examine what materials were doing in the intimate scale of a workshop, with less emphasis on what the larger workshop as an apparatus was doing/mattering.

entanglement each intra-action matters, “since the possibilities for what the world may become call out in the pause that precedes each breath before a moment comes into being and the world is remade again, because the becoming of the world is a deeply ethical matter” (Ibid).

The larger accountabilities this ethico-onto-epistem-ology introduces became central to this project and informed the methodological moves made in unexpected ways (discussed in section 2.3). This entanglement with the ‘theory that chased me’ also informed the framing of the research question that emerged from and was interrogated through practice.

1.4 Research Question

My research addresses the question “How can the role of co-design tools be reframed when entangled with Feminist new materialist theories?”

The aim behind this question is to add nuance to the growing discussion of how materials play active roles in workshops and to propose several frames through which designers might consider how materials are actively participating. Rather than examining the intent of the designer and the use of materials before, during, and after workshops to describe roles in staging and formatting, as Agger Eriksens’ 2012 doctoral research did, my research seeks to articulate dimensions of material agency that are enabled and enacted in the workshop assemblage itself. I specifically expand upon current conceptions of what materials are doing by drawing upon new materialist theories. To navigate this departure from my disciplinary ways of knowing, while maintaining relevance and working towards a contribution of knowledge to design, I asked two sub questions and used the negotiation between them to drive this research. Asking “How does feminist new materialism enable different ways of thinking about materials?” fed my curiosity and created a sense of exploration that opened up new ways of conceptualising material agency. Asking “What considerations does this make possible for co-design workshops?” was a way to keep applying these theories to practice and maintain a designerly orientation to this work. These questions are answered through the creation of a conceptual framework that enables designers to engage with ideas about material agency through the lens of a new materialist ethico-onto-epistem-ology that suggests considerations for practice that are enabled by this more relational approach to designing and facilitating with materials.

Asking my Way to the Right Questions

The act of posing a question does work, performing what Barad (2007) describes as a sort of agential cut, an imposed distinction which enables certain thoughts and actions. I initially started this research asking “What roles do co-design materials play?” Only to discover that this question was ontologically incompatible with the new materialist theory that was driving the work, since it assumes a static role or description of agency that can be prescribed independent of context. As Barad reminds us, “relata do not precede relations” (2007, p. 334). This was, in fact, the issue I was experiencing with accounts of co-design practice that instrumentalized the use of materials, implying that certain responses were a given and ignoring the factors and forces that enabled certain performances both from people and materials. Conversely, attempts to attend to the liveliness and agency of materials without the practical grounding of what people were doing with materials in the workshop resulted in the sort of anthropocentric imaginings that, while provocative, did nothing to further co-design practice or contribute new knowledge. This tension was resolved through asking the sub question: “How does feminist new materialism enable different ways of thinking about materials?”

Following this line of inquiry involved leaving the familiar design books about convivial toolboxes and co-design, to go visiting (Haraway 2015) within the new materialist world of literature and theory that, while different and at times difficult, somehow resonated and spoke to aspects of practice I had experienced but hadn’t yet made sense of. These were ways of knowing I had perhaps felt, but never heard spoken and ways of being I had desired but never seen theorised in an academic context. This process of entangling new materialism theory and design practice created the conditions of possibility for this question, and also created the types of doubts and insecurities that might be anticipated when coming from an undergraduate and masters degree in design - a discipline that uses language to dig deeper into what humans are doing in order

to make materials for them; and finding myself instead being pulled to a way of asking questions that invokes materiality to look beyond what is human, and also asks what is possible. To balance the tendency to get lost in the literature as I chased after theories to think with, I maintained an orientation towards design practice by asking the second steering question, “What considerations does this reframing make possible for co-design workshops?” These questions enabled me to think with theory (St Pierre & Jackson 2014) while progressing research through my practice.

This practice-based component took place through the design and facilitation of 12-co-design workshops which are discussed next, concluding this chapter about my practice. The methodological bricolage that emerged with the doing of these workshops and the methodological innovations that allowed me to answer these questions, are then discussed in Chapter Two.

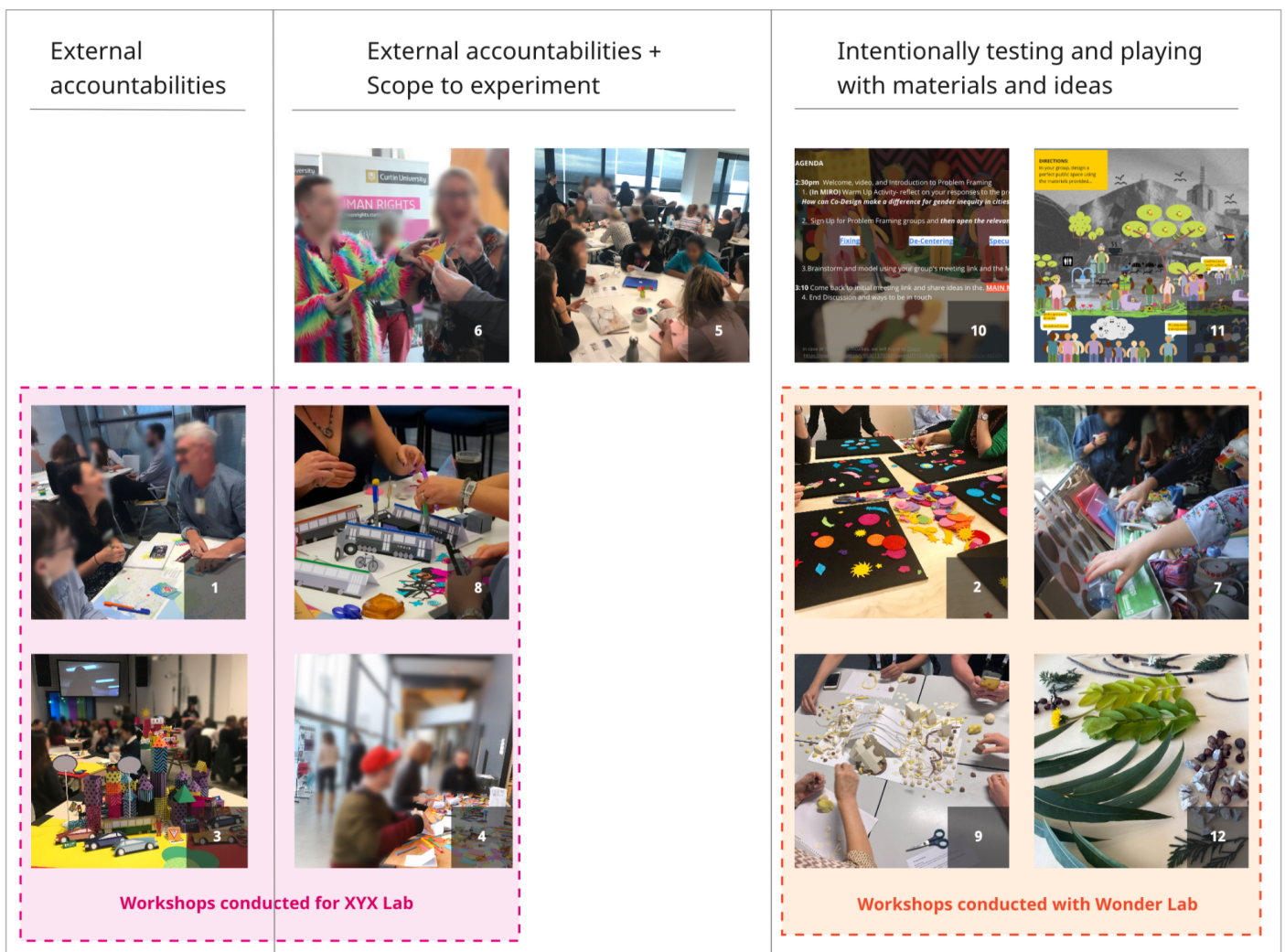
1.5 Sites of Practice

The practice component in this PhD consisted of the design and facilitation of 12 co-design workshops. These can be classified as belonging to one of three different categories.

- 1) Workshops with external partners where I was accountable to an outcome that was driving the workshop development. These still progressed understandings for my project but offered less scope for experimentation and limited opportunities to ask participants about their experience. Participant insights usually were sought using short surveys and paying attention to comments participants would make, but with no further questioning in the moment. (1, 3)
- 2) Workshops with partners where there were external objectives but also opportunities to experiment with materials. In these engagements I was able to talk to participants about their experiences in more depth in the moment, such as picking up on a comment and asking “why do you think that is?” or “do you think there is something about these materials that helped you do that?” (4, 5, 6, 8). I was also able to follow up with volunteers through correspondence after the workshop.
- 3) Workshops designed primarily to play with and test ideas about the role(s) materials were playing and elicit input and insights from other academics and creative practitioners. These workshops were for conferences and events like Melbourne Design Week, and both the activities and end discussions interrogated different views and insights into the role of materials (2, 7, 9, 10, 11, 12).

The way the workshops fit into these categories is pictured below, and each workshop is outlined. More detail for the use of materials in each workshop is available at the exhibition, www.alliedwards.com/sites-of-practice

Figure 3 Three different situations of practice.



1 Free to Be Sydney: Crowd-mapping App Co-Design Workshop

March 9 2018

Link: <https://www.plan.org.au/you-can-help/join-the-movement-for-girls-rights/free-to-be/>

Summary:

This full-day workshop hosted by Monash University's XYX Lab under the direction of Nicole Kalms, brought together 24 attendees including academic researchers from XYX Lab; ARUP Global Advisory, Design, Planning & Engineering; app developers from Crowdspot; and youth advocates from Plan International. Building upon the previous Free to Be App that was initially developed by Crowdspot and Plan International and deployed in Melbourne in 2015, this workshop had several objectives. 1) Reveal similarities and differences between what academic researchers need to know and what young women feel like sharing about negative or positive incidents in public space. 2) Inform the re-design of Free to Be App to better suit the needs of young women, and collect the most important information needed for policy change and research.

**Overview of workshop activities and materials**

1) Acknowledgment of Country, brief introduction to the day, the XYX Lab and established participants as experts of their lived experience, Industry professionals with professional expertise, and gauged familiarity with Sydney.

2) XYX Lab research, as well as outcomes from Free to Be Melbourne, were presented by Nicole Kalms and Zoe Condliffe to set the objective then design thinking was presented as a way to problem solve and prototype and test ideas.

3) Youth and researchers filled out bespoke booklets that elicited a positive and negative story, and which made visible the type of information was discussed.

4) Table groups of youth and groups of professionals prioritised the type of data they would want to share or need to collect. The two groups of youth and the two groups of professionals created a final version on the whiteboard.

6) The similarities and differences between the groups' cards were discussed, using sticker voting to select the most important types of information and negotiating what would be sensitive or uncomfortable to share, why researchers might need, and what youth would prefer to be optional or asked a certain way.

7) After a lunch break, youth and industry professionals were mixed in new table groups then played a specially designed game about sharing information about Sydney. This game familiarised them with each other, as well as introduced different ways of pinning, drawing, and engaging with a map of Sydney, which was the premise of the app.

8) Each of the groups prototyped a version of the app that would collect the information that was voted highest priority.

9) Groups presented to each other and filled out feedback cards about what they liked/disliked about each other's apps.

After the workshop

Return report including descriptions of each app idea and results from the activities. XYX Lab consulted with Crowdspot to development the final app based upon findings. The app was launched by Plan International for use in Sydney, and adapted with local partners to make it culturally relevant, and roll it out in Kampala, Lima, Madrid and Delhi.

For my Research

This workshop tested ways of materially scaffolding thinking without overly constraining. It also confirmed the importance of attending to social and experiential needs, and the value of and visual ways of surfacing and holding space for conflicting needs between different stakeholder groups.

Figure 4. Workshop #1

More information at the exhibition: <https://www.alliedwards.com/f2bsyd>

2 Research Space. WonderLab PlayDate Melbourne Design Week.

April 24 2018

<https://medium.com/wonderings-publication/prototypes-and-props-playtests-and-pilots-c4baaa31c667>

Summary:

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**Overview of workshop activities and materials**

This 90 minute workshop for 12 people was part of a series of events as part of WonderLab's first public Play Date as part of Design Week 2018.

Using the metaphor of research space, laser-cut felt shapes and travel guides were designed to reference toys and encourage playful exploration of self in relation to research trajectories, and collaborators. This workshop embodied the ethos of a WonderLab playdate in which we share wonders and ideas in progress to test and get feedback. This one specifically explored the playful potentials for metaphors and the affordances of felt.

After brief introductions to the activity and each other, we assembled rocketships using a colour-coded guide to think about:

- 1) How you venture forward
- 2) How you see the world
- 3) How you chose directions
- 4) What lights your fire

We then created our individual research spaces by selecting from the available felt shapes, including elements such as asteroids, planets, UFOs and shooting stars. These were selected and arranged in an iterative process of making and sharing intermittently as we arranged and swapped out elements.

Participants were invited to select someone else's research space they'd like to visit, and an emergent way of actually rearranging and discussing changes to each other's space emerged through the workshop in ways that were unplanned.

The workshop concluded with an opportunity for written notes and reflections in the journey log booklet, and a group discussion both about our various research undertakings and the activity and materials used.

For my Research

This workshop explored the potential of the materials to inspire open and exploratory play and the physical affordances of felt. It also exposed some of the challenges of adapting to unintended use, and the loss of control as directions are changed to accommodate what materials are making possible.

Figure 5. Workshop #2

More information at the exhibition: <https://www.alliedwards.com/2-research-space>

3 She City

Jul 30 2018

| XYX Lab's Exhibition part of Workaround: Women in Architecture at RMIT

Link: www.youtube.com/watch?v=9-PaMk6gOIQ&feature=youtu.be&ab_channel=RMITDesignHub

Summary:

This exhibition with almost 100 attendees took the form of two consecutive 4 hour workshops that were developed to raise awareness and engagement with issues of women's safety in urban spaces. It was also designed to demonstrate first-hand the engagement and problem solving methods the XYX Lab was employing and developing to do work in this space. The workshop was also attended by the design and architecture students from Monash University's She City studio elective unit which I taught alongside Zoe Condliffe, supervised by Nicole Kalms.



Overview of workshop activities and materials

The workshop consisted of both drop in activities as well as the more structured 4 hour workshop.

For participants dropping in to the exhibition there was:

- a video screening area produced by XYX Lab and videographer Ella Mitchel showing stories from young women about safety in the city
- a large topography map created by Gene Bawden and Pamela Salen to label with aspects making those spaces feel safe or unsafe
- an activist paste up postcard that could be written on and taken away to paste up in the city.

The structured workshop structure took participants from individually connecting to the topic through the creation of paper tetrahedrons, watching a presentation about the issue and video footage of women sharing several stories, working as a group to identify contributing factors and causes using a worksheet, then modelling solutions to the stories that were based upon data from the Free to Be Melbourne crowd mapping and story sharing app that shared positive and negative experiences in the city.

Groups then modelled ideal versions of the story using paper city elements and paper people that had intentionally diverse accessories and skin colours.

Because the main goal of this workshop was to engage and entertain audiences and showcase the participatory methods, the production of the city elements was the main activity and discussions were around presenting what was made.

Footage from the event was used to create the She City episode 8, which spoke more broadly to women in architecture and creative practices.

For my Research

These workshops demonstrated the ability of materials to engage and invite collaborative ways of working with strangers, and to problem frame by suggesting certain issues are in scope. It also revealed potential pitfalls of superficial engagement and the potentially empty rhetorical arguments created when the artifacts are documented and displayed without deeper analysis or space for dissensus.

Figure 6. Workshop #3

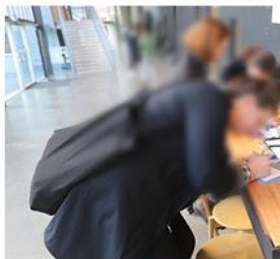
More information at the exhibition: <https://www.alliedwards.com/shecity>

4 MADA Queer Creators Zine Making Workshop Hosted by XYX Lab and Monash Art Architecture and Design (MADA)

August 28 2018

Summary:

This three-hour workshop took place during Monash's Diversity and Inclusion Week, and sought to bring student voices and creativity to inspire a panel presentation and create a sense of creative community. It built upon the previous year's panel discussion about queer practices, and sought to engage students more. Using the creation of Zines and postcards, students were invited to contribute their thoughts about what it meant to be a queer creator, and what was queer or not queer. The visual and verbal contributions were discussed by the panelists and incorporated into discussions of their own practice at the talk in MUMA Gallery.



Overview of workshop activities and materials

This workshop took place in an open space where students walked by and was open to art architecture and design students of all orientations and genders. Black stands to display student work were procured and there was a selection of local and Monash specific queer-identifying art music and design were on display. For several hours in the afternoon students were encouraged to create zine's or cards responding to the prompts, or sharing their own version of what it means to be a queer creator. An illustrated guide to create zines was left up and options to create smaller cards were available as well.

The art created on the night was displayed and documented then discussed later in the week by a panel of 5 Mada staff and students, who responded to themes and provocations created at the make-athon as well as discussing their own practices. The discussion in response to student generated work was more provocative than the previous year's sharing of practice, delving into discussions of when queer voices are centered and when they are not, as well as how identity can be commodified and used by institutions. The content created stayed on display at MUMA for diversity and inclusion week.

For my Research

This workshop emphasised the importance of having a shared group purpose for participation beyond an invitation. It also showcased the ways in which material facilitation can be balanced with open ended exploration, and the benefit of having some people comfortable making to help encourage others. This informed future exploration of balancing between carefully scaffolded and guided activities and open creativity.

Figure 7. Workshop #4

More information at the exhibition: <https://www.alliedwards.com/4-mada-queer>

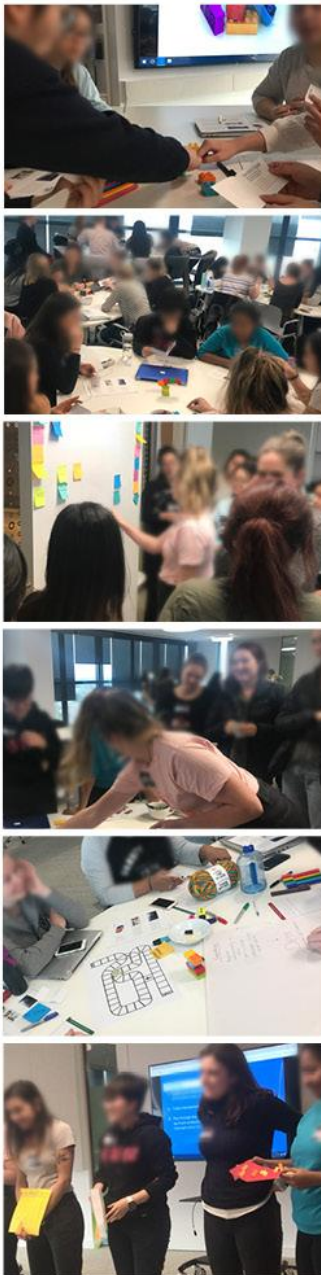
5 Student Teamwork Playdate

Jul 30 2018

Summary:

Created and facilitated with Kiri Beilby, Senior Lecturer with Monash School of Reproduction and Development and with Dr Martijn Van Der Kamp, Scholarly Teaching Fellow with the Monash Business School

In this full-day catered workshop hosted by Monash University, 24 graduate medical students co-designed teamwork interventions for other teams. This was developed as a way for students to learn about “teamwork” through their own experiences, and to practice working as a team by designing a playful intervention for a different team. It explicitly used design thinking as a problem-solving scaffold and provided craft materials and game elements such as boards and pieces to assist with the development of playful interventions.

**Overview of workshop activities and materials****Workshop structure**

1) The workshop started off with a lego challenge in which students who were currently working on a project together were in a group. Each had a different set of directions and information known to them. Without giving away what their cards said, students had to work together to create the indented sculpture and listen to directions from others and negotiate.

2) Teams debriefed in a discussion about the activity, questions about what made a good team, and what good teamwork looks like.

3) Martijn presented the history, definitions, and theoretical models behind teamwork based upon his research.

4) Students brainstormed about challenges they faced when working in a team followed by a sticker vote to select the top challenges.

5) Groups selected a challenge to work on and were introduced to Design thinking as a way of working through challenges without one solution and being open to new ideas.

6) Groups used craft supplies and game elements like blank boards and cards to create their own game-like interventions that would help teams with the specific challenge identified.

7) Groups were encouraged to learn by doing and test out ideas early on, then play tested each other's games and made refinements according to feedback.

8) Groups presented what they made and as a class they discussed how it would improve teamwork, and the behaviours and mindsets it would strengthen or increase awareness of

After the workshop

Students were surveyed two months later and asked to share how they had responded to teamwork challenges, as well as how their understanding and awareness of their own teamwork behaviours had changed as a result of the workshop.

For my Research

This workshop demonstrated the value of hands-on making and prototyping, and the way game material like dice, boards, cards and even wooden paddle pop sticks can help co-create games even with participants who are unfamiliar with game mechanics. It also suggested that the novelty of crafts materials and a workshop space can signal a different mode of working and collaborating.

Figure 8. Workshop #5

More information at the exhibition: <https://www.alliedwards.com/5-student-teamwork-playdate>

6 Ally Network Conference

September 28th 2018

Link: http://humanrights.curtin.edu.au/wp-content/uploads/sites/27/2018/10/ALLY_Conference_Program-31-10-18-v5-FINAL-Reduced.pdf

Summary:

The Ally Conference Workshop had about 20 participants and was hosted by Curtin University in Perth, Western Australia. I was asked to contribute to the conference by a convenor who was familiar with XYX Lab's previous workshop with the Victorian Pride Centre. Attendance was open to all members of the conference, with no limit on how many people could take part and no pre-registration. It took place outside in the atrium after the keynote and had about 20 participants.



Overview of workshop activities and materials

Workshop Objectives

- Create a space for participants to connect and meet with people from other institutions
- Explore possibilities for a more connected Ally Network beyond the conference and inspire independent groups to collaborate more.
- Surface and document what participants at the conference wanted for the future of the ally network

Workshop Structure

- 1) Participants were invited from the congregation of people in the atrium and signed ethics and media consent
- 2) Brief introduction and Acknowledgement of Country
- 3) Participants introduced themselves using laser-cut paper tetrahedrons (Three sides asking things you do as an ally, and then writing what would support that on the tabs.)
- 4) Participants shared and discussed, order determined by who can connect to something the last person shared.
- 5) Participants identified their main goals as an ally, and what the Ally network could do to support that to form group around similar aims.
- 6) Groups discussed how the network would function and visualised connections and supports using paper blocks to think about scaffolding and structures that are already in place.
- 7) Groups presented and shared their main ideas

After the workshop

Key themes were summarised and outcomes were forwarded to the convening members and mentioned in the closing address and incorporated into their plans for the next year.

For my Research

This workshop raised awareness that I step into a facilitation role with my material co-facilitators. It demonstrated the power these workshop materials can have to attract attention and create shared feelings of participating in something out of the ordinary and willingness to share and help other people who were previously strangers. It also reminded me of the dangers of asking too much of materials, or assuming that materials will perform the same way in a different context, even if my facilitation is the same.

Figure 9. Workshop #6

More information at the exhibition: <https://www.alliedwards.com/6-ally-network>

7 Re-Imagining Data in Creative Practice

March 20 2019

Melbourne Design Week

Link: <https://www.ngv.vic.gov.au/program/re-imagining-data-in-creative-practice/>

Summary:

This workshop was created and facilitated with Kelly Anderson from Wonderlab with 33 people from various backgrounds in attendance. It was generously hosted by Testing Grounds (<https://www.testing-grounds.com.au/>), and was part of Melbourne Design Week 2019, sponsored by the National Gallery of Victoria, both of which I would like to acknowledge.

This workshop took place for two and a half hours after work and only used recycled materials and basic craft supplies such as yarn, paddle pop stickers, papers and cardboard.



Overview of workshop activities and materials

The goal of this workshop to explore ways of re-imagining what counts as data, how it is generated or documented, and what we do with it. After a brief introduction to Kelly's and to my own practice and some framing of "Data," participants were invited to make their own data devices using the recycled parts and craft supplies. Participants then performed their devices, acting out how it would work and sharing shifts in their thinking about what counts as data.

Structure

- 1) Introduction and Acknowledgement of Country
- 2) Ice breaker activity asking people to physically arrange themselves in space according to perceptions of data. This proximity was used to form groups
- 3) Data devices were created
- 4) groups presented their devices and created gallery cards for an exhibition and documentation.
- 5) Group discussion about data and methods.
- 6) Participants filled out surveys see appendix:

After the workshop:

Kelly Anderson and I put together a return report that reported back the events of the workshop and key outputs to provide a summary, and inspiration for further consideration.

Kelly Anderson and I analysed the videos, and examined how people were using physical affordances and visual provocations to inform their ideas, and when people had modified the materials to express an idea.

A post-workshop survey was sent out but no one responded to it.

For my Research

For my research, this workshop surprised me as I saw people inspired by and creating ideas based upon the suggestions of offcuts and recycled materials. The materials hinted at the appropriateness of low fidelity and even comical creations since the aesthetic of the artefacts produced were rough and unrefined, contributing to a playful and laid back atmosphere.

Figure 10. Workshop #7 More information at the exhibition:

<https://www.alliedwards.com/7-reimagining-data-in-creative-practices>

8 Gender-Sensitive Design Lens

Oct 29 2019

XYX Lab & Moreland City Council

Link: <https://www.monash.edu/mada/research/moreland-city-council>**Summary:**

This full-day catered workshop was commissioned by the Moreland City Council and was designed and facilitated in partnership with the XYX Lab. Special acknowledgement goes to student designer Hillary Edmiston for laser cutting the materials and to Isabela Webb for design support in putting together the final return report. The rationale of the workshop was to bring together 50 council members who would be working on projects affected by an upcoming reduction in on-street parking, in order to discuss how this would affect women's safety at night. Larger objectives included introducing a gender-sensitive design lens that council members could take back to their various projects, and highlighting the importance of involving the community (especially women and girls) in decision making. A major concern was that many council members did not view gender as an issue and they were being selected by their supervisors to come to this workshop, not volunteering.

Overview of workshop activities and materials

- 1) Participants were welcomed as they signed in, received their name badge and table numbers (since participants were pre-sorted to create a diversity of backgrounds at each table), signed ethics and media consent forms. There was a coffee cart outside providing beverages.
- 2) There was a brief Acknowledgement of country by the Moreland City Council, and an introduction to the XYX facilitators and the objectives.
- 3) Participants introduced and greeted each other by playing an Icebreaker game designed as a primer for this workshop. Each participant had a different barrier or enabler to participation, and people were asked to meet as many people as they could.
- 4) There was a group debrief about the ice breakers, who won and why; and a discussion about what other culturally expected social scripts exist that are either explicit or sometimes subtle.
- 5) Zoe Condliffe and Nicole Kalms presented research and analysis of several of the council's current policy documents and introduced the three themes of the workshop.
- 6) Table groups consisting of council members from different departments and community members modelled stories or statistics using the designed city elements. Three of the groups had intentionally bespoke paper people and the other half had white paper people.
- 7) Groups then implemented changes to the scenarios, making changes to the model.
- 8) Groups presented to each other, recording the different ideas and strategies on sticky notes then used a matrix to debate the potential impact and discuss whether the proposed ideas were similar or different to what was currently being done then selected top ideas, discussed as a group.
- 10) In table groups, participants sorted through various visual metaphors of lenses and filled out a personal take-away booklet. The booklet and group discussion guided reflection about the questions and ways of working they had been enacting throughout the day and encouraged them to write down something that would help them further develop their lens.
- 11) The workshop ended with a circle discussion about takeaways and the next steps people wanted to do to further develop their gender lens.

After the workshop

XYX Lab delivered a return report to Moreland City council summarising the day's activities, outcomes and ideas relating to the upcoming changes to on-street parking, and recommendations for next steps for implementing gender-sensitive design approaches.

I interviewed 5 of the attendees about their experience.

For my Research

For my research, this workshop was an opportunity to explore the way the materials we design or bring to these events make different futures thinkable, discussable, and documented for reference. Blank people revealed underlying assumptions but were a creative barrier to considering who is in these spaces. Conversely, intentionally diverse people prompted more consideration of identity, yet could be used to create a sugar coated picture of inclusion and progressive views.



Figure 11. Workshop #8

More information at the exhibition: <https://www.alliedwards.com/8-moreland-city-council>

9 Welcome to the PlayTank. Re__ing Research

Jul 30 2018

PlayTank Collective

Link: <https://www.aare.edu.au/publications/aare-conference-papers/show/13311/welcome-to-the-playtank-re-ing-research>

Summary:

This workshop was the brainchild of Arts Educator Dr Sarah Healy, Eco Feminist and Pedagogista Alicia Flynn, and myself. This workshop was designed for a special interest group of New Materialists at the Australian Association for Research in Education and was designed through a process of slow and evolving playful prototyping. This consisted of meetings over several months with each other, materials and theory exploring how we might enact feminist and new materialist methods in this workshop space. The objective of the workshop was to provide a space for re__(fill in the blank)__ing research, while also experiencing a more affirming and collaborative approach to materially mediated knowledge creation. Critical and poetic theory influenced the ideas during the creation of the workshop, and several excerpts were read during the workshop as evocative background theory. *I was the recipient of this special interest groups' bursary award and would like to acknowledge their support.



Overview of workshop activities and materials

1) Acknowledgement of country and introduction to ourselves, and the thinkers we were bringing with us into the workshop.

2) The workshop used a theoretical excerpt (Kwaymullina, 2005, p. 12) to set the structure, and then introduced different material co-facilitators each stage.

3) Individually participants considered and made visible the micro worlds of their own research space using paper cutouts and homemade playdough. In groups of four participants joined around the "Intermezzo playground" a white poster board with Playground rules:

- No colonising: Players must be added one at a time and with group discussion. Agreement is not always required, multiple versions of an ideal research collab may exist respectfully in the same playground.

- New Friends: Each player leaves behind their predefined contexts when they enter the play tank. Relations configure as new friendships are formed.

- Response-ability: Who/what are the players response-able to? Who/what will enable becoming in an affirming way?

5) As a group participants moved their players into a shared space, discussing the relations and what is being created.

6) For the final stage of making, three-dimensional paper shapes were introduced as ways to explore hierarchy and power, and the politics of the playgrounds were interrogated, including who and what was left out of the more idealised versions of research assemblages.

7) For the end of the workshop we had a circle discussion about what it was like, how it enacted New Materialist ethos, and a participant passed around homegrown tomatoes, contributed by a participant.

For my Research

For my research, this workshop was a chance to explore different accountabilities by having materials that were not as photogenic but were compostable and reusable. The feedback from participants appreciating the care that went into the material decisions reinforced my growing belief that these materially mediated spaces offer ways of becoming and enacting affirmative ethics that can not only inspire new thinking but ways of enacting collaboration and research differently, and that the materials can help set the stage and facilitate this way of relational making.

Figure 12. Workshop #9 More information at the exhibition: : https://www.alliedwards.com/9-playtank-re__ing-research

10 Gender, Cities, and Participatory Design: bridging diverse perspectives through multiple entry points and parallel problem frames (DRS Online)

August 12 2020

Link: https://drs2020.org/wp-content/uploads/2020/07/DRS2020_Conversation_Workshop_Abstracts.pdf

Summary:

This workshop co-created and facilitated by Hannah Korsmeyer was adapted to be online for the Design Research Society conference. In this workshop, we experimented with how problem framings influence the perceived scope and modes of inclusion or exclusion in issues around women's safety in urban spaces influence the co-design process. In order to experience the problem solving through three different framings, a set of people and city element pngs were developed for participants to prototype with, using the online collaborative platform Miro.



Overview of workshop activities and materials

This workshop took place on Zoom and we designed a Miro board to guide group work and explain activities. The design of the Miro Board mirrored activity flow in an inperson workshops, starting with introductions and a warm up, visually modeling in small groups, and drawing out insights and takeaways.

Three different framings of a problem were introduced:

- Fixing - What are some of the urgent gendered problems that need to be addressed in cities?
- De-Centering - What would this space look like if it was not designed a default male user (default white, middle-class, able-bodied, cisgender, heterosexual, neoliberal.... user)?
- Speculating - Imagine how this space might look different if there were alternative gendered power dynamics or alternative conceptions of gender to what we have today. How would these new values/configurations influence the way cities are designed and are used?

In zoom breakout groups participants used pngs of illustrated city elements to model and discuss ideas based upon the framing of the problem. They then shared back their versions and discussed differences, and how the framing influenced the outcomes.

After the Workshop

An optional email survey was sent out to provide more input and discussion, and several participants shared more about their experiences and ideas about the role of problem framing and decentering vs including.

For my Research

This workshop was an opportunity to further explore the capacity of materials to frame problems and situate participants in relation to verbalised problem framings and directions. Especially when translated into a digital space, the ways materials were constraining certain possibilities and influencing outcomes as well as guiding conversations and making certain topics relevant was confirmed. However, it also revealed how even curated sets of materials can be disregarded by confident participants, and the importance of including open ended and customisable ways to contribute in a less constrained way.

Figure 13. Workshop #10 More information at the exhibition:

<https://www.alliedwards.com/10-diverse-perspectives-and-parallel-problem-framing>

11 Bespoke Tools for Co-Designing Diverse & Inclusive Feminist Futures Service Design Online Conference

Jul 30 2018

Link: <https://servdes2020.org/events/85-bespoke-tools-for-co-designing-diverse-and-inclusive-feminist-futures>

Summary:

This two hour workshop Co-Designed and facilitated with Hannah Korsmeyer was designed to be online, and to explore how materials are being used, especially in workshops where diversity and inclusion or the creation of equitable futures is at stake. Prior to the workshop participants were emailed a day in advance asking permission to record and document, links to the Miro Board, and the request to have an image of materials from their practice to share.

Overview of workshop activities and materials



1) We started with brief introductions and a warm up activity using three different sets of people and city elements, colourful ones that required assembly, diverse and detailed silhouettes and more ambiguous people forms.

2) Groups briefly modelled their ideal urban scenarios then we had a discussion about the way the materials either enabled or constrained certain decisions.

3) The framework proposed in this PhD: Tools, Toys, and Technologies was introduced as a way to think about what materials were doing beyond surfacing ideas.

4) Participants were consulted about whether they wanted more time playing with metaphors or discussing each other's work since due to the time differences it was late at night for many of the participants.

5) After voting for more time playing, participants were briefly invited to share examples from their own practice, and in pairs, they discussed and recorded what they saw their materials as doing, precluding and making possible.

6) Back in the main group, several volunteers shared something interesting that came up for them in the conversations.

7) The group elected more time to play so 30 minutes was reserved for the teams to create role cards using emojis to inspire thinking visually and metaphorically about the role played by co-design materials. This was intentionally framed as in service to a more participant approach, seeing what role the materials could play beyond problem-solving.

Post Workshop

Participants were sent a summary report to add comments and their insights into. This was then published on Figshare research repository with the participants who wished to be named listed as contributors. These are documented here Edwards, Allison; Korsmeyer, Hannah (2021): Bespoke Tools for Co-Designing Diverse & Inclusive Feminist Futures. Monash University. Report. <https://doi.org/10.26180/15066390>

For my Research

This workshop confirmed the value in considering the ways in which materials are active and influencing the problems, people, and possibilities at stake in the workshop. It also highlighted the importance of creating space for peer to peer sharing and learning, and having the designed materials to help facilitate these discussions. This was another opportunity to test the considerations for practice I had developed for in person workshops, and things like playful introductions, opportunities to share in small groups, and ways of making the collective effort visible still were valuable.

Figure 14. Workshop #11 More information at the exhibition:
<https://www.alliedwards.com/11-bespoke-tools-for-feminist-futures>

12 Co-Design Materials for Climate Action

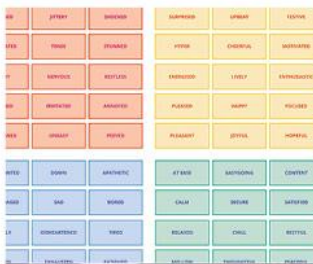
Melbourne Design Week

April 1 2021

Link: [ps://designweek.melbourne/events/reframe-codesign-materials-for-climate-action/](https://designweek.melbourne/events/reframe-codesign-materials-for-climate-action/)

Summary:

This 2 hour in person workshop with 20 participants was co-designed and facilitated by Ilya Fridman and benefited from collaboration with Professor Lisa Grocott. It took place in person at the Melbourne Recital Centre, and was generously sponsored by the National Gallery of Victoria for Design Week 2021. It was developed to explore the way giving name to specific emotions and material making could enable reflection, discussion and deeper understanding of emotions regarding climate change and climate action. As part of Design Week it was attended by both designers and creative practitioners, and non-designers who were invited by Ilya and myself, who followed WonderLab for events, or who read about this on the website.



Overview of workshop activities and materials

1) Participants were welcomed and introduced to the theoretical underpinnings of this workshop including ideas about Cultural Trauma (Robert J. Brulle & Kari Marie Norgaard (2019); Emotional Agility (Susan David 2016); and Emotional Granularity (Marc Brackett 2019).

2) Printed re-designed versions of Brackett's (2019) Mood Meter were distributed and participants were invited to sit with and explore different emotions.

3) The materials were introduced as co-facilitators and participants were invited to work through an emotion or combination of emotions using the materials at their tables:

- a) A re-usable set of evocative image cards
- b) Arangible laser cut paper shapes including humans, buildings, trees, fires, and more ambiguous elements.
- c) Homemade compostable playdough with food colouring colours and eucalyptus essential oils
- d) Natural materials gathered, such as leaves, seedpods, stones, twigs, and grasses.

4) After 20 minutes of making and chatting, participants were invited to go to a different table with different materials. With different people at the table and new materials they were invited to work through a different emotion. This repeated three times.

5) After working with three out of the four materials, there was an end reflection for participants to share what it was like reflecting on climate change and working with materials.

6) The workshop ended with a group discussion about their experience and observed differences between sets of materials. Participants then asked further questions regarding the theories of emotional granularity and our approaches to material making.

For my Research

This workshop solidified my belief that different modes of making can help different people access different aspects of their experiences, and how different people will have different experiences with a given material depending upon the composition and unique experiences of their group. It also illustrated how playful, ambiguous, suggestive, and evocative prompts are all important in different ways.

Figure 15. Workshop #12 More information at the exhibition:

<https://www.alliedwards.com/12-codesign-materials-for-climate-action>

2. Positioning my Research

In the previous chapter, I framed the contemporary challenges and contexts that co-design is being applied to, and how the materials designers rely upon to create these engagements are often conceptualised as facilitation and thinking tools. I argued that the current framing of co-design materials ignores the materials' active participation in the process and illustrated how entangling new materialist theories of agential realism enlivens materials. I then posed my research question: how does feminist new materialism enable different ways of thinking about materials? This question required ways of thinking with theory (Jackson and Mazzei 2012) that were suitable for a practice-based design project and that led to a deeper understanding of how these theories enable me to not only think about and conceptualise my relation with materials differently, but put this understanding into practice.

In this chapter I describe an approach to methodology that is situated in practice-based research yet productively diffracted by a new materialist ethico-onto-epistemology. I map out the various methodological moves I made, and discuss how doing this research brought St. Pierre's (2019, 2021) refusal of methods into an uneasy conversation with Yee's (2010) call for methodological bricolage in design PhDs. While acknowledging that this iterative approach to enacting methodological moves does not entirely appease St. Pierre's refusal of methods, I articulate how it allowed me to develop a sympoietic approach to working with data through the writing of practice narratives.

2.1 Questioning Design Through Designing

Assessing the changing landscape of design doctorates, Yee and Bremner (2011) describe a shift from non-designers asking questions of the discipline to designers themselves asking questions through practice. This way of interrogating design, and creating contributions to knowledge more widely through the practice of designing is becoming more evident in the way research questions are conceptualised and investigated. Despite efforts to smooth out and systematise this mode of questioning such as Frayling's (1993) framework of research for, into, and through design, Nigel Cross's design sciences movement, and efforts to create frameworks for practice-based research (such as those by the Royal College of Art), there remain many murkily defined and often conflated understandings of the relationship between practice and research (Oliver 2018).

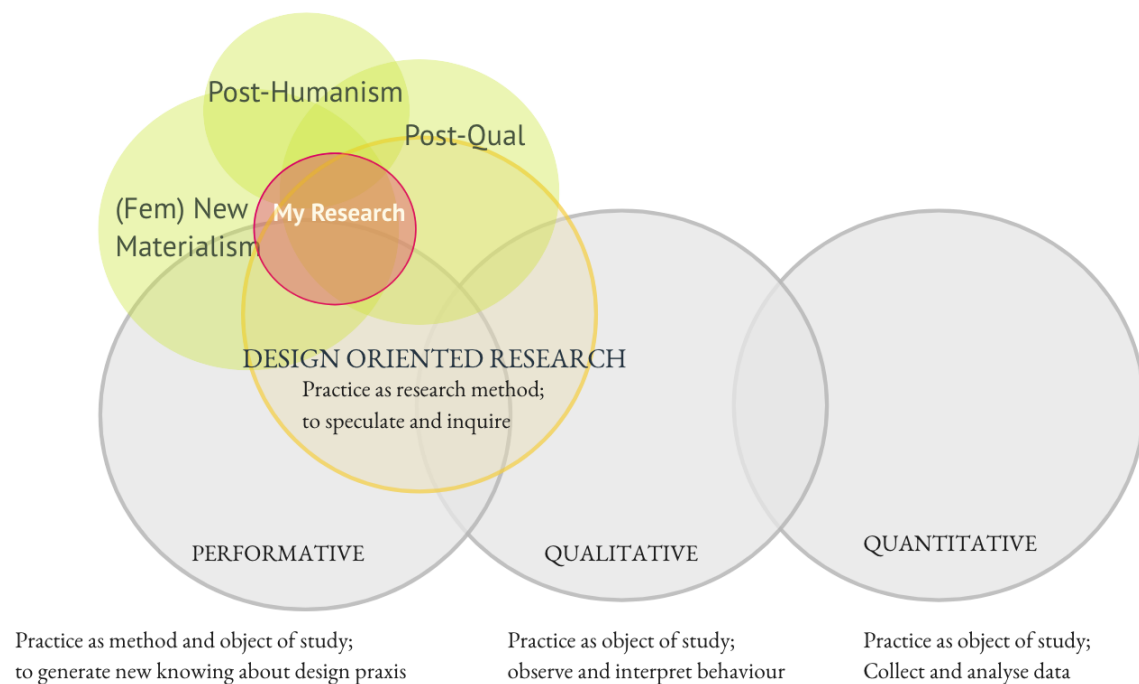
The approach to research I'm discussing falls under what is generally considered "practice-as-research" (Ibid, p.7 following Robert Nelson). This catch-all term, which includes practice-based research, serves as a methodological position and approach, where "the application of a creative practice, whether as context, method or outcome, is a key generative mode for the research" (Oliver 2018). Grocott (2010) frames this "design oriented research," explaining that within this relationship between practice and research, designing as an act becomes "both performative and methodical" (Grocott 2010). Performatively, the practice-based doctorate "advances knowledge partly by means of practice" (Frayling 1997, p. 18 in Oliver 2018). This lets performative researchers follow what Haseman (2006) calls an 'enthusiasm of practice' — something which is exciting, something which may be unruly, or indeed something which may be just becoming possible" (100).

For my research, the performative part of Grocott's proposition took the form of the design and facilitation of 12 co-design workshops. These were conducted with external partners and accountabilities in real world settings, as well as with other creative practitioners and academics. These provided sites of practice in which I could question design through designing and the potential to generate and apply knowledge through practice. The other part of Grocott's equation is the methodological considerations. While Yee (2010) proposes that design PhDs by nature will involve some sort of methodological innovation, in this project the entanglement of new materialist theories meant a different relationship to methodology and the doing of research in more dramatic ways.

2.2 Design Oriented Research +

While my research was grounded in design practice, the theories of material agency I was working with came with ethico-onto-epistemological implications to how knowledge is produced, and how methods are related to and enacted. These shifted my initial conception of design orientated research and added new accountabilities and conceptions about what can be known and how; expanding the initial positioning of design oriented research proposed by Lisa Grootcott in figure 3 below.

While she positioned design oriented research as grounded in and extending beyond qualitative and performative research, my research further extends the speculate and inquisitive methods and line of inquiry by entangling new materialist ethico-onto-epistem-ologies (Barad 2007; Braidotti 2019). A figure of where my research is positioned is below, followed by a discussion of how these shifts impacted my research.



Onto-epistemologies that enabled a different relationship to practice and material agency



Initial framing of Design oriented research adapted with permission from Lisa Grootcott (2010) Design Research and Reflective Practice

Figure 16 Positioning my research orientation.

New Materialism

While I grounded this project in practice based research, it was expanded and complicated by the ontologies I was thinking with to re-frame material agency, since a new materialist conception of research is less concerned with human agents and abilities. Fox and Aldred (2015) cite Deleuze to explain, “the concern is no longer with what bodies or things or social institutions are, but with the capacities for action, interaction, feeling and desire produced in bodies or groups of bodies by affective flows” (Deleuze 1988, p. 127 cited in Fox and Aldred 2015). In examining these capacities for action within assemblages (rather than individual bodies or entities) the scale of analysis such as micro, meso and macro are blurred, and the researcher is implicated in and amongst the research assemblage. This meant I was not simply writing up research findings, it also demanded that the approaches to methods I used could not be presupposed but had to be enacted alongside theory, which positions this research in the space of Post-Qualitative Inquiry.

Post-Qualitative Inquiry

Emerging from the need to present and report upon findings that attend to these affective and dynamic forces rather than stable identities, as well as epistemological critiques from the other ‘posts’ like post-structuralism, Post- Qualitative Inquiry has emerged in recent years stewarded by Elizabeth St. Pierre (2019, 2021; Lather & St Pierre 2013). Post- Qualitative Inquiry suggested I could not represent an objectively knowable reality, and that even if I could, there was no static “subject” to represent (McClure 2013). It instead suggested a ‘flattened’ logic (DeLanda, 20019; Hultman & Lenz Taguchi, 2010) where “discourse and matter are mutually implicated in the unfolding emergence of the world.” (MacClure 2013). This research paradigm asks “What could be becoming if we were able to resist the present” (St Pierre 2019;2021).

Post-Humanism

This was a smaller yet still vital sphere of influence on my research. As I tried to better understand the ethical turn demanded by (especially feminist) new materialisms, Post-Humanism was a literary guiding light. Especially Braidotti's (2019) *Post Human Knowledge*. It was reading from Haraway and Braidotti that informed my drive to explore what was happening in these workshops beyond problem solving, and to attune more to what futures are becoming possible to think, in Haraway's words, “[i]t matters what matters we use to think other matters with” (2016). Accounts written with this way of thinking opened my eyes and kept challenging me to not centre on human usage but to attend to how the materials are participating and how this agentic potential is enabling and constraining.

These three research paradigms inform how I position my research, seen in figure 3 above.

The addition of new materialist, post-humanist and post-qualitative concerns informed not only the doing of, but the outcomes of this research, resulting in moves away from accurately defining, labelling or fitting material agency into a framework. Instead, through this research working with new materialist theories I sought to create conceptual provocations that would resist the current instrumentalisation of materials as tools, and that could add further articulation and nuance to the emerging recognition that materials actively participate in these processes of collaborative creation. The specific approaches to methodology this called for are described next.

2.3 Methodological Moves

Within this expanded approach to practice-based research, it was difficult at first to know where to start. Designing and facilitating workshops provided a rich way to experiment and observe, but to follow performative, new materials and post-qualitative approaches to methods I needed to construct knowledge in a way that did not essentialise, but rather attuned to what materials were making possible. I needed ways of knowing and constructing knowledge that were not just my own designerly observations but were created with other participants, human and non human alike.

Yee and Bremner (2011) examine the creation of and enactment of methods in design PhD dissertations and, thinking with Law and Urry (2004), posed the question, “If methods not only describe but produce a reality that they are trying to understand, what methods should designers use to ask questions about the future?” (in Yee & Bremner 2011). Rather than answering this, they propose the use of bricolage, suggesting that “the bricolage approach enables the design researcher to explore questions in a space that allows for indeterminacy but provides enough confidence in the value of its outcomes” (6). This grants designers as researchers the licence to “create new tools and techniques in order to address questions that are beyond the realm of the established discipline.” (ibid 3). Lee (2014) acknowledges this tendency for designers to not only bring together different methods, but to adapt and invent methods in relation to the people, context and materials available. Especially when dealing with empathetic methods of learning about lived experiences, Lee argues that more attention should be paid to the ways in which designers enact methods, beyond reproducible techniques or in search of scientifically valid findings.

This is commensurate with new materialist claims that different methods and methodologies ‘cut’ data in multiple ways, as does intra-action with researchers’ own theories, insights or reflections (Fox & Alldred 2020). In this way, a methodological bricolage provided a way to stay with the concerns of a new materialist epistemology, and to work with St Pierre’s (2021) refusal of method that is predetermined, as well as Manning’s (2015) warning that method constrains possibilities to the point of harm. It also allowed the sort of flexibility I needed in order to work with and ‘be worked on’ by the data (Healy 2019) generated through the practice of designing the workshops. These methods were iteratively developed, applied, and unfolded throughout the my research in relationship with the workshop I was delivering and the participants involved.

In figuring out how to attend to how the materials were performing as parts of assemblages in different workshops, I employed various ways of paying attention and generating data, mapped here as methodological moves. While this was originally conceptualised as a triangulation between myself, participants and materials, the iteration and evolution of how methods were applied resulted in more of a

choreography. Because they were not predetermined and were enacted in this responsive way, I am considering these ‘methodological movies’. As seen in the figure below.



Figure 17.
Methodological moves

Methods

Following a practice-led research approach, I used the design and facilitation of the 12 co-design workshops introduced previously (1.5) to progress understanding, and challenge assumptions I had about the role of materials. Each workshop invited different ways of learning more about myself, the materials and the participants, which came together to form the choreography of methodological moves above, and discussed chronologically here.

Before each workshop, I listed the considerations behind the design decisions I was making, from arrangement of chairs, to the inclusion of certain printed patterns, and ordering of activities. This listing acted as a self reflective exercise to articulate what I was attending to, a point of comparison to refer back to after participant interviews, a check in and catalyst during the reflective writing of practice narratives, and became part of my planning process in my professional practice. Before the workshops where I had space to experiment, I intentionally designed the workshop to reveal differences, such as by using two different sets of materials in the same workshop, or conducting a similar activity in a different workshop context. By going into each workshop in these ways I could use the workshop to not only see what I was attending to as a designer, but also better understand how materials were performing.

During these workshops I explored different ways of documenting and note taking as a participant-observer and paying attention to how I was part of the research assemblage, as well as considering new ways of perceiving the materials in action. This looked like handwritten notes and voice memos describing empirical events that were happening, ways of framing what materials were doing that were coming to light, ways the considerations were evidently impacting the event, and writing down key quotes and things participants said.

I also experimented with several ways of eliciting qualitative feedback from participants, both in the moment and after the event. At the end of the workshop I handed out surveys asking questions about their expectations, experience, and if there was anything they particularly appreciated or would have changed. This took place in each workshop through some combination of prompted end discussions and surveys eliciting feedback and asking questions about their experience. Some workshops, like the Moreland City Council workshop (8) afforded the opportunity to conduct longer in-depth interviews two months after the workshop, and some workshops such as the team work playdate (5) and Service Design (11) included more formal modes of inviting feedback through end reports and follow up discussions.

As this research continued, I also started more casually interviewing participants in the moment of making, paying attention through photographs and video, and asking participants questions or sharing observations to invite further discussion. This approach was less possible in workshops where I was facilitating for an external organization, but was developed in workshops 9, 11 and 12 where the objective of the workshop was predominantly to experiment and the participants were capable of discussing their experience in real time without being pulled away from the activity. This qualitative data created helped inform the reflective writing about my experiences, but I also wanted to generate insights that weren't my interpretation.

Inspired by new materialism I tried ways of learning from the materials themselves, through examining what happens with different materials in the same workshop, and the same materials across different contexts. The personal and responsive enactment of methods called for by new materialism seemed to work well with practice-led research, which was enabling me to do the sort of "Worldmaking projects and meaning-making inquiries" called for by St Pierre and Jackson (2014). However in analysing the data to propose a framework, I encountered the biggest challenge of this PhD research.

Dissonance and Diffractions

Iteratively experimenting with different methods by which to attune to the materials and eliciting feedback and insights from participants, proved particularly useful since I could adapt methods depending upon the willingness and interest of various groups of participants in each workshop. I had pages of notes I had written as a participant-observer, as well as notes and some audio recordings of people discussing their experiences with me, and talking to me while making. Beyond qualitative data, I also had documentation taken by others as well as my own photographs and even some physical artefacts and materials I saved. However as I started to analyse how the data generated through these methodological moves was letting me re-conceptualise the role of materials, I began to see how the onto-epistemology of new materialism was incommensurate with the social constructivist approach to methods and research that a background in design had prepared me for. Fox and Alldred (2015) explain the objectives of a materialist social inquiry, asserting “its orientation must be towards what things do, rather than what they ‘are’; towards processes and flows rather than structures and stable forms; to matters of power and resistance...” (407). The methods of designerly analysis, such as the observation of participants and interpretation of their experience that Aguirre, Agudelo and Romm (2017) employed to create their framework tend towards labelling and classification of things as static entities, rather than mutually becoming, as proposed by Barad (2007). As I started experimenting with ways of coding surveys and analysing interviews I felt the pull to more traditional modes of analysis that these methods seemed to call for.

St Pierre warns that a study that starts with a qualitative methodology cannot be post qualitative—the two approaches are incommensurable (2021, p. 5). I felt like I could fit these methods into my research positioning since I was starting from a performative practice based approach (Haseman’s 2006) and these methods were emerging in an intrinsically experimental way from the embodied design and facilitation of the workshops. As a practitioner, the conversations with participants in the moment and watching materials in action in different contexts seemed to be progressing the way I was thinking about what materials were doing, without falling into traps of representation. However, as I tried to perform analysis I kept getting stuck, falling back to social constructivist habits of grounded theory and coding, and seeing emerging themes without paying attention to what theories I was thinking with in order to recognise these themes.

Making with

Bringing these qualitative and performative methodological moves together in a more new materialist way required an act of sense making that recognised the theories I was thinking with and that owned my active role in the research assemblage (Fox & Aldred 2015) without assuming my thinking was enacted alone (Haraway 2016). This active and performative re-imagining of my relationships to materials and conceptualization of material agency does not start and end with me. It is not the sort of sense making Sanders and Stappers (2014) refer to, in which anticipated impacts and futures are made sense of by design synthesis which, following Kolko (2010), is “performed privately ‘in the head’ or ‘on scratch paper’ ” (Kolko 2010, p. 16). While that process of abductive thinking results in insights that are ‘made sense of’ by a designer, what I am referring to is more of a sympoiesis (Haraway 2016). Meaning simply, making-with, it accepts ontologically that:

Nothing makes itself; nothing is really autopoietic or self-organising...earthlings are never alone. That is the radical implication of sympoiesis. Sympoiesis is a word proper to complex, dynamic, responsive, situated, historical systems. It is a word for worlding-with, in company. (ibid, p. 57).

This more evolutionary and collaborative process doesn’t seek to be self producing, rather, by blurring the boundaries between disciplines as well as boundaries around how thought is produced, this making-with is always already ongoing and has the potential for surprising change. Once this more-than-human and collaborative understanding of knowledge production was introduced to my understanding of not only analysis but knowledge production and existence, broader ways of analysing with the materials started to

seem like the natural move required of this research in order to not fall into representational traps and to stay epistemologically aligned with the new materialist theories I was thinking with. I explored various modes of thinking *with* materials. Some of these were more traditional, like using photos from the workshops to elicit responses during interviews, and creating storyboards from the photos to think through what was being documented, what was being left out, and what story was being told about the workshops in the reports that were written and sent back to participants. Some modes of analysing were more collaborative and intensive, like printing and curating photos from the workshops I conducted with XYX Lab and inviting the other members of the design team to workshop how we had been thinking of not only materials, but the potentials and pitfalls of co-design as an approach.⁴ The curation of images together, whether in a gallery space and discussed with others or just on an online whiteboard like Miro for my own thinking through, started to enable me to think differently.

Anarchiving

While in the midst of reading new materialist theory like Barad's (2007) idea of intra-action, or the way Lenz-Taguchi discusses the materiality that is active in early childhood education, I started revisiting the photos, and creating new combinations of photos through the lens of the theory. The visual practice of arranging photos, files of the materials, and even a few times audio and visual clips started doing the work of an 'anarchive' as a living and processual collection (SenseLab). Manning proposes this is not so much documentation as it is a lively technique that acts as "a feed-forward mechanism for lines of creative process, under continuing variation" (SenseLab n.d.). The value is in the process and the way it enables what Manning (2020) describes as 'thinking from the middle.' This is an intentional traversing between the more minor and overlooked qualities that are cast aside, and the generalisations that make abstract notions and processes more concrete which she describes as "generalisations [reifying] the monumentality of experience (be it in the name of politics, of pedagogy, of the family, to name just a few examples)" (Ibid, p. 6). This technique is increasingly used in design anthropology to engage with sensory and relational data that could not be attended to in a more traditional process. (Fritsch & Fritsch 2015).

For my research, the act of arrangement and anarchiving started to create a way into thinking with materials and moments that was more simpoetic than combing through survey results looking for themes. For example, combining moments of play from four different workshops I started recognizing similarities in the facilitation approaches that had set up these moments, and thinking about the differences between intrinsically motivated playful decisions, like a colleague imprinting and moulding playdough to her hand. This curation revealed the social nature of collaboration and competition, but also challenged my assumptions that individual activities were solitary, as I now saw the play now between people and materials, as well as parallel play as participants sitting next to each other working on their own models started imitating what neighbours had done.

⁴ Several short workshop sessions and conversations took place in the curated gallery and again later on using the photos. While data and outcomes from these activities are not directly referred to in this research, it informed many realisations about how I was thinking of co-design, participation, and what I was trying to do through my research so I would like to again thank the members of the XYX Lab for their time.

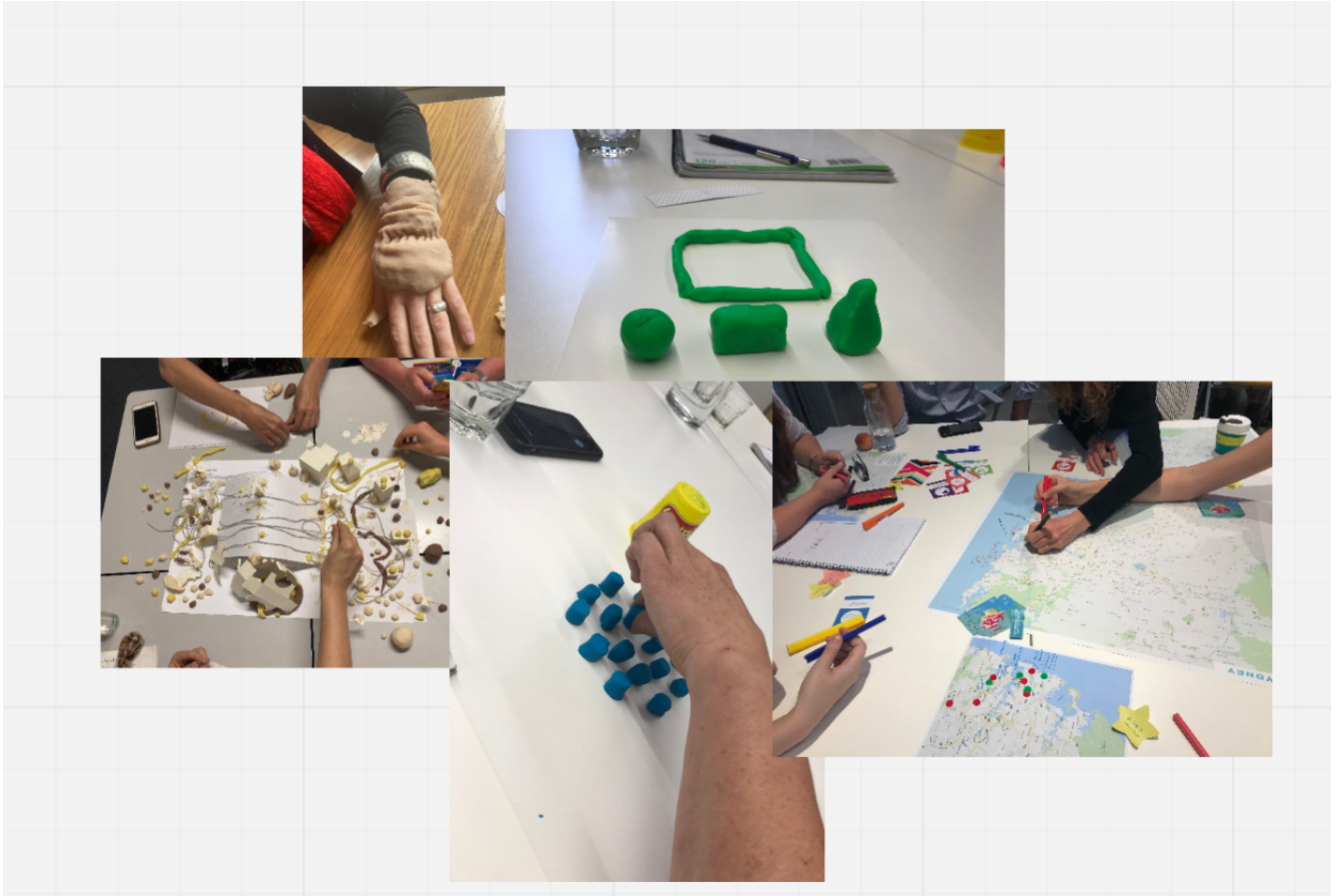


Figure 18. An example of an early anarchiving tracing approaches to play through cards and playdough

Beyond writing about what was coming up and coming to light in these arrangements, I started intentionally reading these collages through ideas about material agency and affectivity I was reading about. I realised this technique of anarchiving images and theory was changing my relationship and conception of the materials, and helping reframe the role of materials from tools people use to more active and important participants. This technique of writing was developed into the main mode of analysis, a practice of writing narratives about my experience with the visual documentation, data and materials from the workshops, and theories from new materialism.

2.4 Practice Narratives

In order to perform analysis in a way that did not flatten the event (Manning 2020) and that acknowledged my active role as a researcher, yet accounted for the assemblages of methods and theory (Fox and Aldred 2015), I adapted a technique of writing practice narratives that was being developed in the Wonderlab PhD cohort I was part of. Alongside fellow candidate Hannah Korsmeyer, the director of WonderLab, Lisa Grocott, and affect/performance studies scholar Stacy Holman-Jones, over the course of several intensives this mode of writing was piloted, critiqued, and refined. Also referred to as 'praxis narratives', for the way they can bring together theory and action through reflective writing, these are different to more typical discussion of outcomes and decision making. This technique is a way to attend to the tensions, shifts and contradictions in practice, and is a mode of writing that is relational, situated, and performative (discussed more next). This played a major role in allowing me to not only reflect upon design considerations and what happened in various workshops, but to re-analyse what I observed and experienced through different lenses of theory, results from surveys and interviews, as well as different collections of workshop images which enabled a way of analysing these workshops beyond my own individual reflection, and in ways that were commensurate with a post-qualitative approach.

This mode of writing was developed in the 2020 and 2021 intensive workshops, including a two week workshop I developed that included Miro boards to facilitate the sharing of writing and enable collaborative critique and the development of shared language regarding what these practice narratives were doing.⁵ The three guiding qualities are discussed next to help situate this mode of writing..

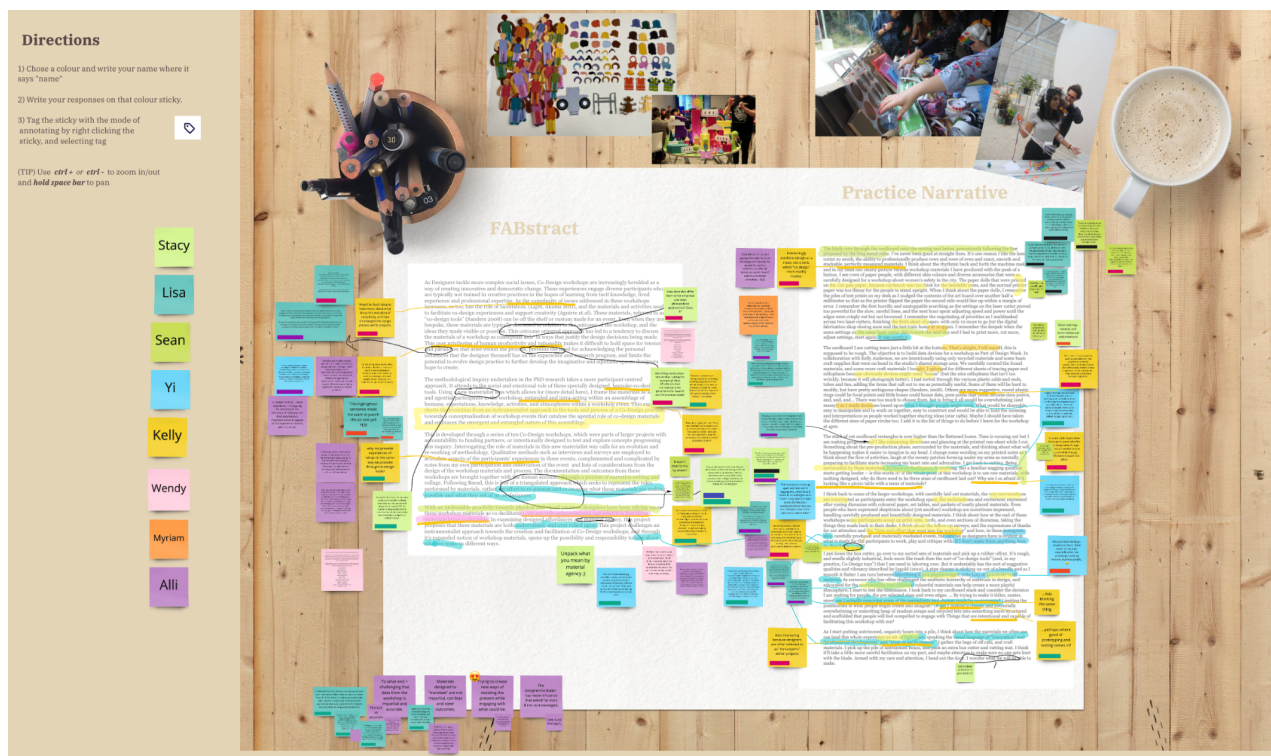


Figure 19. Miro oard with my example that was used to develop practice narratives.

⁵ So many Wonder-Labbers contributed to my understanding of what these narratives could do, (both for practitioners/researchers as well as readers) and I wish to thank everyone who took the time and energy to share their writing as well as help discuss what this mode of writing was/was not.

Relational

Firstly, the writing of the practice narratives seeks to be relational. While aspects of the writing were autoethnographic, as Holman Jones & Harris (2019) assert, this mode of writing can be political, relational, and very different from the “me-search” that autoethnographic writing is sometimes criticised for. Thinking with Judith Butler, they propose a queering of autoethnography that is concerned with material conditions, and is a relational practice, “one concerned with and responsible for creating a dialog with a community of ‘others,’ rather than a monologue in which a “single and unified subject declares its will” (Butler 2015, p. 156 in Holman Jones & Harris 2019, p. 7).

For my research, I adapted this focus on relationality to draw into focus different relationships between myself, materials, and other participants. The focus on how things come into being in relation to each other made moments of becoming clear. Such as recognising the moment people in a room become participants, or the moment I become facilitator in relation to people and materials. This quality of writing paralleled the new materialist conception that agency comes through ‘intra-action’ rather than individual capacities (Barad 2007), and helped me not analyse individual materials in isolation or artificially imply identities or capabilities are static and predefined.

Situated

Secondly, the writing in the practice narratives was *situated*, drawing upon experiences and grounded in details and affect. Some prompts used in the development of this writing drew upon Lynda Barry’s (2018) autoethnographic prompts from her book *What it is*. These prompts place the writer in the moment, and through their creative and visual evocations actually enact many of the philosophical challenges that Manning (2020) poses as she calls for methods of documentation or event traces that ‘feed forward,’ creating new lines of creative process, under continuing variation that enable new thoughts. Instead of seeking to be complete depictions of an event or objective accounts of what took place, these narratives ‘reactivate’ thoughts beyond remembering or documenting.

For my research, this situation forced me to move beyond my own recollection of what happened, beyond photo documentation and participant survey results or quotes from their feedback, and to instead re-attend to the events while applying different lenses of material agency. Despite working with data from qualitative methods, this way of writing started aligning with a post-qualitative epistemology as it attended more to what was becoming and how things in relation to each other were creating the conditions of possibility. Following a new materialist perspective, Cooper (2019) describes this as an enchanted writing, saying of this practice:

It suggests that writing is not an epistemic or even a socio-epistemic practice of interpreting the world but rather a behaviour of intra-acting in the world, not a behaviour dominantly driven by intentions or purposes but rather by responding to possibilities that arise through intra-actions, and finally not a behaviour governed by effectiveness or efficiency but rather by creativity and accountability. (Cooper 2019, p. 20).

Within this mode of writing I was able to write from my situated perspective and attend to how things felt, and what was affecting me, but also speculate, create connections and write into being, new relationships with materials and ways of thinking of their active role. In my research this was made possible by viewing the writing itself as meaning making: a negotiative and performative act.

Performative

The third aspiration for writing these accounts of practice was that they be dynamic and performative. Rather than explaining processes or outcomes, they needed to take on tensions and create space for interrogation, contradictions, and processual becoming. They were not complete but in motion. Rather than an argument, they had a rhizomatic prerogative and did not seek to settle on a solution or explanation. In this way it was the sort of writing Pollock (1998) describes in performative writing as ‘nervous,’ as it anxiously “crosses various stories, theories, texts, intertexts, and spheres of practice, unable to settle into a clear, linear course”; it operates by “synaptic relay, drawing one shared moment into another” (90-91). For my research, this gave not only permission but a necessity to unsettle what I thought I understood and to re-write in a way that animated the new materialist theories, and that enlivened the materials I was thinking and writing with.

Writing practice narratives, while linguistic, did not seek to be representational (St Pierre 2020), but enabled my research to involve qualitative methods while staying true to a post-qualitative and new materialist way of knowing. As Barad (2007) explains:

A performative understanding of discursive practices challenges the representationalist belief in the power of words to represent pre-existing things. Unlike representationalism, which positions us above or outside the world we allegedly merely reflect on, a performative account insists on understanding thinking, observing, and theorising as practises of engagement with, and as part of, the world in which we have our being. (Barad 2007, p. 132).

In the Wonderlab context, these practice narratives sought to be relational, situated and performative, and were a way for our cohort of PhD researchers and academics to account for the personal and emergent acts of designing that are so frequently left out of discussions of co-design workshops (Akama and Prendiville 2016). As a technique, it was flexible enough for me to adapt for my own research objectives. Written with the photographs and designed artefacts from the workshops, these practice narratives allowed me to create situated yet speculative accounts of practice that surfaced attentions and in-tensions and provided a site for re-interpreting moments in practice through a feminist new materialist lens. The writing of these accounts revealed ways in which workshop materials can be both undervalued and equivalently over-relied upon, and allowed me to attune to different dimensions of material agency that resulted in the framework which I shall discuss in the next section, Part Two. Excerpts from these Practice Narratives (PN) are included, formatted differently to differentiate the excerpts from the rest of this exegesis. Longer, edited versions are available at the exhibition website <https://www.alliedwards.com/practicenarratives>.

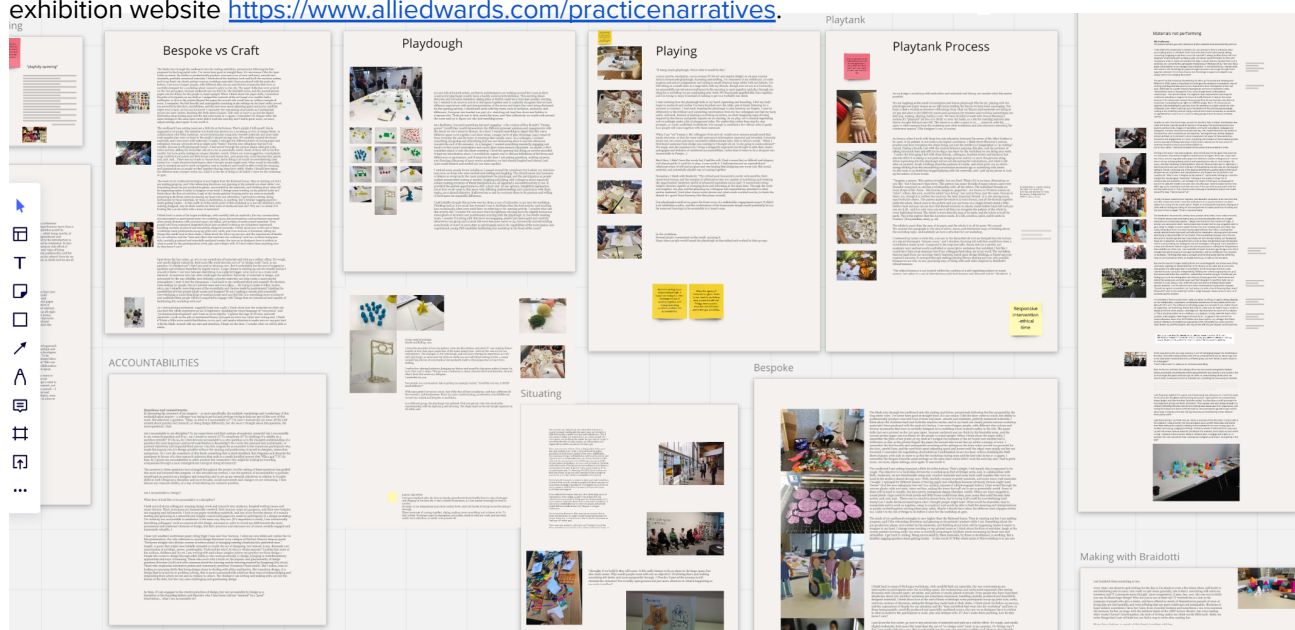


Figure 20. Examples of practice narratives written with images and theory in Miro

Part Two

In **Part One**, Chapter One I situated my practice amongst socially engaged co-design practises, and troubled the human centred obsession that discounts the active role materials play in these workshops. I introduced the onto-ethio-epistemological framing of this research, bringing Barad's (2007) agential realism as a frame through which to reconsider material agency. In Chapter Two I discussed the research positioning that expanded upon design oriented, practice-based research, by entangling it with new materialist and post qualitative accountabilities. I also discussed the methodological moves that let me follow the line of inquiry and ask "how can the role of co-design tools be reframed when entangled with feminist new materialist theories?" Part of this question specifically asked "how does feminist new materialism enable different ways of thinking about materials?"

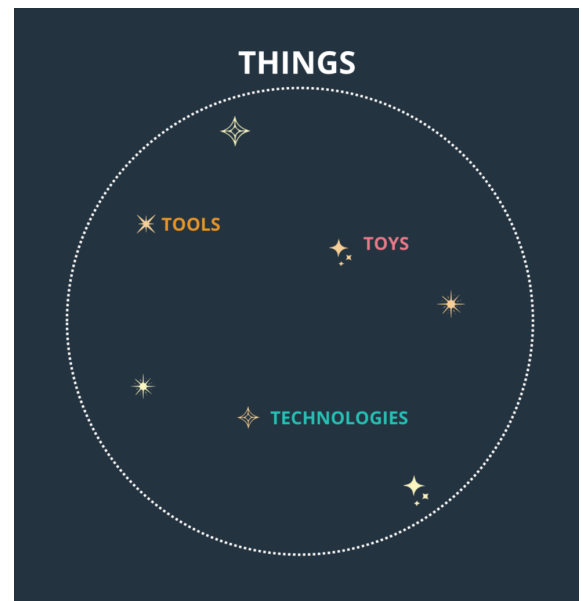
Now in **Part Two** I answer this question by proposing a conceptual framework for a new understanding of materials in co-design. Each chapter in this section includes a further discussion of co-design literature together with theory illustrated by excerpts from my own practice narratives - reflecting on the twelve workshops which make up the practice component of this study.

Part Three discusses the considerations for ongoing and future practice that are enabled by this re-framing of what co-design materials can do and mean, leading to the conclusions of my research.

3. Framing Co-Design materials as ‘Things’

In this section I discuss the unique contribution to knowledge that resulted from entangling feminist new materialist ontologies with my co-design practice. In order to re-frame the role played by co-design materials, specifically bespoke, custom-made ones, I propose a framework through which to consider material agency for co-designers. My first conceptual move is to frame these materials as ‘Things’ (Bennett 2010). This acknowledges them as agential and active, beyond designerly notions of affordances. In the following chapters I then propose three dimensions through which to consider the material agency of these co-design ‘things’ as ‘tools’, ‘toys’, and ‘technologies’ in Chapters Four, Five and Six respectively. This framework seeks to catalyse considerations for practice not be comprehensive, as pictured by the unlabeled points in figure 21.

Figure 21. Framing Co-design materials as ‘things’



Things

Within the new materialist conception of ‘things’, it is particularly the agentic capacity of materials that progresses consideration of what materials can do beyond designed affordances and a focus on translating human cognition. However, as discussed in ‘Entangling Feminist New Materialisms’ (1.3), the material agency of co-design materials is not afforded or necessarily pre-determined but emerges through a process of performative enactment and intra-action within an assemblage of socio-cultural and semiotic forces (Barad 2007, p. 11). This means that in practice, these materials’ agentic capacities depend upon socio-cultural factors, as well as material and political aspects of the workshop, some of which can be more or less forceful for different people. These intra-acting cultural and personal preferences or expectations may, to a degree, be accounted for but may also be unpredictable. While there may be a tendency for thoughtful design considerations to enable an intended condition, there can never be an assumption of the guaranteed outcome when in practice since these agentic relations develop in unpredictable ways around actions and events (Deleuze & Guattari, 1988). This section examines how material agency is granted through assemblages in order to counteract disciplinary fixation on how the materials are used. In addition to accounts from practice, several interviews with participants from workshop #8 are discussed to illustrate some of the key influencing factors that impacted how the materials could perform in these encounters.

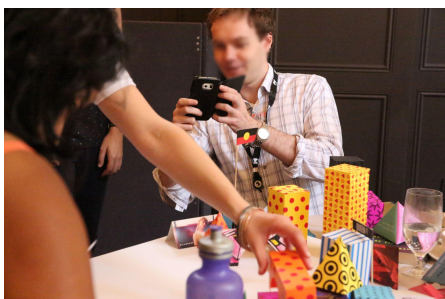


Figure 22. Participants photographing their work



Figure 23. A group video chats with workmates to show what they were making

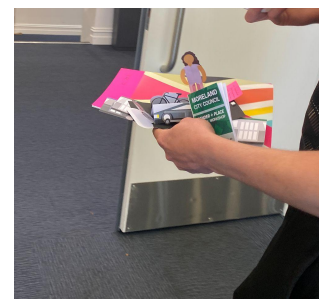


Figure 24. Participants take away more than intended

3.1 A Fixation on Materials

In every workshop, materials proved to be captivating, inviting, and important. As people walked through the doors, many would stop their conversations to exclaim and start discussing the materials on display (Workshops 3, 4, 5, 8). Frequently upon putting out the materials, attention was captivated, excitement or curiosity aroused, and the materials created a clear signal that participants were arriving in a different type of experience than the meetings and presentations that typically happened in these spaces. Often in the workshops participants photographed what they were doing, posting to personal and organisational social media accounts (See figure 22). A few times they even called colleagues to show them what they were doing, joking about people missing out (see figure 23). After the workshops had concluded participants sometimes asked for extra materials or templates to take back to their organisations, saying they were inspired and excited and wanted to try an activity we had done with their team, or use a certain material in an upcoming meeting. Several people even walked out with models they had made that were not intentionally designed to be takeaways (see figure 24). Upon running into people who had attended the workshops months and even years later, I would receive thanks and compliments on the materials, and many times heard comments about having never been to a workshop like that. Especially in larger scale design workshops, this captivation and excitement was an indication of success, achieved through attention to detail, high quality materials and production quality, large scale printing and beautifully designed and bespoke artefacts. As I paid attention to the materials I was not only designing but working with and facilitating with, I saw their agency, and ability to call and captivate.

From the moment they sat down, people would often play with and examine the materials, almost like they were drawn to them. Even as people made small talk at their tables and waited for the workshop to start, playdough was squished, cards were shuffled and paper elements were examined, often becoming the topic of the conversation. This common occurrence at the introduction of designed materials is commented upon but not explained in Gaver et. al's (1999) description of people encountering design probes. The tendency of people to start fiddling and exploring the material on their table upon sitting down, not to mention their inability to stop touching the materials even after being directed to leave the materials alone until after the delivery of instructions, was reminiscent of Barad's performative agents (2007). Instead of people entering a room and sitting as an audience, or as workers at their desk, people performed as participants in response to the invitation of the materials on their table. Lenz Taguchi (2011) adopts a similar perspective and goes so far as to suggest the loudness of material invitation can overpower human facilitation. In a discussion about the allure of buttons being used in a maths demonstration for school children, Lenz Taguchi (2011, p. 42) explains:

They practically scream out, 'Sort me!' 'Put me into piles!' In the interconnections and in the affective relations that emerge in between the children's eyes and hands, the agentic force of the shape and colour of the buttons is much stronger than the force of the teacher's words and request to do division. Although the teacher thinks that she has planned and structured the event in order to have the children respond correctly to her request, the pedagogical space is not ordered, or striated, rigidly enough to make the children follow these stratifying and ordering (molar) lines, to use the language of Deleuze & Guattari (1987).

In this account, these materials were at times co-opting and dominating the experience and competing for attention, but as a designer facilitating these experiences, it was exactly this loudness and vibrancy I relied upon. Especially when facilitating by myself or in smaller spaces without a more traditional set up of tables, and chairs, it was when I held up or could display my pre-made materials that I gained a sense of confidence and an air of legitimacy. As a designer, this is what I felt I offered to this space and brought to an experience, using my expertise as a designer to craft an event that stood out from other discussion based activities. When my words failed me, or my directions were too vague, I knew people would figure it out as a group and the materials could help facilitate the experience.

This became especially evident after re-reading practice narratives such as in this excerpt from workshop #6, 'Building the future of the Ally Network' at Curtin University in 2018. The Ally Network is a loose and nebulous group of academics and practitioners committed to social justice and equal rights for LGBTQI+ people that in addition to supporting students and community, host a biannual conference. This workshop was requested by the organisers of the conference to invite volunteers to share their hopes for the future of a more connected Ally Network. In planning how members might articulate their actions, and visualise connections, I adapted foldable paper tetrahedrons I had used before to help guide the introductions, and envisioned paper building blocks being used to craft a material metaphor of what our current network was supporting and how it could be built up. Equally committed to informal networking and information gathering, the 90 minute workshop was open to everyone who stopped by and took place in the atrium outside of the lecture hall right after a break. Due to the lack of pre registration I had no way of knowing who was signed up to attend, and unfortunately it did not have the typical set up of multiple tables and chairs or designated workshop space, just a fold out table amidst the vendors and trade show booths.

The excerpt from a practice narrative is written below, and throughout this document using a different format.

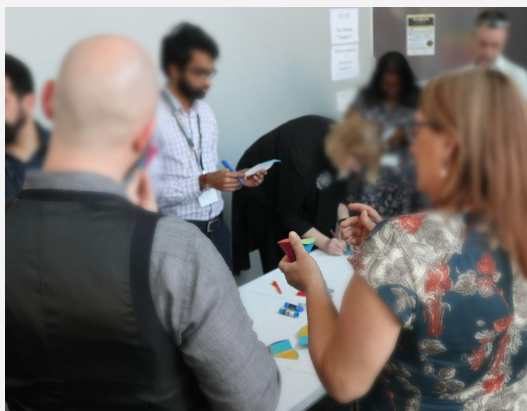


Figure 25. Participants making tetrahedrons

I am not sure how I am supposed to host a workshop with one table, a few chairs, and no idea of who is volunteering to join this session. Surveying the conference attendees, vendors, and colleagues milling around and catching up– I'm struck by how much I miss having a space to set up. Mentally rehearsing and running through the instructions I'll be giving as I go around the room placing materials at tables and checking my list isn't just the work of a good hostess, but a way of arriving in the space and stepping into this role.

Picking up one of the lasercut tetrahedrons, I push aside my feelings of disappointment, trepidation, and unpreparedness, and take a breath. "Who is here to imagine an Ally Network?" I spruik while holding up a colourful triangle that visually signals "workshop." Standing in the middle of a foyer full of professionals and academics, I am no longer the subject of their gaze, as people gather around the table with markers and pens and colourful paper. Several people mention they didn't know there was a workshop and they aren't sure if they can stick around, but it looks fun and they want to join in. They receive a smile and a paper tetrahedron and join the cluster around the table. There is now an "us."

I briefly introduce myself and our objective, joke about the constraints of the space and offer to try to find more chairs. Then I introduce the paper shape I was holding as an activity to get to know each other and what we do as allies. I always look forward to that moment of magic, of wonder, and amusement when I demonstrate how the tabs (on which participants will be writing what supports their actions as allies) is also the support that holds the pyramid together with no tape or glue; designed to delight. As some people finished, they started showing each other what they made, joking about how some were staying together better than others. As I come around to see if anyone needs help I am happy to see several people helping each other with the folding. I felt a loosening in my shoulders at the low hum of activity and the sound of pen on paper. Now this feels like a workshop.

(Excerpt from a practice narrative (PN) about workshop #6)

As a designer, I had intended that the colourful laser cut templates and markers would signal, in their own way, that a particular type of activity and way of working is about to occur. Whether in a well planned space with seating arrangements and kits at each table, or standing in an atrium in the middle of a conference break, I saw people coming together and engaging in conversation as they started making. I saw the materials as central to this experience and agentic in their ability to invite engagement, to enable collaboration and to co-facilitate workshops experiences. Yet, as I reviewed practice narratives I had written about various workshops I started to see more clearly that this was not just an appreciation of material agency; but a fixation

that was linked to my identity and background as a designer. To only describe people engaged in various ways with materials and describe that as agency is to fall prey to a disciplinary narrowness, what Björgvinsson et al (2012) criticise as design's obsession with 'things' (objects) rather than an acknowledgement of 'Things' as socio-material assemblages. It also runs the risk of misinterpreting the project of new materialism, in which agency is not prescribed, but rather enacted relationally and processually (Whitehead 1978) and seen as intra-active and evidenced through phenomenon not individuals (Barad 2007; 2011). In framing material agency, it became important to not only look for what these co-design things were doing, but to also broaden my attunement to the assemblages they are taking part within as material-affective-semiotic entanglements (Osgood and Guigni 2015, p.349).

3.2 Things in Assemblages

Anyone who has felt the excitement at a beautifully bespoke set of materials, an impulse to plan strategically at the introduction of a road map or experienced an expanded sense of relationality and responsibility when in nature knows that the materials we think with matter. To presume that we humans are alone agential in these assemblages is arrogance and would be a lonely mode of collaboration indeed. In describing the vitality and indeed agency that nonhuman actors exhibit Jane Bennet explains,

...no one materiality or type of material has sufficient competence to determine consistently the trajectory or impact of the group. The effects generated by an assemblage are, rather, emergent properties, emergent in that their ability to make something happen...is distinct from the sum of the vital force of each materiality considered alone (2010, p. 24).

Thought of in this way, the physical materials, tools and toys we use in these workshops are able to perform in certain ways in certain conditions. A paper triangle sitting alone on a desk might not have the ability to hold the attention of a room, or spark conversations between strangers. But, when introduced as a way to get to know each other and show connections, this same material becomes charged with potential: active in the thinking, introductions, and shifting the people in the workshop towards becoming engaged participants.

Thought of in another way, this means my own agency in a given assemblage is enhanced or diminished by the factors in the assemblage, and by the vitality of the materials available to think with, to inspire others, and to become facilitator with. Just as much as it is my instruction and the framing of expectations in a workshop that catalyse the paper triangle into an icebreaker, and the willingness of people to engage and participate that create an artefact imbued with meaning—it is also the paper triangle I hold up that steadies my voice and creates a reason for noisy humans to pay attention, as together the materials and I become co-facilitators.

Following this DeleuzoGuattarian view of becoming, rather than static stable identities, and assemblages as being able to bring elements together affectively to do something or to produce something (Fox et al 2007), the focus shifts from designed affordances and individual interactions, to what the materials are actively doing in relation to other elements in the workshop assemblage. This way of situating material agency is common throughout new materialist descriptions of encounters. In the discussion of material agency exhibited by the buttons with children from earlier (see page 28), Taguchi is careful to not claim this 'loudness' is an inherent property of the buttons. It is more than an affordance of their colour, or shape, more than the excitability that is generated through their novelty. Following Barad (2007) and new materialist conceptions of agency, she situated the beads' disruption in relation to cultural, material and discursive factors at play. While framing materials as 'things' allows attention to agency, it also becomes necessary to see what else was making up this experience.

To learn more about whether the materials were in fact as important as I was observing, I distributed a brief survey after several workshops (3, 4, 8, 10) asking explicitly 'what most stood out' to participants. For these workshops, the top results were either explicitly the designed materials or the engagement in interactive activities (which were all in some way materially mediated and relied upon bespoke materials). Participants

listed aspects of the workshop like the overall topic, the facilitation and set up of the room, and the other people in their groups as factors that stood out, but overall the materials were discussed the most. Even trying to set aside my disciplinary predisposition to attend to the materials and artefacts, they were what people described as ‘standing out’ the most. To some extent this was already influenced by the materially rich approach to creating workshops. For instance, in a workshop built around acting out dialogues the card with a script on it might not be seen as influential as the scripts or interaction switch other people. However, in these surveys, different aspects of the making activities stood out to different people, and not all of these were positive.

3.3 Understanding Intra-acting Factors

It wasn’t until after workshop #8 with Moreland City Council, where five participants agreed to follow-up interviews, so that I was able to dig deeper and create a more nuanced picture of the various assemblages at play. Supporting my line of inquiry, people discussed the materials in ways that went beyond recognition of engagement or even making ideas visible. When asked about their experience, every participant recalled the materials and the modelling activities but tended to want to share more about the context and other elements which often appeared even more important to the participant. In conducting the thematic analysis of the interviews, I discovered that each participant had their own unique relationship to the materials, often manifesting in assemblages with factors we as designers had little awareness of or even control over.

For example, when I asked ‘R’, a woman who worked across several departments in the Council, about her experience of the workshop in general she was more interested in talking about the people in the room, and how they had been invited or selected than about the activities. Some of her key observations about the workshop were about how the time and obvious planning and resources spent on a workshop of this calibre obviously meant the Council cared about the issue that the workshop had explored: taking gender into account in decision making. She shared that her “biggest aha moment” had been in the last activity, where little booklets with reflection prompts and visual metaphors of different types of lenses had invited consideration and the planning of next steps to develop and apply a personal gender lens. She described a process of realising that in relation to others at her organisation, her gender lens is quite bold, saying:

And so maybe in order to change or create effects for me, doing that exercise helped me to realise that I might need to not change my approach or my views or, you know, what I feel and believe– but maybe target the audience a little bit better in the way that I deliver my very passionate, strong, ‘how dare you, you misogynist’ message. [laughter] Because I’m not shy, you see, and that’s quite problematic.

She described the value of the booklet activity and how she has kept what she made on her desk. However, when questioned about the materials that enabled these activities, she explained that while she likes the idea of craft, she felt it took a bit of the seriousness out of the issues. She elaborated:

I feel that these [points to pictures of the paper buildings] the fiddly stuff, the exercises were a little bit too distracting. But for those of us, and I do put myself in that camp, I mean, I like doing arts and crafts and stuff like that. And I do it when my kids, I have three of them. And, you know, I’m very into it at home. I felt that it did take a little bit of the seriousness out of what I consider to be some very fundamental human rights issues that are happening. And whilst I appreciate the motivation around getting people to work together and talk about this work together, I felt that maybe it was a little bit distracting for me from what we were trying to do. So the discussions about how to create a light pole wasn’t about why light is important or not important. You know, it was, let’s use these. Now let’s use that. Now let’s. What about this sparkly thing?

As we discussed this further, she alleged that because this was hosted at their workplace and people already knew each other, they should already act with collegiality and be willing to engage. She saw the time it took to

negotiate as a group *how* to create the models as a distraction from *what* they were proposing. To her, this issue was already critical, and people should be working together to tackle it. While the workshop was overall “a positive experience”, she saw the “craft supplies,” as well as the coffee cart and the ice breaker activity at the beginning of the day as distractions and possibly unnecessary, even inappropriate in a work environment.



Figure 26. Gender Lens booklet described by participant R from workshop 8



Figure 27. Warm-up activity where participants had to follow the secret rules on their card, workshop 8

3.4 A Different Assemblage

However, it was the same icebreaker and coffee cart that were mentioned as stand out features by participant “E.” She had only been working at the Council for six months, so she still didn’t know too many people present. She described how the coffee cart signalled a collaborative and exciting atmosphere, despite being at work, and how she appreciated that the ice breaker provided a way to introduce herself and meet people. When asked about highlights, this participant also described, *“The creative elements of the workshop for me were a real highlight. So actually having, you know, having all of the paper buildings and trains and bikes and people to play with and to be able to use that as a tool to try to think through some of the concepts that we were talking about are really, really valuable.”* She went on to describe how the mix of activities kept her and her table interested and engaged, and elaborated upon the importance of having movable elements:

So, you know, if he's drawing something it's a bit harder to keep scribbling over the top and moving things around. And not everyone feels comfortable with that. Whereas I felt like with this, everyone felt comfortable kind of grabbing something and putting it down on our little map that we'd made here, which became a raised roundabout in the end. But it just meant that we could all have a go at explaining our ideas and our solutions and keep moving those elements around feeling like we could do that. You know, I thought it was a really clever way to do it. I think people felt genuinely excited about the materials that were there and like a lot of thought had gone into them. So, yeah, I think that's part of the creative element was great in one raising enthusiasm, but two also creating a non-threatening way for people to contribute and to kind of explore and share and create solutions together.

E viewed this non-threatening and exciting mode of engaging as the main reason everyone participated and contributed. She described another workshop she had been to where the facilitator gave them a printed map, then some people started drawing lines for infrastructure, which she felt limited the ways to contribute and the options the group could propose. Especially in this workshop at the City Council with people from different backgrounds and areas of expertise, there wasn’t just one way of proposing things. She described feeling able to challenge the group’s initial plan to mark out the infrastructure side of things when she moved in a

figure of a child and started asking more about different types of use. The materials, described as finicky by participant R, were the main feature of the workshop and the reason her group came up with what E viewed as shared and useful ideas and understandings. This flexibility of approaches and materially mediated activities, however, were a challenge to others. Apart from being described as “finicky” and distracting by participant R, they actually proved to be a barrier to participation for an older man who had been an engineer at the Council for most of his career and was now nearing retirement.

3.5 A Difficult Assemblage

For some participants, however, the assemblage of past experiences, attitudes about the issue and relationships with others in the organisation was not catalysed by the materials. Participant C described an initial gut feeling of wanting to walk out during the ice-breaker activity, thinking that the workshop had little to do with his job and that his time would be better spent at his desk working. He stayed out of a sense of duty and found he could contribute even though the topic was different to what he thought would be important when considering transportation. He described how his table was evidently getting a lot out of the activity and enjoying themselves, however:

C: The only lack of full participation, I think, was –I was probably the least participative of the actual physical, you know, doing things. They'd say, 'Oh [C] you can do this'... At least I got something to do. I'm not very good at imagination when it comes to these things. You know, my kids have all [the] imagination. I have nothing.

Alli: Why do you say that?

C: I'm an engineer, I work in straight lines and the more artistic and this sort of thing, that part of my brain was never developed.

He described that while his group was able to discuss the different versions of the scenarios, he was happy just to make what they suggested since he expected to bring his knowledge of dimension and road widths to bear. Because of the materials, he felt this was a “different sort of thing.” Despite not taking a leading role in proposing ideas, he described how the feedback from different people was eye-opening. Describing the conversations that were happening over the modelling activity C shared, “*That is the biggest thing I got out of the whole day. It's about seeking advice because I know that I will not be able to see the issues from the other gender.*” Throughout the interview, he described the icebreaker as making him want to leave and the material making as something he was not creative enough to contribute to. However, as he started sharing more about what he did take away from the day he had some realisations:

C: “I have to...at least make sure that whatever I do has that gender view, which I wasn't aware of before.”

Alli: Hmmm. If I asked you to just kind of speculate. What do you think it was about this workshop that helped you realise that?

C: Okay. I hate to say it, in fact, I detest saying this, but it was the meet and greet exercise.

Alli: Really?

C: Yeah.

Alli: Yeah. Okay?

C: Because not only did it teach about different cultures, but ... as the day progressed, I realised this was also about gender. So, yeah. I learned it [differences about how people are socially scripted to act] about culture first and then as we worked down through the agenda, the gender issues, I realise actually this is a gender issue. So yeah, I learned that. And then later I learned actually, it's applicable to this. So in that respect, I guess it was well designed.

For participant C, engaging in the activities was counterintuitive and he would have preferred not to take part in the ice breaker. Yet, he begrudgingly realised the impact of the day was perhaps due to the scaffolded approaches and engagement in the activities. The icebreaker helped him start thinking about differences between cultures, which he then brought to thinking about gender differences in his group. He then reflected

further through the gender lens booklet (which he had kept). He shared that while he had talked to his team about these issues, he feels like the doing of the workshop had the most impact since for him, as he said smiling, “It was the hard work that got it into me.” This hard work was evidenced in his engagement and his personal realisations born from active learning; an experience that was enabled by the presence of the materials intra-acting to shape how people at his table engaged, which encouraged feedback from others and allowed him to experience a way of looking at urban issues through a gender lens that he otherwise would have not have engaged with or felt the same about.



Figure 28. Model making activity from workshop #8



Figure 29. Constructing paper people in workshop #8

3.6 Effects of Assemblages, Beyond Engagement

The materials used in this design engagement were an active and key component in each participant’s experience, but what they were able to do or not do was in relation to background assumptions, preferences for working, creative comfortability, and their relation to the topic. The idea that different people will engage differently with designed materials is not a novel concept. However, we can see that while the materials were acting differently for different people, they were still agential and acting in ways beyond helping to problem solve or make information visible. Even though participant C found them difficult to engage with due to a self-described lack of creativity, they provided concrete examples and a way for the group to work together and discuss various ways of enabling safer spaces. It was ultimately this exposure to different perspectives and participation in the structure of the day that enabled his personal insight that gender was more important to his work than he had previously been aware of.

While Participant R acknowledged the way the materials and activities encouraged people to work together and engage, she felt they were less appropriate for such an important issue. She saw the activities as unnecessary since in the workplace everyone knows each other and should be on board with the importance of this issue. This was a view shared by several women who reported they appreciated the research and presentation about the current issues but had expected more examples of what other Councils were doing and wanted more concrete solutions. Multiple survey responses called for more time for discussion within their groups, referred to the material components as “craft,” and one even called for “less games.” At the same time, participant E felt the hands-on making and modelling were a highlight of her experience and the main reason the group collaborated so well; putting her more at ease working with people she didn’t know and feeling like she could add her perspective and interests by moving around the paper elements. This was a view shared by many people who returned the end survey, saying that the modelling activity stood out to them and overall “the format made it really easy to actively participate.” (end survey response from workshop 8). Beyond their personal use of the materials, the ways of engaging and working as a group made discussions and sharing of opinions possible in a way that previous meetings about gender policies had not (participant N).

Participants C and R agreed it was impressive to see a workshop about this topic that was this well done, and carefully designed, and that it indicated that their Council was taking this issue seriously. This was mirrored in several survey comments, describing the workshop as “well structured” “well designed and organised”,

“impressive”, “exceptional” and saying that it was “worth participating in.” (end survey response from workshop 8). The high quality and professional delivery of such designed materials indicated the value and importance of the topic. For participant E she valued the time to discuss and work with others and felt like she would be more comfortable talking to members of the Council about gender-related issues knowing that many people had been to this workshop and this Council was actively considering issues of gender, safety and inclusion.

3.7 Implications of ‘Things’

It would be easy to dismiss these varying receptions of the materials by looking at differences in learning styles and matters of taste and preferences. But that typical analysis of how a user responds to a designed artefact privileges a rational and intentional use of objects by people and falls into the trap of passive, inactive materials. By shifting attention from how materials are used to instead consider how these materials act as ‘Things’ within an assemblage, several approaches become possible and in fact necessary.

Firstly, considering ‘things’ as gaining agency through assemblages and not as an inherent property, or even necessarily a designed affordance, makes the actions and influences of the designer legible in a broader and less human-centred manner. Coole (2005) Discusses how, in this more flattened ontology, what impacts the agency and capability of things can range from trans-personal, personal, and pre-personal factors, such as beliefs and mindsets and precognitive impulses. The implications of framing co-design materials as agential things is elaborated upon further in the discussion section 7.1 ‘Designing with assemblages of things.’ These following implications, however, are necessary to understand the framework, which I will further elaborate upon in this section.

Beyond considering the intent behind the design of materials used in co-design workshops, and the activities and structure, this self-recognition and ownership of our influences allows designers to “be accountable for what we build,” (Suchman 2002), as we shift from designing objects to designing such entangled and emergent experiences. This legibility also helps to articulate and own how we are facilitating and acting in these projects and bringing together of people and materials (Light and Akama 2012). Beyond the increasing demand for designers to acknowledge the idiosyncratic way participatory methods are enacted, (ibid) and to pay attention to how we are “showing up” in the process (Agid and Chen 2019), this conceptual re-framing from tools to ‘Things’ brings the designer, materials and participants into closer relation, and distributes agency amongst them more evenly. This attention to how the designer is showing up suggests that the personal enactment of facilitation is an important factor contributing to what these materials make possible and the role they play within a workshop. Personal differences, facilitation styles, and ways of exercising control or responding to emergence matter just as much as materials and participants in creating a shared experience and considering the outcomes of these design engagements.

Secondly, once implicated in the assemblage and not above it, designers can attend to less obvious elements of the workshop assemblage that might go unnoticed or accounted for when thinking of materials as tools, or even as co-facilitators to guide the activity. As the past experiences, attitudes and relationships between people in the room become entangled with organisational objectives and expectations for the day, a different approach to the design, communication about the workshop and facilitation itself can emerge. This attention expands what is in our disciplinary attention from objects to intra-actions and becomings, enacting the shift called for by Bjögvinnsson et al (2012) to pay less attention to the objects being designed and more attention to the socio material assemblages designers are working within. Within this assemblage thinking, there are infinite combinations and ever-emerging influencing factors that will determine how the participants and materials perform. Determining the most influential elements and the forces at work between them was not initially part of this research question, although attention to the intra-actions has assisted in doing the conceptual work of reframing how materials go beyond functioning as tools. Assemblage thinking also helped avoid the essentialisation of these materials since there are no pre-existing actors or agents (Suchman 2000).

Some of these intra-acting factors specifically evidenced through this research that suggests implications for designers are discussed more in Chapter 7 'Considerations for practice'.

Thirdly, within this more expanded view of material agentic potential, there are multiple perspectives and angles through which to consider the role materials play once framed as 'things.' Material agency is always-already enabled or constrained and is evident in ways that are unique and emergent, resulting from the inherently unpredictable nature of assemblages (Deleuze and Guattari 1988), including those that participants bring with them to their encounter with co-design materials. This means that the agentic potential of a given material is never stable or complete, and no framework could adequately cover all the possibilities. The purpose of this research project was not to define the agentic potential of various materials, but rather to use the new materialist conception of agency to re-frame the role played by materials in co-design encounters. Therefore, I use 'Things' as a concept that positions this proposed framework while always acknowledging that any separation of the materials from their assemblages is an artificial distinction.

3.8 Un-framing a Framework

Attempts to constrain and predict what role might be played by co-design workshop materials would run counter to Bennet's proposition that 'Things' viewed as vibrant matter can act as "quasi agents or forces with trajectories, propensities, or tendencies of their own." (2010, p. 8). As previously discussed, the way materials act and what they make possible or constrain within a workshop results from many factors coming into relation, which means that predetermined affordances will not always have the same effect. Re-framing co-design 'tools' as 'things' is a conceptual move that holds space for this unpredictability and vitality, but runs the risk of abandoning design intent in the name of emergence. The three dimensions proposed by tools, toys, and technologies, which I will explain next, provide a way into thinking and making with this expanded notion of material agency. These are presented as dimensions that loosely and temporarily territorialise effects and actions to work towards a framework that is useful as a practical and pedagogic device and can connect design and research practices (Sanders, Brandt and Binder 2010).

To avoid the risk of separating the materiality from the technique in which it is used (Light and Akama 2012) or the assemblage it is acting within, I have chosen not to separate out or classify certain types of materiality (for example, paper or cardboard, two-dimensional worksheets or three-dimensional building blocks). Instead, my goal in proposing dimensions is to offer ways of designing with these co-design materials that challenge views of co-design materials as neutral, passive, or only for problem-solving. This re-framing of co-design tools ultimately moves design closer to tackling the challenges of our times in affirming and productive ways (Braidotti 2019) by paying attention to the more affective qualities and considering what these materials might be making possible for people and for projects. The following dimensions I propose are grounded in theories from new materialist understandings and then elaborated upon using specific examples from practice.

In Summary

In this chapter, I re-framed co-design tools as 'things' drawing upon new materialist notions of agency and Jane Bennet's concept of 'vital materialism.' This re-framing draws the designer/facilitator/researcher into the assemblage; broadens attention to other elements at play in a workshop assemblage beyond what was designed, and helps designers move from designing objects to designing 'things' that are active parts of socio-material assemblages (Björgvinsson et al 2012). As a result of this positioning, it becomes possible to re-imagine the roles materials play in co-design workshops beyond acting as mere problem-solving tools. The next chapter proposes three dimensions through which to consider material agency within a co-design workshop, as tools, toys and technologies.

4. Tools

In the previous chapter, I re-framed co-design materials as ‘Things’ to grant agency to the materials while acknowledging their dependence, influence, and intra-actions with other aspects of the workshop assemblage. This positioning allows further exploration into material agency while avoiding prescriptive or definitive claims, as the socio-material assemblage may catalyse or inhibit material agency, according to expectations and attitudes participants bring with them, organisational norms, physical and environmental factors, and personal facilitation styles. In the face of this expanded conception of workshops as assemblages and materials as ‘Things,’ it could be tempting to surrender design intent in the name of emergence and unpredictable intra-action. To counter this almost nihilistic giving-up of designerly expertise, I argue instead that this re-framing allows for interrogating and even re-imagining the job of a designer, and the roles played by materials in co-design encounters. This chapter proposes three dimensions through which designers might consider co-design materials when situated through this re-framing of active and agential ‘things’.

4.1 Potentialities for Tools

In proposing the dimension ‘tools,’ I recognise the utility that these co-design materials can have as cognitive and visual aids in service to problem-solving. Because so much co-design literature positions these materials as neutral intermediaries which allow people to make knowledge visual and tangible but are ‘inert,’ transporting meaning without transformation (Morris 2015) I propose an understanding of tools that is enlivened by a relational materialist ontology. This draws upon Barad’s challenge of the Cartesian dichotomy of mind and body in which humans are framed as active and intentional while matter is viewed as passive (Barad 2007; Lenz Taguchi 2013; Alaimo & Hekman 2008.)⁶ Framing ‘tools’ in this way invites designerly attention to the ways in which co-design materials actively invite and situate participants, and create not only solutions but also the framing of the problems posed. In the next section discussing ‘Toys’ I explicitly challenge the neoliberal framing of design as merely problem-solving. However, following Rogoff’s call to challenge institutions and conventions from within their own workings rather than in direct opposition (2019), I take this opportunity to re-orient our understanding of tools through this dimension in a less instrumentalised yet still pragmatic way.

The overall introduction examined how materials are discussed in co-design literature (section 1.2), and revealed a tendency for the descriptions of workshops to flatten the process, focus on outcomes and not evaluate the participants’ experiences or interrogate what was being made possible beyond what was being designed. This attention to the object-being-produced not only fails to attend to the human participants’ experience (Bowen et al. 2013) but also overlooks the influence and agency of materials involved. This view is most notably visible in Sanders and Stappers’ commonly cited book *Convivial Toolbox*, in which they frame a tool as “a physical thing that is used as a means to an end” (2012: 65). They discuss co-design materials as generative and high in experiential qualities, yet do not interrogate their materials’ role beyond surfacing tacit knowledge and assisting people in solving problems. I suggest they set a precedent, perhaps even an expectation, that the primary concern of a designer is how they design materials to help participants visualise knowledge in order to inform and inspire the design development team. This results in attention to how people are thinking *through* the materials as tools to get to an outcome and prevents attunement to the ways thinking *with* materials can change not only the problem framing and potential ideas, but the creative abilities of the participants as well.

⁶ Heidegger’s Tool analysis is a phenomenological inquiry into the nature of existence. I am more interested in what co-design materials framed as tools are doing and what is being made possible, and less philosophically concerned with what they are, hence, thinking with Feminist New Materialists to re-frame tools in way that progresses my research question.

4.2 Thinking *Through*, Becoming *With*

Following my training in design, I previously considered workshops to exist in service to problem-solving. As material mediational tools (Lahti et al. 2016), designed artefacts and prototyping materials are recognised for the cognitive benefits and increased ease of communication as thinking through material mediation “allows difficult and elaborate reasoning tasks to be distributed into the physical environment” (Katić et al. 2009). While Lahti and Katić are mostly discussing a mode of thinking through making that requires disciplinary expertise, they do acknowledge that the available materials will impact the design outcomes, and by extension, the approach to problem-solving. To take this argument further, I examine how, in thinking with materials as active co-creators, the materials of a workshop are not only framing problems but also how participants are thinking and making to address those problems. Ideas of thinking through making as opposed to thinking *with* and even *becoming with* materials were initially surfaced through my own participation in and observations of workshops. Such an observation is described in the practice narrative below from Melbourne Design Week, re-imagining data in creative practice (workshop #7).



Figure 30. Group's enactment of the “Pride crown tactile motivator” which collects data about achieved goals and dreams and manifests as a crown or a physically sharp spiky object when aspirations are not fulfilled

I expected there to be some difficulty working through our prompt with these given materials and worried at the participants' ability to manipulate these recycled elements enough to express the groups' ideas. I even bought the transparent sheets and paper and markers and other more commonly used materials that would be able to sort of bend to the maker's will, unlike these unruly tubes and strange foam textures. What I had not expected, though, was the joyful interrogation and a constant flow of new ideas I saw as a group of three leaned over the orange plastic off cut, counting rows, threading a string through it and figuring out what each row could stand for. One woman excitedly exclaimed, “We hadn't even thought of dreams!” as they filled in and labelled the fourth row. Instead of fitting the material to their agreed-upon ideas or previous conceptions formed after we gave them their assignment to build a data contraption, they were thinking *with* the materials. They had adapted their concept (in an unarguably creative and novel way) and continued picking up the very materials that I had seen as obstinate and perhaps un-usable. As they wondered aloud about what it could be, and how their contraption could work, they further pushed the framing of data devices that we had introduced. (Excerpt from PN about Workshop #7)

Following a new materialist ethico-onto-epistem-ology, we can look at the way materials co-constructed the problem framing by considering Barad's material-discursive proposition of intra-actions. This interrogation of matter and meaning posits that “Neither has privileged status in determining the other. Neither is articulated or articulable in the absence of the other; matter and meaning are mutually articulated” (Barad 2007, p. 152). This is different from the way many designers discuss materials⁷, since even the descriptions of making that acknowledge the active roles played by materials tend to focus on human inscribed meaning (Katić et al 2009; Sanders and Stappers 2012) and engagement with the materials in service to creating outcomes (Broadley et al 2017). This understanding of intra-actions makes possible a perspective that is less of a *thinking through* and more of a *becoming with* materials. In her accounts of learning, Taguchi takes a similar approach in challenging descriptions which relegate physical things to a passive backdrop or stage for the active human

⁷ Again, with expectation of designers who take up arguments from ANT or are more informed by arts and anthropology such as Roth et al 2017 who follows Tim Ingold (2013) but these scholars are often discussing creative practitioners, or students.

subject. This is something many discussions of co-design workshops are guilty of, following Design's preoccupation with human thinking and making. Hultman & Lenz Taguchi, (2010) instead proposes an alternative to accounts of materials in use and at play:

When the girl engages instead with other materials in the sandbox, or, for instance, with the climbing frame, she will form a new assemblage in her encounter and inter-relations with it. Her body and subjectivity become multiple (Mol, 2002). She becomes different in herself in each inter-relation that she partakes in and forms an assemblage with. *Different kinds of matter make her competent in different ways*. She becomes a confidently climbing girl only because she has the opportunity to form an assemblage with the climbing frame. Without the frame she would not be able to become such a girl. (p. 37 emphasis added).

By shifting the emphasis from how things are used, for example, as part of a path of expression (Sanders and Stappers 2012), and instead exploring how participants are thinking with, and even *becoming with* the materials of a workshop, we start to see materials adopt a more agential and active role in tackling problems. Even with materials that are not specially designed, such as in my Design Week Workshop #7, The shapes and textures of the recycled offcuts and craft material did more than make preexisting ideas visible to discuss, or even surface tacit knowledge. Instead, they actively participated in materialising ideas, becoming appropriate for use as they collaboratively reframed and suggested ideas to the participants. Taguchi describes how “the girl as a learning subject emerges and becomes-with the sand in the sandbox, and the sand becomes-with the girl” (2011, p. 38). Similarly, the people showing up to a workshop become participants as the materials become tools for thinking with. Participants become groups as shared interactions and meanings are established with and through materials and the shared act of making. People from different disciplines become problem solvers and makers with the aid of the materials, gaining different competencies according to the materials at hand.

Taguchi argues that this mutual becoming takes place in the intra-action between people and material, (Hultman & Lenz Taguchi 2010; Lenz Taguchi 2011) however, I go further to suggest that even before use the provided materials function as a tool for signalling the sort of experience that participants are about to embark upon, situating participants not only in relation to the topic or problem space, but inspiring a more creative and collaborative mindset. More of the social and experiential capacities of these materials are discussed in the following section, ‘toys’. In the remainder of this section I develop my arguments for focused attention on materials used as ‘tools’ relating to problem solving beyond the traditional framing of material mediation.

4.3 Situation and Anticipation

Performing an image search for ‘co-design workshop’ would reveal page after page filled with group shots of people standing around a board covered in sticky notes, close up shots of multiple hands reaching for cards or worksheets, and colourful yet tasteful and business-like templates and designed elements. Sticky notes themselves have gained such strong associations with this mode of collaborative innovation that they are simultaneously a trope, a beloved all-in-one tool, and the title of one of the most celebrated recent books on the topic of co-design, “Beyond Sticky Notes” by Kelly Ann McKercher (2020). Post-it note, templates, cards and visual tools of the trade are so culturally ingrained with Western design rhetoric of innovation that there is a sort of expectation upon entering a room decorated and arranged in a certain way. This can best be described as “anticipatory causality” (Ahmed 2010, p. 576). The materials used in co-design workshops are so linked through feelings and built up associations that, as Ahmed explains, objects might “acquire the value of proximities that are not derived from our own experience” (ibid). The arrangement of the room and creative implements like scissors, pens and gluesticks signal a more hands-on way of engaging. Like participant E, the council member at the Moreland Workshop #8 shared, “It [sets of colourful materials at each table and room posters] kind of frames the day as already a collaborative space.” (Moreland Interview 2019). This was also observed in the She City (Workshop #3) survey results commenting on the set-up of the exhibition space, and the materials provided. (She City Survey 2018). When considering this capacity of materials to situate

participants in a certain mode of working and frame the problem space, as well as their influence in how participants make with and become with materials, the question of selecting the right tools for the job is necessarily complicated.

4.4 Selecting Tools for the Job

If the job of a designer in these engagements is, in fact, just to develop materials that assist with problem framing, distribute cognition and visually document the process and outcomes, then this initial framing of ‘tools’ that is common in the co-design literature could be sufficient. However, as discussed in the introduction, the role of the facilitator has increased in complexity (Aguirre et. al. 2017; McKercher 2020). In considering co-design workshop encounters as potentially transformative learning experiences and as politicised events that are concerned with the production of social imaginaries, the performative functionality of materials as tools is accordingly more complex. This framing of ‘tools’ values the problem-solving capacities of materials while challenging the procedural implementation of these materials.

Many of the workshops involved in this research project employed bespoke materials, working to sensitise participants (Lindström and Ståhl 2016), and also to ground participants in a specific mode of working. Materials both alluded to and framed the topic being explored, situated participants in this problem space, and even scaffolded their thinking and discussions. City elements helped situate people from diverse backgrounds and lived experiences in discussing urban spaces (workshops 1, 3, 8, 10); space-themed rockets, planets, asteroids and UFO’s made out of felt framed a metaphor of research spaces (workshop 2); essential oil scented playdough, natural materials, evocative images, and symbolic shapes helped scaffold different ways of responding to emotions around climate change and climate action (workshop 12). When viewed through the dimension of tools, we can do more than consider how these materials helped solve problems, we can see the work they do to situate, scaffold thinking, frame the problem, and document ideas and discussions.

Several of the larger scale workshops used bespoke materials, presented in carefully assembled kits or staged displays, and a highly polished presentation to not only situate participants and frame the problem but also to suggest the validity and importance of the topic itself (Moreland participants C and R discussed in 3.1). These professionally-designed materials were time-intensive and costly to make, but worth the effort because they were able to speak the visual language of innovation, and through their anticipatory causality (Ahmed 2010), extend an invitation, even to sometimes reluctant professionals who were dubious of participating.

However, more ambiguous and low fidelity materials did the work of situating participants in a suitable mode of working as well. The 2019 Design Week workshop that encouraged participants to reimagine data in creative practises was open to the general public, designed to interrogate ideas about data that Kelly Anderson, a fellow candidate in WonderLab, had been developing, and was intended to be an exploratory and low stakes, entertaining after work activity. The low stakes and casual atmosphere was complemented by the artsy outdoor space (and bar) provided by Testing Grounds, an open air and flexible space with reconfigurable structures and tables that offer use of the space to creative practitioners. Because this workshop was happening after work with participants who were curious, we adopted a more laid back facilitation style, and kept the presentations and directions short as participants were introduced to a model breaking down data work into inputs, processing, and outputs, then tasked with creating data devices using recycled materials, craft supplies, and offcuts. Similarly, the discussion at the end of the workshop focused primarily on how understandings of data had perhaps shifted, and less on what precisely their machine did and debating the usefulness or functionality. The low fidelity and ambiguous nature of the materials actually did a much better job of situating the participants in the prompt to “re-imagine creative data” than elaborately produced and bespoke designed materials might have done, or prototyping materials that made it seem like functionality and aesthetics were important.

As was discussed previously in 4.2, participants weren’t only thinking through the materials to express previously formed ideas, but with the materials as they inspired ideas, framed the problem and invited

participants to this exploratory way of working. As participants cut and twisted, tried different configurations and were quick to discard or swap out components, the craft materials and cardboard maintained a feeling of low stakes play. The provided materials materiality itself suggested different framings of the problem, yet prevented any aesthetic attention to detail or expectation to produce something that looked polished. The assemblage of ambiguous yet aesthetically interesting forms combined with the workshop space, facilitation style, and combination of people from mixed backgrounds was enough to challenge perspectives and engage participants in “eye-opening” ways that lead to insights about personal expectations and professional processes. One participant shared, “The word ‘data’ filled [me] with Xcel dread, until now. Who knew?” (Design Week Feedback Survey 2019). Without the need to take these ideas further, or to achieve a viable and actionable outcome, these rough and unpolished materials were an appropriate tool to situate participants in an exploratory and low stakes way of working. While underdeveloped and not elaborate, the models still provided something to present and speak to as groups discussed their changed understanding about how data might be worked with and collaboratively performed what their device would do.

4.5 The Wrong Tools for the Job

As Abraham Maslow famously warned, “I suppose it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail” (1966). As designers gain confidence and familiarity with certain tools, there can become an expectation and even dependence upon the tools functioning in a certain way. As I demonstrate how co-design materials successfully situate, scaffold and help problem-frame, I want to be cautious against suggesting complete predictability, or implying that materials, even bespoke ones, will always perform as planned, or are always necessary. From the previous positioning of ‘things’ and acknowledgement of the assemblages these co-design materials perform within, it would be unwise to assume they will function the same way, or to ask too much of them as co-facilitators, problem framers, and tools. The practice narrative below describes a moment in which the invitation of these materials was declined, and their potential to document and scaffold thinking was constrained by an assemblage of awkward working spaces, time pressures, and participant desires.



Figure 31. A group who went outside in search of chairs and a table at the Ally Network Workshop

“Sounds like a great conversation, can I just ask you to try visualising a few of those key ideas? We wouldn’t want to miss anything!” I smile and nudge the paper shapes closer to them, as if proximity was the problem. Moments before when we were introducing ourselves in a circle people had been holding out their tetrahedrons, fiddling and reading off the sides of these paper co-presenters. But now, with groups scattered across the outdoor space and foyer, the paper building blocks and connecting paths and arrows were sitting untouched, anything but vibrant. Groups were engrossed in conversations, and some people were still holding and showing their tetrahedrons. In a different context this sort of networking and sharing of ideas could be read as a success. But the conference organisers wanted a visual network, a model showing connections and priorities, with beautiful visual metaphors like in the images I had shown them, and that as a designer I should be delivering. (Excerpt from Practice Narrative about workshop #4)

In this moment describing the second half of the Ally Conference Workshop (Workshop 6), foldable paper building blocks that had previously proven their capacity for scaffolding, thinking around component parts and visualising connections (0.1 VPC 2016; 0.3 Free to Be Melbourne 2017), were not performing as anything but a table decoration. In the first half of the workshop, the paper tetrahedrons were invaluable. I held them up in the crowded lobby and asked who was here for the workshop, and people gathered around our awkward fold out table, received a tetrahedron and became participants as they started writing down things they do as an ally and using the supporting tabs to think about what supports those actions. There were smiles and appreciative “ooohs” as I explained that the tabs where we wrote what could support our actions would actually support the shape and hold it together, then demonstrated folding it together with no need for tape. That first activity had taken longer than anticipated, so now, with only 15 minutes to make a model of how the Ally Network could support the actions they had previously identified, people were just talking about their experiences and sharing resources they had found with each other. While functionally, the paper blocks had previously proven themselves capable of visualising hierarchy and forming visual models of how organisations could function, there was not enough time, the physical spaces in which to assemble and craft were limited and awkwardly spread out, and, most importantly, it was unwanted. If the tetrahedrons had previously been loud and capable of bringing together a workshop, the paper building blocks were now ignorable and if anything, annoying as groups who had ventured outside seeking space to work had to pick up the papers when they blew off their table, interrupting their conversation.

4.6 Reframing the Job

As a designer, the selection and development of these tools helped me establish a goal, which was communicated and agreed upon by the organisers of the conference. As co-facilitators, the lasercut and colourful paper shapes lent me an air of authority and feeling of confidence as I stepped into my facilitation role, convening a workshop in a room full of strangers in a lobby with no designated space. The paper tetrahedrons instigated discussions, becoming a tool for introductions as conference attendees became participants through their engagement. The paper tetrahedrons and laser cut blocks created visual and physical documentation of the workshop activity that was photographed and later shared by the organisers of the conference. However, the paper laser cut blocks did not help meet the expectation to create a visually appealing and meaningful artefact of the discussion, as they had in previous workshops.

Taking a procedural view, it would be tempting to say the participants misbehaved (Michael 2012) and that I as a facilitator should have corrected their misbehaviour. Perhaps as a facilitator I tried to fit too much in, or I should have repeated and reframed instructions to encourage compliance. Perhaps the materials misbehaved, as the tetrahedrons continued to take up space and attention, even when I had intended to transition to the next activity. Or the paper blocks underperformed, being too ambiguous and metaphoric and not scaffolded enough. Perhaps a more structured worksheet would have better performed the role of documenting and enforcing topics of conversation. But would it have brought a group together in the generous sharing as participants helped each other assemble the shapes? Would it have resulted in the same curiosity and personal connections to the issue at hand that were present in the introductions and that contributed to such meaningful conversations in their groups? How much do the tools designers bring with them to these engagements control the conversations, rather than adapting to emerging directions and what emerges as important or meaningful to participants to discuss?

In moving away from predictive expectations of ‘success’ with an emphasis on the outcome, we see not a failure of materials, or human facilitation, but a need to examine what job design is doing in these spaces and what materials as ‘tools’ are being put to work to do. Several people shared how they enjoyed the experience and were able to meet people when usually conferences were too overwhelming. Later in the conference, someone who participated in the workshop came up to me and shared that they enjoyed the other conference sessions more because they were able to make connections between what they had written on

their tetrahedron to what they had heard and seen throughout the remainder of the conference. For this reason they appreciated the activity.

These more experiential and personally experienced outcomes might not be attended to if a designer was focusing on the model produced or the problems solved. By looking beyond how design was in service to problem solving, the value of co-design processes can be contextually specific and negotiated with the communities and participants involved. This shift in attention allows for expanded notions of value, like those called for by Agid and Chin (2019), which were discussed in the introduction. As the value of these engagements expand, so too does attention to what materials are enabling and making possible, and design considerations to leverage this agency and to work with materials as co-facilitators while not asking too much or placing inappropriate demands on their performance.

In Summary

This proposed framework started by positioning co-design materials as 'things,' in chapter three, recognising the distributive agency of sites, people, needs, desires, and materials. I then proposed 'tools' as a dimension through which to consider material agency in order to complicate the common framing of these materials as passive and neutral 'co-design tools.' By articulating how people are making and thinking *with* the materials and how different types of materials can situate participants in certain modes of working and help scaffold these experiences, I argue that beyond making previously unidentified intangibles visible, these materials are in fact playing an active role in the framing of the problem and the creation of the outcomes. While this chapter articulated dimensions of material agency that relate to problem solving, it also touched upon some of the more experiential and engaging capabilities of these material engagements. To provide a conceptual shift that calls for attention to the more affective qualities of these engagements, I introduce the following dimension 'toys'.

5. Toys

In the previous section, I proposed an understanding of co-design materials as ‘tools,’ as a way of acknowledging that design is concerned with not only creating solutions but exploring alternate problem definitions – and that this is a joint process of inquiry and imagination (Steen 2013) between not only people, but people thinking *with* materials. I ended by questioning the work that designers and indeed materials themselves were being asked to do, considering the more social, collaborative, and experiential qualities of these embodied experiences. This section extends this trajectory away from problem solving further, making an artificial distinction between the roles materials play in regards to problem-solving (previously framed as ‘tools’ in 4.2), and the more affective capabilities of materials which I frame here as ‘toys’. This sort of agential cut (Barad 2007) allows an attunement to the experiential aspects of co-design engagements that designers have been criticised for ignoring (Bowen et. al. 2012; Aguirre, Agudelo & Romm 2017). Such a framing extends notions of value beyond problems and outcomes by attuning to the process itself and acknowledging the playful potential and importance of affect in the kind of material-affective-semiotic entanglements (Osgood and Giugni 2015, p.349) we see in co-design workshops.

I argue play is an important aspect of the act of designing, both as structured design games (Johansson 2005; Brandt & Messeter 2004; Vaajakallio & Mattelmäki 2014) and the more ambiguous and open-ended play using playful triggers (Loi 2007; Akama et. al. 2007; Light & Akama 2014). Building upon this literature I move away from the typical emphasis on how the playful qualities of materials help produce an outcome, to instead focus on how people's ability to act and relate to each other, and to shared issues, are increased in these engagements. I then discuss the implications for the designer to be able to adapt to a flexible and emergent co-facilitation practice by facilitating with materials as ‘toys.’

5.1 Play: Design Games and Triggers

In considering the role of co-design materials in helping participants engage with the challenges of our times it is common to hear about hard work and innovation, but not necessarily play. Even in creative and collaborative co-design workshops, there can be a tension experienced between expected modes of working, and the playful potential of a materially co-facilitated approach, as was evident during the participant interview from Workshop #8, discussed in 3.6. However, scholars who have studied play make a strong case for encouraging and valuing play. Carl Jung famously argued, “The creation of something new is not accomplished by the intellect but by the play instinct acting from inner necessity. The creative mind plays with the objects it loves” (Jung cited in Caleb 2015). Diane Akerman takes up the idea of a play instinct framing play as deeply spiritual, human, and more-than-human in her book *Deep Play* (1999). In this book, she demonstrates that “The more an animal needs to learn in order to survive, the more it needs to play... What we call intelligence ... may not be life's pinnacle at all, but simply one mode of knowing, one we happen to master and cherish” (Ibid, p. 4). A more playful way of knowing and making is sometimes discussed as vital for creative practice, however, in co-design literature, there is a tendency to discuss play mostly in relation to the thinking and creativity it inspires.

In co-design literature, the focus is less on socialisation or self-realisation, and more on how playful ways of working are often employed in service to creative thinking. This is exemplified most in Kirsikka Vaajakallio's research into the border between codesign and game-like activities, what she calls ‘design games’. These are “tools for co-design that purposefully emphasise play-qualities such as playful mindset and structure, which are supported by tangible game materials and rules” (2012, p. 218). The design of these games or playful activities is linked to the objectives of the design process, which is why she refers to these games as ‘tools’. Their purpose is to address what she claims are the three needs of co-design: “organising dialogue, supporting empathic understanding and gaining several contributions in order to identify, frame and solve

design problems” (Vaajakallio 2012, p. 219); as well as enabling “collaborative explorations of future opportunities in inspiring atmospheres” (Vaajakallio & Mattelmäki 2014, p. 63). Ranging in complexity, these design games can include elements such as cards (just as my own research explored in workshops 0.1, 1 and 9) complete designed games with rules and objectives (as I explored in workshop 5) or activity structures that are game-like in nature (such as in workshops 2, 5 and 11), that enable a playful mindset and process.

Another approach is the use of what Daria Loi (2007) calls ‘playful triggers’. Loi examines the potential for communication and inspiration through the inscription of metaphors upon preexisting objects. She explains;

These tools generate receptive modes through their tactile, visual, mysterious, playful, tridimensional, poetic, ambiguous and metaphorical qualities and ask people to challenge taken for granted or conventional ways of doing, seeing and articulating things to co-generate shared understandings and collaborative practises. (2007, p. 238).

Loi proposes that these tools inspire communication and create a dialogue that helps participants provide nuances and insights that a more direct and to the point discussion might miss. Rather than play being an inherent quality of the objects used as playful triggers, these are playful in the sense of having multiple interpretations. In other words, they carry the potential for play, depending on how they are used. She argues that the act of arranging and working with them is playful since “to make requires playfulness, and to play is to learn. Learning occurs in the making of things and is an active experience which helps create and share new meaning” (Loi 2007 239). This hints at the agential capacities of design materials as she describes how they spark insights and learning. For the purpose of better articulating what these materials enable beyond a framing of ‘tools’ I find it useful to adopt a new materialist framing which enables us to progress beyond play as a social phenomenon that is primarily cognitive, and instead see ways in which play is affective and embodied. It is from this more materialist understanding I propose ‘toys’ as a way of understanding material agency that is related to but more overtly experiential and embodied than the cognitive capabilities discussed in tools.

5.2 Bodies at Play

As the benefits of play become more widely acknowledged and the contexts in which adults might be permitted or even encouraged to play are diversified, social and interpersonal benefits are beginning to be examined, such as how playful moments and improvisational games can improve teamwork (West et al. 2017). However, even these discussions tend towards the positive effects on productivity such as how play helps us think, create, and innovate (Smith 2013; Lemelson Centre 2014). In proposing ‘toys’ as an important dimension worth attending to, I refer to and seek to leverage these benefits, while also attending to the affective potential of such a deeply embodied and relational experience as play.

Robinson and Kutner (2019) describe a renewed interest in the affective turn, stemming from an increase in social sciences taking up “ontological orientations that emphasise immanence, indeterminacy, and relationality à la Deleuze 1970/1988.” (111). They expound upon Spinoza’s original theory for “affections of the body by which the body’s power of acting is increased or diminished, aided or restrained, and at the same time, the ideas of these affections” (Spinoza cited in Robinson & Kutner 2019, p. 114). Rather than taking up their ontological question about the nature of affect, in this examination of toys I instead care about how, through playful and embodied experiences with co-design materials understood as toys, the capacity to affect and be affected in relation to other bodies is increased (Spinoza 2018 cited in Healy & Mulcahy 2020). This takes up the feminist project to reject the dualistic partitions of minds from bodies (Braidotti 2011, p. 128) which progresses the discussion from how co-design tools are helping structure thinking, to the different ways in which participants are being in relation to each other, materials and ideas. In this tracing of how affect comes into existence, we see a more relational view of embodiment as “neither a biological nor a social category, but rather a point of overlap between the physical, the symbolic, and the material social condition” (Braidotti 1994, p. 161). This human *being* as well as the capacity to affect and be affected are advocated by Braidotti as

preconditions for showing up in affirming and responsive ways, and — as I will demonstrate — can be enhanced by the playful potential of co-design ‘toys’, as active material co-facilitators creating the relational conditions of these design encounters.

5.3 A Playing Back of Materials

Following the decentering of human agency and intentionality granted by the positioning of ‘things,’ there is more opportunity to attend to the performative agency and even a playing back of materials. Lenz Taguchi’s (2013) descriptions of play and learning in early childhood education take up this perspective, illustrating how things and objects in a classroom can “dislocate sedimented pedagogical practices so that something new becomes possible.” (Jones 2013 in Lenz Taguchi 2013, p. 83). Animating the physical affordances of round tables, clustered chairs and shareable materials, humans and nonhumans alike are framed as performative agents that “have power to act and transform each other and themselves” (Lenz Taguchi 2013). She points out that just as people can play with materials, we can apprehend a playing back of the materials to people. This is illustrated in her discussion of how the materiality of ‘things’ (in her case, sand) can transform the notions, conceptions and emotions of the player as much as the player can transform the materials.

This attention to how materials ‘play back’ recognises their agential capacities, creates a sense of possibility for what might emerge from playful encounters, and draws designers’ attention to ways of being as an intra-active and embodied experience such materials might enable. Instead of just looking at how people might play with what designers make, and the social or cognitive benefits of this, my framing of ‘toys’ is still situated within a theoretical conception of Jane Bennet’s vital materialism. This proposes two different ways to consider the agency and agentic potential of co-design materials, firstly, “toward the humans who feel enchanted and whose agentic capacities may be thereby strengthened.” (2010, p. 10). When considering co-design workshops in terms of how people’s capacity for action and becoming is increased, we can see outcomes and value in the process beyond the ideas proposed, by looking at how people were acting, feeling, and what they were capable of doing that otherwise might not have happened or been made possible (this will be examined further in section 4.4 ‘Technologies’). Secondly, we might examine “the agency of the things that produce (helpful, harmful) effects in human and other bodies” (ibid). How might more experiential and playfully-designed materials inspire, delight, engage, and otherwise affect the potential of people to act, and even become in relation to one another in these design engagements? While Vaajakallio & Mattelmäki (2014) frame design games as tools in service of supporting empathetic understanding and encouraging multiple contributions towards the problem solving, through the dimension of toys we can pay more attention to the affectivity and changed behaviour of participants, as materials become players with toys.

5.4 Becoming Players

The moment before the start of a design game is discussed below, from *Free to be Sydney* which was conducted with the Monash University XYX LAB, Plan International, Crowd Spot and ARUP in 2018 (Workshop #1). This workshop brought together youth activists and more experienced academics, urban planners, and professionals around the issue of women’s safety in urban spaces. The objective of this workshop was to co-design a reporting app that would overcome obstacles to formal reporting and empower young women in sharing their stories of sexual harassment and spaces where they felt safe or unsafe. At the heart of this workshop were tensions between questions that young women felt were too invasive or victim blaming, and the questions that would ensure consistent data that was needed to fight for policy change and implement new measures. In the first of three stages, young women (framed as experts of their lived experiences) worked together to articulate how they would want to share their stories, and professionals (framed as having professional expertise and influence) discussed the types of data and stories they already had access to, would like to have, or needed to have. The priorities from both groups were presented and discussed, and then differences between the priorities were assigned for mixed teams to work on in the prototypes. When viewing the material agency through the dimension of tools, designers could see how this mapping game scaffolded creative engagement and comfortability with maps through card prompts that encouraged physical interactions and collaborative drawing and cutting. It also helped situate participants in the geographic

location and cartographic modes of storytelling they would be designing an app for. Thought of as a ‘toy’, a different story about how participants become players, and how materials can encourage an increased capacity for action and collaboration becomes more legible.

Figure 32. Participants playing a map game in workshop #1



As everyone makes their way around the room finding their new seats, I can hear shuffling, rustling and the scraping of chairs. Earlier in the day there had been instant chatter as the youth activists (who already knew each other) sat down at their table; and more formal, yet friendly, introductions from the professionals sitting down around their own tables. Now it is so quiet I can hear their footsteps. Everyone had already performed perfunctory introductions at the start of the day so perhaps the discomfort is my own, as I watch the new groups stumble through these awkward pauses and glances around and at each other. I start to worry I was wrong about taking time away from the main objective, that this was unnecessary and maybe even too juvenile.

These researchers and urban space professionals are taking time out of their day, asking them to play a game might be insulting. Around the room chairs are scooched as everyone comes closer together around the large, game-board like map that is in front of each group. Cards are taken out, and accordingly, there is a gradual uptake in drawing, discussing and an occasional laugh. Several girls excitedly realise they have the same favourite beach, and the urban lighting expert at their table jokingly quips ‘any beach but Bondi.’ The more conversational energy has changed the uneasy atmosphere, and around the room. As a facilitator in this space, I feel more at ease in the rhythm of working and discussing that has been established. (Excerpt from Practice Narrative about workshop #1)

Having established in the previous section that the materials at hand can situate and scaffold a way of working as ‘tools’, through the dimension of ‘toys’ we can now turn our attention to see the ludic gestures that were made possible by the cards and game boards that were designed for this workshop. As cards were shuffled and flipped the carefully designed, competitive, collaborative, and timed prompts changed the ways players interacted with the large game-board like maps. This invited a mode of interaction that was less serious and co-constructed a more conversational way of working. Through this engagement participants became part of what play scholars refer to as a ‘magic circle’, a term first coined by cultural Historian Johan Huizinga in his formative text *Homo Ludens* (1955). These magic circles created through play are “temporary worlds within the ordinary world, dedicated to the performance of an act apart.” (1955, p. 10). These socially and structurally demarcated spaces are distinct from the expectations and norms of everyday work, allowing players to come together and act in ways they otherwise may not (Huizinga 1955; Salen & Zimmerman, 2004). While play scholars tend to focus upon the ongoing engagement and negotiation between people at play, I attend here to the invitation of the materials, being considered through the dimension of toys, that allowed a table of strangers to become players. As the playfulness extended beyond individual bodies, the energy of the room increased and the atmosphere was transformed.

While the playfulness here is less than the unbridled, instinctual and even animal-like play that Brian Massumi describes, we can see here how “The ludic gesture releases a force of transindividual transformation. The immediacy of the transformation that the gesture’s execution induces qualifies the ludic gesture as a performative act. Play is made of performative gestures exerting a transindividual force” (Massumi 2014, p. 5). The materials offer ways to engage that not only signal to other participants, but also increase the capacity of

the group to relate differently to each other and if desired, become players together. In this interchange and mutual enactment of play which causes a situation to “swell with possibility” (ibid, p. 9), there is an opening up of appreciation of difference, such as gender, age, sexual orientation, familiarity with Sydney, perception of safety, or priorities for the app. In the example above, power dynamics were flattened as youth and older professionals became equal players, performing the actions and mutually constructing and abiding by ways of working and playing together that spilt beyond the temporal limits of the game. While the designer/facilitator is still the one who is planning the session and inviting certain materials, considering co-design toys in this way invites the designer to apply their authority towards holding space for more improvisational and affirming ways of working. Sharing the power (such as decision making and ideas about what to do next (Steen [et.al.](#) 2011) can be supported through these playful ways of relating to each other and materials.

Participants who had previously been reserved and distant finished the game physically closer and visibly energised after the playful interlude. This rehearsal of collaboration, storytelling, and engaging with maps flowed seamlessly into the next prototyping activity as the game cards were put away and prototyping kits came out. Staying in the same spot with pens and markers already drawn, participants took to a more informal turn taking. In the design game, the co-design ‘toys’ elicited differing opinions by asking for three different versions, or asking for multiple versions of something. Now, with the paper screen templates and sheets of symbols, these rituals were maintained as groups debated and proposed multiple versions, visually engaging and prototyping much the way they had in the game.

5.5 Invitation and Designerly Care

While there was no way to predict how well the design game would perform, in addition to making the game relevant and thinking about the types of actions it would prompt, the designerly care and quality of materials themselves helped indicate importance. The branded and beautiful cards matched the style of the rest of the activities and were carefully cut from cardstock. The large printed maps were novel and exciting since the size and quality of this format of printing is typically not used for things people would cut, draw and play with. This aesthetic demonstration of designerly care and attention to pleasure (Gaver et al 1999 in Loi 2007) elevated the materials into something special, more considered and bespoke than a generic icebreaker and physically manifested my desire that the people volunteering their time and energy enjoyed their experience. Within this carefully designed and facilitated engagement, the cards created opportunities for the sort of welcome uncertainty seen in aleatory play. As players experimented with leaving traces and telling stories cartographically, the introduction of unpredictability that comes from the randomness and combinatorial play of cards was safely held within the magic circle created by playing and was guided by understandable rules and objectives of the game. In this case, the cards and maps as ‘tools’ situated participants and encouraged experimentation with how to tell stories in relation to the map. As ‘toys’, however, they transformed hesitant and unfamiliar people sitting around a table through the transindividual force (Massumi 2014) of becoming player(s). These groups established a conversational comfort with each other, through the material facilitation of this planned interlude. For this particular workshop with unequal power imbalances, it was important for us to consider psychological safety and encourage equitable contribution (McKercher 2020). To do this, the cards were designed to invite creative actions in a turn based way that rewarded working together. However, in considering co-design materials’ playful capacity via the notion of ‘toys’, we can look beyond design decisions like the scaffolding and pre-planning of designed games like cards, and towards the desires that groups of participants bring when in a more exploratory and less purposeful space. In these cases, less prescriptive and more embodied ways of playing together and with materials could emerge.

5.6 Free Play

This more emergent and subtle free play can be seen in a moment from a Melbourne Design Week workshop, *Co-design materials for climate action 2021 (#12)* which was designed and facilitated with Ilya Fridman and Lisa Grocott. Responding to an invitation to explore how different materials would enable different ways of accessing emotions about climate change and climate action, a group of 18 volunteers including some designers and creative practitioners took turns rotating through four different sets of materials, which were

introduced as co-facilitators. In addition to materials such as paper cut outs and image provocations, the sort of generative tools discussed by Sanders and Stappers (2012), we also provided scavenged natural materials and playdough to encourage less literal interpretations. The playdough, which was home made and scented with eucalyptus oil for its antibacterial qualities and to encourage attention to the senses. All the materials were selected to be re-used, or in the case of the natural materials and playdough, to decompose.

While this workshop did not seek to codesign an outcome, these materials were invited as co-facilitators so that we could discuss indifferent aspects of what this physical and embodied mode of working through emotions around climate change was enabling individually and collectively.



Figure 33. Participants playing with playdough in Co-Design materials for climate action (#12)

“Just don’t eat it” someone teases in a cautionary tone, much to the others’ appreciative laughs. Around the room, people have just taken their seats at tables with different types of materials, and the homemade playdough on the table quickly becomes playdough in motion as participants squeeze, poke and roll balls while I deliver a prompt to “work through feelings about climate change using whatever materials are in front of you.” Looking around the room, this table appears to be having the most fun. In one group, there is a seemingly serious conversation taking place as the cards with evocative photos are collaboratively being arranged to make a sort of storyboard. The group with laser-cut paper shapes are individually sorting through the different abstract, natural, and human-like shapes, quietly constructing individual collages in an unhurried rhythm of placement, consideration, and rearranging. A group with freshly collected leaves, roots, seeds and stones are discussing the materials, looking, appreciating, but not touching anything yet. Hearing a ‘splat’ I turn around to see a younger woman grinning mischievously as she looks down at her splattered playdough and shares with her group, “that felt good!” (Excerpt from Practice Narrative about workshop #12)

More so than at any other table, the ways that participants interacted with each other and with the playdough became much less constrained or purposeful as players rolled, squished, splattered, and explored the potential of the malleable material. Whereas the structured design game in the previous example had facilitated conversation and encouraged turn-taking and collaboration, in this encounter with playdough, conversations became what Deleuze and Guattari (1987) call ‘collective enunciations’ (cited in Lenz Taguchi 2014). These are “utterances [that] do not seem to emerge from individual experiences, nor are they stated with specific intentions; rather, they were called forth and emerged as actualized consequences of what was going on in the interactions of playing” (Lenz Taguchi 2014, p. 85). These enunciations, understood as both verbal and physical (Stratford 2002), challenge the primacy of language and dialogue, and expand attention to what materials as toys make possible beyond intentional actions like problem-solving. Through splats and squishes, we see people playing with the materials in the process of trying to make themselves intelligible to each other as different kinds of matter involved in an active and ongoing relation (Barad 2003). This embodied process of becoming intelligible is further illustrated in a conversation between three participants who had been at the table together while playing with the playdough.

L: Oh this is fascinating isn't it? Don't you think it's funny what we're doing? We're all just like (demonstrates how she has been squeezing the Playdough).

C: It's like the haptic –

T: Yeah.

L: I'm literally, more than any of the other [sets of materials], I have no thought in my mind. I'm just seeing what it does, and it's starting to do something, and I see what I am doing with this.

C: It's almost like a stress ball.

T: That's what I was thinking, maybe it's like our climate trauma stress ball.

C: Like what if we did nothing?

L: Yeah I was thinking, what if this is all we did? If we just had a good conversation, just did this.

This moment of play could be seen as a vital step in increasing ideas or assisting with the ease of collaboration (Vaajakallio & Mattelmäki 2014). It might be considered important because the way one works directly affects the end result (Johansson 2005), and a more playful and creative process might enable more innovative outcomes. However, by emphasising the value of playing processually, and attending to relational embodiment, my framing of co-design toys challenges accounts of design that are reductionist (Storni 2012), and that flatten the process through historical revisionism (Schon 1992). Working against tendencies in design literature to oversimplify and instrumentalise emergent processes in order to promote resultant outcomes and ideas being produced (Akama 2015), the dimension of co-design toys asks designers to look beyond what is being produced, and instead attend to the processual experience that is emerging and being co-created. Once the need for productivity (which in a design workshop might look like problem-solving, ideation, visually representing and discussing ideas, and the expectation of an outcome) is playfully set aside, we see how the materials make possible a more embodied way of being in relation to not only materials and other participants or players, but being in one's own body as well.

5.7 Affective Subjects

In their verbal and physical enunciations, people were often chatty even when not prompted. They were not discussing ideas so much as being in conversation together as they made and explored emotions, in a playful ponderance that was activated and encouraged through the gentle squishing of playdough. We see here similar qualities to Akerman's descriptions of deep play.

As the world reduces to a small brilliant space, where every thought and move is vital to one's salvation, one's scattered energy suddenly has a centre. Only then do all of our senses spring alert, and every sensation matters. At the same time, the rest of the world recedes. One is temporarily unshackled from life's chains — the family ones, the work ones, the ones we wear as self-imposed weights. (2011, p. 21)

In their collective decision to not intentionally create outcomes or visualise ideas, and to instead, just squish and squeeze and not think, but feel their emotions, participants in the *Co-design materials for climate action* workshop took on a sort of ability to respond. Instead of producing an outcome or solving a problem, they held space for each other, opening themselves up to the affective encounter. In the freedom from constraints and expectations created in the liminal and materially mediated 'magic circle' of play, these players become capable of being in the world differently and being affected. Kathleen Stewart (2017) describes this as becoming an affective subject, for whom "there is always the weight of the world in what can be hoped for and what must be feared, in what flourishes and what matters. Life is an experiment of being in a world" (Stewart 2017, p. 194). This design encounter opens up not only new ideas, or a more collaborative experience, but ways of being in relation to each other and the world.

Attuning to the affective potential of materials in these encounters, designers can create or select materials that not only surface ideas and help people think, but support a process of building capacities, such as the capacity to sit with and work through emotions regarding climate catastrophe, such as in the example above. This increased potential to feel, to affect and become an affective subject ultimately is the condition in which

Braidotti (2018) suggests we may “become intimate with otherness and diversity” (p. 114), opening outward to the word in an affirmative gesture (Braidotti 2018; 2019). The importance and potential for co-design materials to enable the becoming of an ethical subject is discussed more in the next section, ‘technologies’. Here I continue to focus on the affective capacities and playful potentials offered by the dimension of ‘toys’, and what this asks of designers/ facilitators as well. This playful move away from outcome-oriented and procedural workshops allows participants to respond and work together differently which enables and requires different moves of the human facilitators/designers as well.

5.8 Enjoyment, Engagement and Enchantment

In describing this more engaged way of working and indeed playing there have been several accounts of smiles and smiles and laughter. However, it is important to acknowledge that enjoyment and joy are not inherent to this process, and are not the end goal. As a ‘Feminist Killjoy’, Sarah Ahmed points out the always already political pursuit of happiness⁸. “It is not too clear just what the word happy really means and still less what true values it may mask. There is no possibility of measuring the happiness of others, and it is always easy to describe as happy the situation in which one wishes to place them” (de Beauvoir 1997 cited in Ahmed 2010, p. ii). Looking at images of colourful workshops and smiling participants it is tempting to inscribe enjoyment, even happiness based upon our perception of engagement, task completion or productivity. Amidst catered tea breaks, high energy activities and the overall aesthetics of the materials which so often speak the visual language of innovation, it is easy to lose sight of those who participate out of duty, who find themselves engaged but not enjoying the experience.

Ahmed (2010) argues in her notion of “happy objects” that happiness functions as a promise that directs us towards certain objects, which then accumulate positive affective values as the associations are sustained and preserved. Similarly, I propose that these co-design materials carry with them the promise of creativity and collaboration, strengthening their capacity as they are enlivened and played with by other participants. As participants who are unenthusiastic or uncomfortable with hands-on modes of working are able to discuss and be part of the making with other participants who are engaged, the associations with creativity and collaboration are sustained and amplified. These materials draw upon socially constructed understandings that the co-design activities will be worthwhile, important, and aligned to the goals of the organisation. This sort of engagement could be thought of as enchantment, (Bennet 2010) in which matter itself is seen as vital and for “the humans who feel enchanted and whose agentic capacities may be thereby strengthened” (xii) in the assemblage. This material capacity to enchant, to engage and increase capacities also extends to the facilitators who may find themselves able to play and be receptive as the material provokes and prompts unexpected turns.

5.9 Breaking the Rules



Even as play “hones our improvisational prowess and augments our capacities” (Massumi 2014, p. 14), it also invites responsiveness and a move away from overly determined facilitation. As a designer, encouraging making with playful material that were structured by loose prompts and flexible ways of making together reflected my values, yet posed challenges as a facilitator. This was a shift away from thinking of tools to make participants do things, or to visualise and document certain ideas. Such an example is described in this practice narrative below from *Research Space 2018* workshop 2. This workshop was designed for Melbourne Design Week, with participants from other academic and

cause of her feminist and queer challenges to happiness that add a necessary nuance. However it is worth noting her framing of affect is more in line with emotions and feelings, while the new materialist aims of this research understands affect more as a material force or intensity following Spinoza, Deleuze and Massumi.

industry affiliations who were interested in learning more about the work being done by Monash's Wonder Lab. This workshop was intended to be playful and a materially exciting way in which explore the visual metaphor of a research space through bespoke laser cut felt shapes that were reminiscent of children's felt toys. It was my intent as a designer to scaffold a game that invited more spontaneous and collaborative play, beyond following the rules of the game. As the encounters with 'toys' encouraged participants to play and explore, I discovered there was the potential for the material invitation to take the encounter in a direction that I, as the facilitator, was not expecting and as a designer had not planned for.

I didn't have time to question what she was cutting before I heard the snip of scissors through felt and watched in disbelief as this distinguished professor cut my felt planet into two. Suddenly transported back to days of make-believe and sandboxes I wanted to pout, *No fair! That's not the rules of the game, you can't do that!* Remembering the hours it took to design and laser cut this set of materials, I started feeling a little indignant. *I made that for you, how dare you?* That familiar feeling of thinking I was in control, that my curatorial play was going as planned came crashing down around me. Taking a breath I thought frantically about how to facilitate this next step. Do I laugh it off and proceed as planned? Do I impose a rule clarifying that I had imagined us discussing changes, not physically modifying the elements? Before I could figure it out, a masters student sitting next to me smiled and took half of my planet, offering me a felt asteroid. Suddenly feeling more curious about this new potential to not only make connections but physically offer parts of our research spaces to others, I realised this subversion and rule-bending *was* play. Beyond just enjoying the activity and having fun with the toy-like felt elements, it was about the freedom to imagine otherwise and act accordingly. (Excerpt from PN workshop #2)



Figure 33. Felt space elements from workshop #2

This rebellious act of unmaking went against expected behaviour, yet it was incorporated by the group as players and led to an unplanned but rich way of sharing and taking on elements from others' spaces. As a designer, I was deeply offended that someone had essentially ruined this carefully crafted toy for future use. As a facilitator, I was stressed, trying to figure out how to respond, and maintain my confidence which Vaajakallio describes as "the image that the researcher presents to indicate to the participants that the situation is under control and, although it is always unsure what the exact outcomes are, gives the impression that co-design evidently produces relevant material for the design task at hand. This is part of the motivation for the participants to be involved" (2012: 221). But as a player, I was exhilarated. We owned this move that had emerged through our actions as a group. It suited our specific engagement with each other and these materials in this moment better than a predetermined rule might have, and the mode of sharing and interchanging elements that came from this disruption made the experience richer and more meaningful than I had initially imagined.

Within this engagement, there was a playful queering of possibility as "im/possibilities" were iteratively intra-actively reconfigured through this assemblage of socio-material players (Barad 2015). On a conceptual level, different ideas about what a desirable research practice consisted of were materialised and explored without the need to fix identity or meaning, allowing multiple possibilities to exist at the same time. In this post-representational mode (Maclure 2013) there wasn't a need to label or attempt to represent, as the materials' meanings and implications were able to shift and change in relation to what others were sharing and doing with materials through unspoken, physical and playful responses. What was overwhelming and blocking momentum in one person's space became a gravitational pull to a different participant. The ideas were not fixed or static but emerging through the intra-action, with the materials themselves actively participating in conversations between self, others, and possibilities (Edwards & Korsmeyer 2017). Through this playful and relational way of working, there was a working through of "imaginaries that are material explorations of the mutual indeterminacies of being and time" (Barad 2015). Rather than a problem solving, or

idea-representing objective, the material play itself enabled ways of working and thinking-through that were less rational and more embodied and affective. Within this playful unfolding there was a 'margin of manoeuvre' (Massumi 2014), a performance in the moment of possibility that can't be thought of or planned, but which gains potential in direct relation to the push and pull of the effective encounter and which can change and expand people's capacities for action.

5.10 Enabling Manoeuvrability

Despite intentionally playful facilitation and material invitation, play can fail when the pull of lived importance or corporeal truth is too strong (Massumi 2014). If this had been a 'serious' workshop, rather than a playful one, there might have been more pressure to perform in more expected ways and the freedom to make the cut in the first place might have been diminished. The freedom from expectation and playful enablers of different ways of embodying space, becoming together and relating to the topic at hand fail or lose their potential when they fall victim to pressures of truthfulness, affective intensities such as anxiety "re-establish their hold on the territory" (ibid). Similarly, the materials themselves may preclude hacking and modification. If the scissors that were out from previously cutting the yarn did not also work for cutting felt, or if felt was a more expensive or one-off material, the creative cut might not have occurred, or might have been proposed but deliberated upon. This is why an attention to the potential affects of toys is so important, to consciously create the conditions in which materials can perform playfully, and to prevent pressures of productivity and expected plausible outcomes to overshadow spaces of emergence, engagement and the embodied being and becoming enabled in these experiences.

Beyond the remit of co-design engagements to inspire new and imaginative ideas, the attention to the material agency of 'toys' can create conditions for play, improvisation, and a transgressive power of learning that Jaarsma (2016) asserts can undo-progress narratives. We see this in the ability of cards and a game board to encourage participants to become players and rehearsing ways of marking maps and storytelling as strangers get to know each other and rehearse collaborative ways of working. We see this in players with playdough fully engaged and participating yet deciding to not make, to not produce, to instead talk and sit with emotions and *process* their emotions around climate change. We see this in improvised ways of working, of adapting, and being in relation to each other.

In designing and facilitating with co-design 'toys' designers might be able to surrender a need for problem-solving, and the accompanying aesthetic control of what this collaborative innovation looks like. In seeking to create moments that embrace the emergence, and attend more to the affective qualities of engagements, a designers/facilitator can respond to things that are just becoming, rather than keeping their eye on the prize, the script, the run sheet. As Luján Escalante (2019) proposes in an argument for re-evaluating the value of co-design value practices, "If the lamp gives us music, let's learn to dance" (p. 62). In thinking of the role of co-design materials as toys, we can see something happening that is at once more subtle and yet more fundamental than increased creativity and collaborative ability as argued by play scholars and designers (Loi 2007; Brown 2010; Vaajakallio & Mattelmäki 2014). In thinking of the role of co-design materials as toys, we see an increased capacity to affect and be affected which are in relation to those of another body (Spinoza 2018 in Healy & Mulcahy 2020). We see the manoeuvrability that Massimi describes as opening up "where we might be able to go and what we might be able to do " (2015, p. 3). In this attention to the emergent and affective potentials, we ask different questions about what is being made possible in these engagements.

6 Technologies

Initially, through the positioning of ‘things’ (Chapter Three), it became possible to examine co-design materials’ agency within the socio-material assemblage of a workshop. To better attend to this agency, three dimensions were proposed that are especially beneficial for designers and relevant to co-design workshops. By proposing the dimension of ‘tools’ (Chapter Four) the utility of these materials for problem-solving was acknowledged, and their active role as co-facilitators was appreciated, challenging the passivity of being ‘in use.’ Considering material agency through the lens of ‘toys,’ (Chapter Five) attended to the playful potential and affective capacities of these embodied experiences, revealing the increased manoeuvrability and capacity to act resulting from the affective qualities of these materials. This third and final dimension through which to consider materials agency as ‘technologies’, examines what is becoming possible as participants act in ways they otherwise might not be inclined to act or normally have the capacity to do, as they performatively make and learn with materials in the future-orientated, generative space of these co-design encounters.

6.1 Technologies as a Dimension

So far we have focused on the utility of co-design materials for problem-solving through the dimension of ‘tools’ and explored the playful potential and affective capacities of materials through the dimension of ‘toys.’ Proposing this third dimension ‘technologies’ then, builds upon the two previous dimensions in order to attend to what is becoming possible the materially-mediated and affectively intense workshop encounters. In keeping with the previous framing of ‘things’ acting as part of assemblages, the term ‘technology’ takes on a new materialist inflection which takes into account the “heterogeneous array of discursive elements and practises that encompass, without privileging any one modality, the affective, the political, the institutional, and the biological” (Shildrick 2015, p. 18). Within these assemblages, various modes of acting and relating are enabled, provoked, or constrained, with serious implications for how participants can not only learn but become.

This dimension of material agency is posed to consider what is becoming possible in the ‘socio-technical assemblage’ of a workshop⁹. In looking at how the materials in these design engagements are actively enabling different ways of being, ‘technology’ then expands the attention beyond the immediate assemblage to “encompass an arena of action far in excess of two or more intersecting bodies” (Shildrick 2015, p. 18). In this way, we can see these materials as not only capable of activating receptive modes of engagement (Loi 2015) but also enabling capacity to act and invoking potentialities (Lenz-Taguchi 2010), through the sensory and embodied playing back of the materials. Having discussed the active role in problem solving, playful potentials and affective capacities of materials, the question becomes, what has this mode of engaging – one that is affectively charged and performative – made possible?

6.2 Attuning to Possibilities

As discussed earlier in Chapter One, *Introducing my Research*, even descriptions of the materials in use that do attend to the participants’ experience— such as Loi’s (2007) discussion of playful triggers, and Aguirre, Agudelo and Romm’s (2017) framework for facilitation tools – attend more to what people did with the materials, and the outcomes and ideas produced. Loi (2007) describes co-design materials as activating “receptive modes of engagement, favouring sensory over formal attributes of that engagement” (Dekman

⁹ I am using Shildrick’s (2015) phase ‘socio-technical assemblage’ here rather than Osgood and Giugni’s (2015) ‘material-affective- semiotic entanglements’ that was key in the framing of toys, because toys sought to illuminate how the entangled thinking-doing-making with materials was co-constituting and increasing potential to affect and be affected. In considering what is made possible in these design engagements/ intra-actions of becoming participant, the framing of technology used in a new materialist way acknowledges this entanglement, but follows assemblage thinking’s attention to exteriority to ask what that produces.

1973 cited in Loi 2007), which starts to account for what this receptive mode of engagement does for participants, and the ideas produced. However, she does not go into detail about what *e/se* these increased capacities enable within and beyond the workshop assemblage, beyond the scope of problem solving. A new materialist perspective means we are able to ask not only ‘what do people do with the materials?’ but also ‘what might people do with what materials do to them?’ (Osgood & Scarlet 2015). The dimension of ‘technologies’ encourages shifting attention from what people are doing, to what is being made possible and how capacities for action were increased as a result of these material encounters. This resonates with calls for a more expanded notion of temporality, such as Gatt and Ingold (2013), by considering what happens after the act of designing. This framing of technologies and attention to what becomes possible as a result of the design encounter also responds to Agid and Chen’s (2019) assertion that designers need to be more accountable to not what is made, but *how* it is made and how the outcomes and process both are aligned with the values of the partners. This shift in value and attention from the qualities of the object being made to the political and ethical ramifications of the process of coming together and making itself is increasingly recognised as co-design increasingly takes on complex social issues and democratic innovation (Björgvinsson, Ehn & Hilgren 2010). However, the discussion of materials remains in service to the outcomes with attention paid to what is being made – not attuning to what this making in turn makes possible.

These processes become necessarily more improvisatory and performative as co-design workshops start to engage with the creation of possibilities and futures. Akama, Pink and Sumartojo (2018) call for design scholarship to align towards this understanding of futures as “ongoingly emergent, contingent and indeterminate” (10). This calls for attention to what is being made possible, or who, and what is being constrained, not only in terms of the project outcomes but the participants’ own capacities. As such, this framing of technologies draws attention to how the materials are enabling a mutual *becoming with* others and materials, the political and ethical ramifications of this mutual “coming-to-be” (Barad 2010, p. 141), and what is made possible as a result of this materially co-facilitated process.

6.3 Becoming Ethical

Describing the challenges of working towards a more just and inclusive society, Braidotti (2017) declares, “One has to become ethical, as opposed to applying moral rules and protocols as a form of self-protection” (p. 24). This ethical becoming is not about moral intentionality (that of a purely rational thinking subject), but rather an ongoing process that is evidenced by “the effects of the power (as repressive potestas and positive potentia) actions are likely to have upon the world” (2009, p. 46). Importantly for Braidotti, this power ought to be sustainable in that it enables others’ continual becoming, and should be affirmative in the sense that it “actively works towards the creation of alternatives by working through the negative instance” (2009:, p.47). This philosophical argument for becoming ethical in ways that can be sustained and enhance the ethical capacity of others (including more-than humans) is similar to Gatt and Ingold’s (2013) argument for understanding the act of designing in this more processual and performative way. They argue design is responsible for more than just projections and targets, which they claim end up being unsuitable as circumstances change and hopes and dreams evolve. Instead, they argue for designing as a “sustainable practice of improvisations”, or response which is capable of keeping life going (144). This view of designing illuminates the value in attending to how the assemblages allow for manoeuvrability and the ability to act or respond by those involved in these material discursive practices. However, this notion of a continuous becoming and enactment of ethical and sustainable actions, Braidotti argues, does not happen alone or as a result of sheer will or social pressure. Considering humans as entangled in active assemblages of meaning and matter that can enhance or diminish capacities to act illustrates the importance of attending to what sorts of ‘coming to be’ (Barad 2007) that co-design materials are inspiring or discouraging.

Within co-design encounters, there are opportunities for learning, relating differently to others, and instances of enacting affirmative ethics through a mutual ‘coming to be’ between participants and materials. This comes about from intentional design decisions as well as in response to the quality of the materials themselves. An illustration of how this mode of working can enable an ethical response is discussed below in a moment from

the *Free to be Design Thinking Workshop* in Melbourne, 2016). This workshop started with data and stories about where young women in Melbourne felt safe or unsafe and worked through a process of brainstorming then modelling desired interventions as a way of allowing participants to quickly start imagining and working “within and beyond current situations” and altering “the perceptual outlook of decision-makers about possible futures” (Lenskjold et al 2015: 77). To support participants unfamiliar with modelling urban areas, paper city elements were designed, including things like public transportation, advertising, and signage for construction sites, fast food, cafes etc. The paper buildings, city elements and people enabled open-ended prototyping and the rearranging of elements in ways that were collaborative and iterative. Participants were encouraged to avoid getting hung up on the details of implementation, measurements or final forms. The mode of activity supported this since the paper elements and narrative building activity enabled a more playful modelling that encouraged learning through making as groups of diverse community members, social service workers and city officials debated what those futures would be like, and for whom they would feel safe. Rather than writing or drawing or having to decide upon one outcome, the intention behind the modelling materials was that they could encompass and elicit a range of perspectives, and ground discussion in specific details of lived experience and avoid hypotheticals. In this workshop, there was a group with a police officer and several younger women that put the performative and playful capacity of these materials to the test.



Amidst the making, a voice rises a bit in disagreement. Looking at the table with a police officer and the two young women, I’m picking up on some slight defensiveness as he explains to the young women at his table that the safety button on the train is there to alert the driver and summon help if riders are in a dangerous situation. Arms crossed, he is explaining that their hesitancy to travel late at night is unfounded and that what already exists should work for them, just like it works for him. He points to the paper model of a

train they are working with, indicating a little red button he has drawn that represents the safety button. As he points, the other young woman at the table speaks up saying “but no one I know actually uses that.” I start walking over, considering if I should intervene and what I might say as a facilitator.

The other young woman nods in agreement and starts explaining how she and her friends have learned to de-escalate and avoid conflict and that taking an obvious action would actually feel less safe. The safety measure that is currently implemented and seen as a solution to keep young women safe is being dismissed by the very audience it was intended to protect, but the policeman doesn’t argue any more. I can’t tell what he is thinking, but as he leans forward and watches the younger women arranging people in the train, he starts asking more questions about what they would do. He seems more curious than defensive and I can see he is still engaged and that the gears in his head are turning. (PN From Free to Be Melbourne 2016 Workshop)

Figure 44. Participants discuss a scenario taking place on a tram

In this interaction, we see the officer open to the sort of margin of manoeuvrability (Massumi 2014) that is thought in the act, not premeditated but made possible through this social-material encounter, which created conditions in which the police officer could become receptive to hearing about the young women’s experiences. In the whole group discussion at the end of this workshop, the officer shared that he would be going back to work asking different questions and that while he had been to a lot of workshops, he had never

been to one like this (*Free to Be Design Thinking Workshop*, Melbourne). Similar comments about personal realisations and unexpected learning were shared by others in the end discussion where individuals expressed their realisation of differences between their own experience and expectations and those of others, having a deeper understanding of the issues at stake, as well as personal realisations about what they can do personally or in their professional role. The impact of this experience lasted beyond the end of the workshop. A follow-up survey (2017) showed that participants who had not previously been engaging with issues about women's safety in urban spaces reported sharing the information discussed in the workshop with friends, colleagues, and being more aware of gender on perceptions of safety in urban spaces. Those working in the field already with some degree of experience shared "it allowed me to expand my thinking and I learnt a lot." (Participant feedback from follow-up survey 2017). These moments of learning and personal experience and reconciling one's own position with the unique and different lived experiences of others is important in the workshop as designers and non-designers aspire to create equitable futures for diverse people, many of whom have historically not been involved in the decision-making process.

Changes like these, in attitude, actions, ability to respond and ways of relating to others, can be thought of as forms of 'minor activism' through the co-design process, in which engagement in the design process and an inquiring attitude can reconfigure dominant conditions and norms (Lenskjold, Olanderand Halse 2015). Imminently generated through working with others and recognising one's own ability to act, this is reminiscent of the sort of "implicit activism," that Horton and Kraftl (2009) have advocated for as preconditions for social change. Actions like asking different questions, validating and empathising with others' lived experiences, and recognising one's own positionality are the sorts of things that are personal, quotidian, and may be deemed too minor, or insignificant to count as activism, yet are the necessary preconditions for action as they allow people to care (Horton and Kraftl 2009). The ability to respond in ways that are ethical can come about through co-design engagements that welcome conflicting views and hold space for difference¹⁰. This can be catalysed through making activities that not only problem-solve or make visible, but engage participants in, as Braidotti would say, "affirmative becoming-in intimate with the world, with otherness and diversity" (2018, p. 12).

In describing the minor activism that can come about from designing, Lenskjold, Olanderand Halse (2015) claim it "pertains to the actions by which participants and designers, collectively, if only ever so slightly, alter the dominant conditions of the design process" (71). While they acknowledge that co-design materials can be generative tools to help participants inquire into existing conditions and speculate about alternatives, in this inquiry I go further, and frame materials as active participants. I propose an understanding of co-design materials as 'technologies'; as a way of attuning to the way they help create the possibility to alter the dominant design condition, as well as actively take part in this becoming-with. One way to examine this is through looking at what different materials made possible within the same workshop.

6.4 Doing Diversity

In the 2019 workshop with Moreland City Council hosted by Monash University's XYX Lab, 50 council members, public sector employees, and several community members were brought together to discuss how proposed changes to parking and transportation would increase or decrease safety for women in the community. Beyond coming up with solutions, the workshop was identified as an opportunity for council employees to learn about gender sensitive design, and consisted of an informative presentation, a modelling activity that put learning into action, and a closing activity that encouraged personal reflection on how this way of working could be taken forward. This end activity in which participants constructed their own 'gender lens' was designed to catalyse learning from the modelling activity and will be discussed further, later in this section.

¹⁰ Ethical is again used here in the way that Braidotti, thinking with Spinoza, refers to increased capacities to act and the sustainability or endurance of these actions. While Braidotti's transformative ethics require a radical repositioning of the human subject and these workshops did not delve into more than human relations, in a very basic way we can see the principles of an affirmative ethics being enacted.

To interrogate how materials were actively making both different outcomes and ways of working possible, for the modelling activity half of the groups received specially made paper people that were intentionally diverse. These paper people came in different sizes and skin colours, and had been developed and refined over several workshops to have a wide range of accessories that signalled diversity and difference, such as walkers, baby strollers, rainbow flags and a variety of hairstyles. The other half of the tables received blank people they had to fill in themselves. While every other aspect of the workshop was the same, the differences in how groups were working was evident after only a few minutes.



Figure 45. Blank People and city elements



Figure 46. Diverse People and city elements

Even though I have come to realise the value of these workshops is about much more than how the participant made artefacts look, I can't help but feel like I have set some of the groups up with a much harder task as city models with blank people look unrefined and fall flat compared to the vibrantly coloured stories unfolding in the models with diverse paper people. All the groups are talking and moving paper elements around, but just from looking at the models with the colourful paper people it is easy to assume they are ahead in thinking about who these spaces are for. One of the groups still has totally blank people, and I worry the conversations are more about the practicalities of the built environment than considering the diversity of the community they serve. There is a member of the research lab at each table facilitating the conversation so I don't want to be too obvious that I am checking on the groups, but as I walk by a table with diverse paper people where they are debating the skin colour of a Protective Services Officer, and the importance of flags and symbols to signal safety, I realise how little the blank people do to help facilitate these conversations. I hope that the designers and architects at those tables are comfortable picking up the slack and making sure these conversations happen, and that participants are asking questions about what inclusion looks like and how to consider diverse needs without the provocation or permission from the materials. (Excerpt from Practice Narrative about workshop #8).

Looking at the outputs being produced, it became clear my concerns were justified. All the groups had been asked to write down the main ideas or considerations they discussed. The groups with bespoke paper people included ideas for “community”, “inclusion”, “visibility”, and “acceptance” as written ideas. The models showcased not only the diverse ethnicities and flags provided, but also handmade posters, posed interactions between people with visible differences, and speech bubbles adding to the story and showing considerations for who was in the space. However, none of the groups working with the blank paper people included these terms in their ideas, nor had obvious interventions geared towards different types of community members, just indications for use such as bikes, cars, pedestrians. This difference in what was produced is important since it is these written down ideas that go into the final return report for the council, and indicate what groups felt were key ideas and important to this discussion. The participants' artefacts also revealed differences in how

they informed the end report, with the blank ones appearing more incomplete and needing an explanation to make sense of, while the colourful and visibly diverse cities told a story on their own and looked like the sort of outputs one might expect from a workshop about inclusive spaces. Unsurprisingly, the work of documentation that the diverse people performed was so good that a few participants working with the blank people came over to take photographs, and they were used more frequently in the return report, portraying a certain image of the sort of issues the city council was addressing.

For the participants, what became possible to discuss during the process of making was different as well. In a follow up interview, Participant N, who had worked with the blank people, described a moment in the making when she brought up a point about how people from different cultures have different experiences. She shared how her line of questioning was shot down by someone at their table who said, “that doesn’t matter, that’s not what we’re doing”. The blank people lacked the capacity to prompt conversations in the same way as the diverse people did. As a pedagogical tool to encourage people to consider *who* spaces are for, and ask different questions, they required more facilitation and intervention from team members to step in and encourage considering people of different lived experiences. This doesn’t mean they were unagential or ineffectual. While the creative effort required to draw features was sometimes a barrier (see figure 47) when features were drawn on, they were more intentional and revealed more about underlying attitudes (see figure 48). As a litmus test, they revealed opinions and stereotypes about who should be protected, like the woman who was drawn with blonde hair and blue eyes who was coming home from work. Left unchallenged, this mode of making could enforce dominant narratives and give the impression to council members they are adequately considering diverse needs.

The group working with the intentionally diverse people however did not have the same issues, since as ‘tools’ the materials were framing what was in scope and through their design, suggested that things like ethnicity, ability and gender were central to the activity. As ‘toys’, the bespoke paper people invoked past associations with paper dolls, (something that was especially commented on in Workshop 3 which used a similar set of diverse paper people). While this set required more attention to detail, it invited more of a story and made different considerations and ways of working possible. As described by participant E, “I could actually add elements to that and say like, ‘oh, what if there are a parent and child walking down here?’”. The ability of the materials to advocate for diversity eased the work of facilitation and relieved people from having to be champions for issues, since it was possible to put in a different paper person and start discussing how their experience might be different. But what did these materials actually make possible? Besides the different outputs, did this act of making actually enable implicit activism and learning? Or do the outcomes portray a more progressive vision that is more aligned with the desires of the designer than the will of the council members?



Figure 47. Blank people proved to be a barrier to considering characteristics and differences in experiences



Figure 48. Blank people made visible underlying assumptions



Figure 49. People with accessories and skin colour invited discussions about visibility and diversity



Figure 50. The intentionally diverse sets of people created a rhetorically strong image of diversity and inclusion that doesn't necessarily represent the attitudes of the council-members

6.5 Performativity and Applause

In these encounters, participants had a choice. After all, technologies don't *make* people do things (Davis 2020). Participants had the choice to exclude certain skin colours or to not include flags or mobility aids. There was nothing about the paper people that demanded the groups write final ideas about inclusion and community and ways of signalling inclusion via visible signage. These materials do, however, “push, pull, enable, and constrain” (ibid, p. 17). Beyond scaffolding thinking and framing the problem, the intentionally diverse people functioned as a technology for performing diversity work. They not only invited different considerations, but made it actively harder to *not* discuss race, gender, and the politics of spaces. In viewing this as a material-discursive phenomenon we can see that “within a specific space with specific other human and non-human organisms, matter will regulate how and what we might say or do, or not say or do” (Lenz Taguchi 2010, p. 5). In considering how these materials act as technologies, I extend this argument to examine how materials make it easier to perform certain ways of working, to create certain outcomes, and the political implications of this making-with and becoming-with.

In considering how this performance matters, I am thinking with Ingold as Akama and Prendiville (2016) have, when they frame co-designing as “a journey and process of transformation in how we design our world, and ourselves, with others” (31). In the Moreland City Council workshop, this performance could be thought of as a kind of ‘becoming’ activity (Butler 1997 in Barad 2007) facilitated by the co-design materials as subtle regulators that indicated diversity and difference were important and guided the creation of certain models of the future that embody this diversity. Following this material-discursive understanding, the council members’ performance was a rehearsal of more inclusive and creative ways of working. The workshop resulted in council members discussing the need to involve more people from the community in decision making, as well as personal realisations about their position, like participant C’s commitment to “get others’ views because I’m aware now that I’m looking at it from one angle, and it’s not necessarily the correct angle. It’s not a wrong angle. It’s just it’s not the full picture.” (Participant C, Moreland Interviews 2019). His realisation speaks to a recognition of positionality, and a sense of becoming more invested in hearing from diverse voices. He saw this move to incorporate others’ opinions as supported by his organisation since they had made him go to the workshop, and he saw the beneficial effects first hand as he received feedback about ideas and had seen his colleagues around the room working in this manner.

This has implications for what becomes normalised and possible for the organisation more broadly as well. The images of rainbow flags and children in a grassy area gained momentum and were shared more than blank people and the less idealistic future of Moreland they inspired. These images that appeared diverse and inclusive were used as the cover on the report that was made about this workshop, and imply a certain type of progress is being advocated for at this council. On one hand, this makes it possible for more of this work to

continue. For participant E, as a result of this workshop, she shared that she now felt this new workplace cared about issues of inclusion and gender equity, and she felt encouraged that she could talk to some of the people who had been at the workshop about these sorts of issues (Moreland Interviews 2019).

However, as Ahmed and Swan warn, “technologies of ‘showcasing’ can lead to an economy of affect in which pride, celebration, and upbeat performances hide the frustrations, anger, tensions and disappointment of living with the effects of diversity work” (2016: 98). In trying to create affirming and engaging experiences that avoid alienation and that encourage this sort of modelling and imagining of more equitable futures, these workshops can gloss over difference and hesitancy. The documented artefacts can make it seem like employees are in agreement about desired futures, and creates a story that the organisation is more progressive, proactively engaging in work which it is in fact not committed to or necessarily capable of following through. This in effect hides the lack of action or agreement towards the ultimate outcomes and long term impacts through overly curated outputs and models.

In the story of two different paper people, skilled facilitators could leverage the ability of the blank people to surface assumptions and could create space for powerful un/learning. By making the case for thinking of these materials as technologies I argue that designers/researchers/facilitators and participants alike need to be acknowledging the way materials are enabling certain ways of becoming and working together. This is both to enable learning from collaborative and affirmative ways of co-producing our future, as well as to prevent the appearance that certain progressive work is being performed, when in reality the materials are doing the work or creating the illusion of work being done. Looking at the outputs that are documented (discussed previously in the consideration of materials as tools), does not always accurately represent the learnings that were surfaced in the process. While designers are accustomed to designing materials that visually represent and scaffold the problem and get participants to a certain outcome, thinking of them more as ‘technologies’ that enable a ‘becoming-with’ leverages a currently overlooked dimension of material agency and better acknowledges the ways we are making, learning, and becoming with these materials .

6.6 Pedagogies for becoming with

As Haraway claims, earthlings are never alone and are always coming into being with more than human others (2016, p. 58). Accepting this mutual and more than human ‘making with’, or *simpoesis*, the materials being employed in these encounters start to matter not only in the models or futures they are helping produce, but the mode of ‘becoming with’ that is made possible through the *simpoesis* of some co-design encounters. Akama (2015) calls for awareness of this sense of becoming and introduces the Japanese philosophy of ‘Ma’ to attune to emergence and changes that come from this tacit and embodied process, what she frames as the “betweenness” (264) in this networking of actors both human and non-human. For the co-design practitioner, this orientation moves away from designing materials to document or create a rhetorical argument for innovation. It asks designers to attune to the possibilities beyond post-its and sharpies, and to imagine co-design workshops that enable designing as an ongoing verb and as a creative and relational act. There is then an imperative to attend to the selection or design of these materials not just as a tool to make visible or a toy to engage, but for the affirmative instances of becoming ethical they can enable.

This could be thought of as attuning to emergent and unexpected qualities and responding to them, as Akama (2015) suggests. But I argue it also suggests an opportunity to bring pedagogical approaches into co-design workshops in order to more intentionally leverage their capacity for transformative learning and ‘becoming with’ materials. In transformative learning, the learner is supported through surfacing and challenging mental models (Mezirow 1997; Grocott et.al 2019) so the learning results in a shift in not only how the learner thinks, but also acts and is capable of responding in the world (Freire 1970 in Grocott et. al. 2019). This approach to learning with and becoming with materials isn’t as much about teaching or instructing as it is about enacting pedagogy as a ‘worlding practice’ (Juelskjær 2019). When encountered with a materialist lens, there are new questions as to “‘who’ is teaching ‘whom’ ‘what’ and ‘how’.” (ibid, p. 59).

In my own practice, recognising the untapped pedagogical potential of these co-design materials resulted in more time for reflections where we were debriefing less about *what* was designed, and more about *how* it was designed and what the process was like. In the Moreland City Council workshop (#8) the paper tetrahedrons and kits of scissors and markers deliberately situated participants in a creative and collaborative approach to problem solving. The city elements and story prompts were employed as ‘tools’ to frame the problem and indicate a hands-on way of working. As participants accepted the invitation of the playful paper people ‘toys’ they created multiple ideas, provided and received vital feedback and had assumptions challenged by others at their table, and ultimately became able to perform responsive and unplanned thoughts in the act (Massumi & Manning 2014). These were witnessed as people picked up material such as the rainbow flag, then started having different discussions about inclusion and diversity instead of more technical concerns like the ones about distances between station and sidewalk that Participant C had expressed he was expecting to talk about. As ‘technologies’, the blank paper people made it possible to surface and discuss assumptions about who deserves to feel safe in public spaces, and who perpetuates harassment. Conversely, diverse people provoked conversations about difference and inclusion, as well as creating visual artefacts that went on to tell a story about how the council values diversity, and actively seeks solutions to address the different needs of the communities they serve. The opportunity for learning was then nurtured by the introduction of one last activity, a reflective gender lens activity.

To assist these conversations about learning for the Moreland City Council workshop (#8), I designed a reflection booklet that leveraged the ability of images to evoke insights and spark conversations. While the back page of the booklet had recommendations that were research-based and developed in consultation with Monash University’s XYX Lab, the main focus of this activity was participants’ reflection on their experience in the modelling exercise, articulating questions and considerations they were privileging while working, and planning actions they could take to further develop this way of thinking. There were assorted transparent lenses that slotted into the booklet and that acted as metaphors for their personal perspective on gender; namely the particular way of designing and asking questions they had engaged during the workshop. By designing this end reflection activity I was able to express to both the participants and the organisation that making a more ideal city does not happen in a one-off co-design workshop, but by applying this more empathetic and curious way of learning about others across the organisation in day to day operations. The booklet contained some information distilled from the earlier presentation by XYX Lab about feminist design ideals, as well as space to write individual reflections.



Figure 51. The reflective gender lens booklet



Figure 52. visual metaphors of lenses to consider how gender as a lens could be applied and further developed.

All but three individuals in the fifty person workshop took their booklets with them, and when interviewed four months later, several people said they either had them on their desk at work or had shown other colleagues. I would argue that the material invitation to explore different figurations and im/possibilities enabled a becoming with otherness and diversity (Braidotti 2017), and thus we can see how this affectively-charged process supported personal realisation, the posing of different questions, and an increased understanding of how applying a gender lens could be relevant to participants' work. In seeing how this increased understanding and capacity for action carried beyond the workshop, it becomes clear that not only did the materially-mediated activities help participants engage in the issues being discussed, but there was also something about this workshop that stuck with them. When considering these materials as 'technologies' for enabling certain ways of working and even becoming, 'stickiness' is a useful concept to explain why materials have the agency to look in closer detail at what is being made possible.

6.7 Stickiness

Stickiness evokes many things, from the sort of 'sticky learning' in Neuroscience that explains how learning stays with us beyond the learning encounter and shapes the brain (Medina 2008); to a more affective understanding of 'sticky learning' (Mulcahy 2016, p. 208) that is in keeping with the new materialist conception of material agency and the questioning of what these assemblages are making possible. Following this new materialist inquiry, this stickiness can be thought of as a condition that is enabled through engagement with the co-design materials.

To learn in ways that are personally relevant and build a capacity to act, let alone become, there needs to be something about the experience that sticks. However, such an openness and willingness to be affected is not usually our default state, given the sensed precarity of our future, (Guattari 1995 in Coats 2020; Braidotti 2019). Guattari condemns what he describes as "the existential smoothness of current times" (Guattari, 1995, 2005 in Coats 2020). This condition is strengthened through neoliberal demands for efficiency and desire for instant gratification, leading to an aversion to the "pain of affective connection" which results in an "unimpeded flow of familiar, shallow, and recurrent interactions" (p. 17). To resist this "slippery sheen" it is necessary to become 'sticky.' Such stickiness is described by Ahmed as synonymous with affect (2010)¹¹ and by Coats (2020) as an active disposition, becoming primed for response and response-ability (Haraway 2006).

¹¹ Ahmed argues that affect is a form of stickiness (2010, p. 30), again, arguing against Massumi's distinction between affect and emotion but useful here for her direct theorisation about sticky objects.

This increased ability to respond is transformative in the sense that, in responding, we gain new capacity for action, almost like a rehearsal or practice. As Anna Tsing explains, “[r]esponse always takes us somewhere new; we are not quite ourselves anymore—or at least the selves we were, but rather ourselves in encounter with another. Encounters are, by their nature, indeterminate; we are unpredictably transformed” (2017: 46). These materially rich workshops that are future-orientated not only produce ideas and outcomes, but can produce conditions of stickiness, of being able to stay with the trouble and engage in issues one otherwise might opt out of responding to, or assume doesn’t have much to do with them, as many council members had indicated prior to the Moreland City Council workshop (#8).

Ahmed describes that such stickiness can coalesce around objects. Associations, both historical and emergent, individually felt or more socially constructed cause objects to gain stickiness, which she equates to affectivity. She says “things are already in place that incline us to be affected in some ways more than others” (reference). While the specific affect or effects of this encounter are indeterminable in advance, there are material tendencies. Recalling the previous discussion of how materials as ‘tools’ can act to situate participants in this mode of making (section 4.2), and engage in embodied and intrinsically motivated, even playful and exploratory ways (section 4.3) I propose ‘technologies’ as a frame through which to consider this stickiness and attend to the learning and becoming that is being enabled or constrained by the material co-facilitators.

In thinking about how materials might enable stickiness, the ethos of material selection becomes a design element and important factor. Such an example of what materials made possible beyond the immediate workshop is described below, in an example from the Playtank Workshop for AARE 2019 (#9). Consisting of 16 people who were mostly in education and academia, the workshop was intended to create space for not only discussing but actually enacting ways of doing research differently. Participants individually mapped research assemblages, then collaboratively chose players to enter the shared space of the ‘playground’ a board signalled by laser cut signage and three printed ‘playground rules’ that encouraged taking turns, avoiding colonising others’ ideas, and holding space for plurality of meaning and relation as more ideal research assemblages were imagined.

The workshop moved away from templates that scaffold the design thinking process and valued a more playful and emergent process of collaborative making and the creation of the mutual playground of academic actors. This making was encouraged through three different levels of considering research assemblages, from a micro, intermezzo and macro scale. Each sequential stage was accompanied by evocative background theory that was read to frame the considerations and a new material introduced to co-facilitate. For example, the three dimensional paper blocks that came out for the final macro discussion of power and hierarchies, facilitated conversations about building up, flattening, rising above and equalising. While this was scaffolded, it was not prescriptive, as the materials selected to participate were purposefully abstract and open to groups’ interpretations. The playdough and shapes were so ambiguous that even within table groups, dots or circles or blocks meant different things, and adopted new meaning and relations as they transitioned from individually created arrangements to the shared playground. This variability and un-fixedness was welcomed, and explicitly addressed through the playground rules encouraging a plurality of meaning and new relations. The non-representative nature meant that while every group had the same materials, they ended up in different configurations and relations. Each group had a different defining feature about their model that was not premeditated or facilitated, but emerged as groups made with each other and with the material co-facilitators and furniture around them.

Some groups had hidden elements dangling below the desks, some used the string to suspend and sway, and one group had created a sort of catapult to express the trajectory and aliveness of what they were discussing more than a static model could. What every group did agree upon, however, was that in working with the materials within the magic circle of this play tank, they felt rejuvenated, had lots of ideas about how they wanted to be thinking of research collaborations in the future, and they thanked us as the human facilitators and our material co-facilitators for making the experience possible. As the workshop concluded, the

considerations for what happens to the materials after the workshop became the most important consideration of all.

Figure 53. Re-usable, recyclable, or compostable materials used for Playtank



Starting to tidy up as groups finished the last activity, I noticed someone grabbing the trashcan to help me. I had to jump in and explain that actually, all the materials were recyclable, reusable, and the playdough was going to be composted. In minimising our material impact, we were thinking differently about what we brought with us, opting for things that were more ambiguous and open-ended that people could use in different ways, and forgoing some of the more disposable alternatives that were brainstormed early on. I hadn't expected it to make a difference to the participants, and as such, I hadn't thought to articulate the care and decision making that went into selecting these materials. As a designer, I was so used to swooping in with my bags of brightly coloured and enchanting, exciting materials, sharing my toys through carefully curated play, then cleaning up after the

participants had left.

I always felt too much like a kindergarten teacher asking participants to help clean up and tidy their tables, and it disturbed the flow at the end of the workshop as participants were usually talking about things that came up and using the time to exchange emails. So I was surprised at the room wide attention to my casual comment. The pause as paper about to be crumpled up and thrown away was gently placed flat. The attention with which groups started separating and sorting out the various materials. Within just a few minutes the playdough had been balled, materials returned, and tables cleared. Less of a classroom clean up and more of a closing ceremony, this unscripted end to the workshop was more meaningful than I could have initially imagined, and the very fact it was un facilitated made it feel all the more collaborative. (Practice Narrative from Workshop 9)

Playing with and making with each other and these carefully curated and sustainably produced materials cultivated ways of working that were more pedagogically effective than just discussing the sort of ethical and relational researchers the workshop was about. Instead of detailing what was talked about or describing the outputs, the conversations tended towards sharing how it felt to actually work together differently, suggesting an awareness and excitement at the increased capacity for ethical action that can result from these affectively charged and sticky pedagogical experiences (Healy & Mulcahy 2020). Our considerations for how the workshop materials were selected, introduced, and importantly, composted and reused after the workshop, was commented upon several times to murmurs of agreement and several tweets about the refreshing ethics of such an engagement, and promoting this session as an example of putting ethics from new materialism into practice. Beyond what was learned or realised from discussions with other people and the opportunity to reflect on research practises, working with materials in this sustainable way created a space to practice and experience ways of working that were affirming and enabled becoming researchers in collaborative ways with more than human others.

When viewed as 'technologies' that are sticky with affective potential materials can perform in ways that are more emergent and pedagogically affective, enabling a performance of design, rather than prescribing the next step in a design procedure. This framing leverages the associations and emotions people have around certain materials, and means that as co-design is applied to movements seeing equitable and sustainable futures, the materials used matter even more.

6.8 Material Ethics

Melbourne Design Week workshop conducted with Ilya Fridman, exploring co-design materials for climate action. Intentionally framed as co-facilitators, there were four different sets of materials that participants cycled through making with. At the table with natural materials, one person shared although she felt angry, she didn't want to crumple the stalk of grass, and others described feeling revenant and appreciative, respectful. At a table with evocative images, participants tended towards sorting, sharing how the images were making them feel or what they associated with the images, and finding meaning through the categorisation or ordering into stories. Where participants had bespoke paper shapes, they were creating scenes and stories, sometimes doing a bad and good version, and speaking about what the shapes represented to them. At the table with playdough, it wasn't just the playful potential or squishiness of the playdough, but the quality of being homemade that captured the participants' attention.

T: I think it has such a strong impact, I mean, I was thinking of a lot of these workshops I've gone to, these design workshops, they love bringing out the Lego, so you can build something symbolic of 'xyz'. But it's completely different to sit down at a table with those Lego blocks because of the nature of the materials, it's restricted by how it fastens together. etc.

L: It's almost capitalist in itself isn't it? Because there is something about it that is so, like, scale and building and interlocking

(Several minutes passed in which they discuss what they are doing with the playdough)

T: It's soothing though...

L: It's funny, because you're critiquing Lego, but if we were playing with playdough Alli hadn't made I wonder if we'd feel the same way?

L: Right? because we all picked it up and our immediate response is like, how nice it feels, and I don't think we would have said that if we were playing with synthetic playdough. And there is care built into it so it's kinda like...

C: It's so soothing, it smells nice—

T: And it's unexpected because to see home playdough, when we're so used to store-bought playdough you're like, oh, I'm intrigued, this doesn't look like what I'm used to looking at.

Considering materials through the dimension of 'technologies,' it becomes clear the material qualities and contextual associations such as being handmade, carefully produced, and sustainable, enabled different capacities to respond and be affected. I argue that roughness and messiness, and valuing the longer-term impact of these materials over the more sugar-coated and commercialised materials, contributed to an ethics of working that was appreciated by participants and that expressed a form of designerly care. This care was different to the hours spent laser cutting and carefully designing workshop agendas. Whereas the designed materials such as glossy printed materials that are consistently branded and well-designed agendas and signage can indeed situate participants in a workshop, so too can more low fidelity and handmade materials. However, in this situation, there can be different resonances with ways of working that are careful. Bringing material co-facilitators that are ethically aligned with the objectives of the day can be one way of increasing the capacity to respond, and to enable the sort of response-ability that emerges "through the immanent relationship in-between everything in the encounters (Lenz-Taguchi 2011, p. 48). Thus, creating conditions in which participants can rehearse behaviours, come to grips with their own thinking/feeling and ability to act allows for this increased ability to respond. We can better consider the pedagogical implications of what these workshops encourage participants to realise and feel, and consider whether we want the takeaway to be that we should make more things to solve social problems, or if we want participants to leave with a different capacity to create relationships and ways of working that recognise difference and that "we are in this together but we are not one and the same" (Braidotti 2019, p. 52). It changes the production of workshops from outcomes, to enactments.

In recognising the agentic potential of materials in this way, our concern as designers shifts from getting participants through a series of steps, to being more open and receptive to what emerges, and what is

becoming possible by and through the materials we incorporate into workshop encounters. Lenz Taguchi (2011) refers to this in relation to the pedagogic potential of materials in a space, arguing that the consequence of acknowledging material agency is that:

[We] need to become aware of how the room, space, time and things are organised and structured, and what kinds of intra-action between different organisms and matter might be possible. S/he needs to be ready for the kinds of learning that emerge in the rhizomatic movement that can take multiple directions and that is an effect of multiple intra-activities, expressions and modalities beyond the traditional spoken and written word. S/he needs to welcome the transformative singularities of what [we] continuously become. (2011, p. 47)

This reframing of what materials make possible and let us do or become reframes the role of the co-designer, especially in contexts that are concerned with social equity and are not, in fact, trying to design an object or service. Understanding this ability of the materials to signal ways of working but also enable ways of becoming ethical expands not only our responsibility as designers to sustainably enable future generations' agency (Gatt and Ingold 2013), but also our response-ability (Haraway 2008), the ability to respond that takes into account the ethical thinking-doing that makes up the "iterative co-becomings of the world" (Healy 2019). Such a conception progresses the act of facilitation beyond framing the purpose of a workshop, providing directions for the activities, demonstrating how to use the materials, keeping time and making sure everyone has an invitation to participate. This situates the workshop as more than a period of time to come together and problem-solve, and the work of a designer as more than getting to the outcome.

Discussing the duty of humans, Robin Wall Kimmerer offers the revelation, "[i]f gifts and responsibilities are one, then asking 'what is our responsibility?' is the same as asking 'what is our gift?'" (Kimmerer 2013). Following this way of working with, facilitating with, and ultimately 'becoming with' materials leverages the strengths of designing, and offers both a responsibility and a gift. It enables practices that prioritise attunements to how we create with what we have, work in relational ways, and continuously become more ethical and sustainable as we not only problem solve but rehearse ways of working and gain capacities through these encounters. More considerations from the framework and ways it can be put into action are discussed next in Part Three.

Part Three

Part One framed my research question: "how can the role of co-design tools be reframed when entangled with feminist new materialist theories?" Part of which was the inquiry "how does feminist new materialism enable different ways of thinking about materials?"

Part Two addressed these questions by proposing a conceptual framework that positioned co-design tools as agential things and detailed three dimensions of this agency — tools, toys, and technologies — in order for designers to be able to access this way of thinking about material agency and relating to materials as active participants or even co-facilitators.

Now in **Part Three** I address the last part of my question, "what considerations does this make possible for co-design workshops?" This is addressed by discussing considerations for practice based upon my proposal of a more relational approach to working with materials. In this section I also offer several conclusions that can be drawn from this research regarding the relationship between post-qualitative and practice-based research, as well as implications for practice and directions for future research as design shifts from a human-centred approach to a participant-centred approach that acknowledges the agency of more-than-human others.

7. Considerations for Practice

This section discusses considerations that are enabled by the framework I proposed in chapters 3-6.

Firstly I suggest considerations enabled by the positioning of co-design materials as agentic ‘things’ within assemblages. Secondly I elaborate upon the dimensions of material agency illuminated through ‘tools’, ‘toys’, and ‘technologies.’ Lastly, I discuss how these considerations translate to online spaces.

Putting the Framework to Work

It is important to remember Light and Akama’s (2012) argument that the appropriate object of analysis for discussion about participatory design research is not the method or the designer but “the designer using the method.” They continue, “it is not meaningful to separate the designer from the method since we cannot know participative methods without the person or people enacting them.” (p. 3). They warn that there is a tradition of reporting that skirts personal and professional dynamics in favour of a focus on more systematic aspects of designing, such as technique, and there is a tendency to isolate these aspects to render them more reproducible, such as Sanders et al’s (2010) matrix of tools, techniques, methods and approaches. Such guidance has value to inspire designers, but its neat ranks can also serve to suggest there are off-the-shelf activities that need no performance (Light & Akama 2012).

In proposing this theoretical framework I do not imagine a contribution to knowledge that is categorical and judgemental, or ‘sedentary’ (Mcclure 2013). Attempts to constrain and predict what role might be played by co-design materials is indeed against Bennet’s (2010) proposition of vibrant matter being “quasi agents or forces with trajectories, propensities, or tendencies of their own.”(p.8). In acknowledging the situated and relational nature of material agency, these considerations for practice that flesh out the proposed framework are offered as wayfinding mechanisms and as ways of sense making and storytelling as we navigate a more participant centred approach that acknowledges the active participation of these materials. This both requires and invites re-interpretation as well as additional contributions as practitioners put these ideas back to work.

Firstly, the framing of things widens the attention to intra-acting factors, expanding the range of attention beyond interactions between people and materials, to attend to the ‘material-affective- semiotic entanglements’ (Osgood & Giugni 2015) that are catalysing or inhibiting material agency.

7.1 Designing with assemblages of ‘things’

In reconceptualising the role of co-design materials as ‘things’ this research accepted an understanding of agency as intra-active and relational (Barad 2003). As revealed in Chapter 3 *Framing Co-Design Materials as Things*, the role that materials have the potential to play is in relation to what the participant is bringing with them in such material-affective-semiotic entanglements (Osgood and Guigni 2015). Everyone engaging in a workshop brings with them a rich, ever-evolving history of experiences, expectations and relationships that entangle in the co-design assemblage and influence the possible roles played by the materials as well as what is being made possible in the encounter. This means that mapping, yet alone attempts to predict the full entanglement for each person, group of participants or workshop, is not only unhelpful but impossible since the affective potential of the cultural, somatic, technical and historical “cannot be separated into distinct or discrete categories.” (Ash 2015:86).

However, the positioning of ‘things’ does call for a broader attention and consideration of potential factors that would catalyse or inhibit material agency. While tracing and examining the affective capacities of assemblages of people and materials that is enabled by the positioning of ‘things,’ there are components that designers can

attend to that are influential in the assemblages, beyond even the socio-material considerations. While conceptions such as Sanders' framework for organising the tools and techniques of Co-Design (2010) offer a starting point based upon predicted or desired outcomes, and the oft-cited *Convivial Toolbox* (Sanders and Stappers 2012) offers practical and pragmatic considerations such as table space, documentation and assembly of toolkits, what I offer here is an expanded way to consider the elements and aspects of a workshop that could catalyse or diminish material agency within workshop assemblages. Considering co-design materials as 'things' asks designers to broaden the focus of their attention and practice beyond how they anticipate materials being used, to instead think about what will catalyse the material agency, and what affects the assemblage might produce for not only the problem at hand, but participants, organisations, and futures at stake.

These considerations for working with 'things' as parts of assemblages deal more with what participants are arriving in the workshop with, such as attitudes, perceptions and beliefs; as well as more structural or institutional factors. These are arranged below on a scale from pre-personal and more internal and individually held, through to relational concerns between participants and transpersonal concerns beyond the people and ideas in the workshop, loosely following Diana Coole's spectrum of agency (2005). This was chosen in order to encourage attention to intra-acting factors affecting material agency that accompany the conceptualisation of 'things.'

For example, by acknowledging the varied pre-personal assumptions and personal expectations participants are bringing into a workshop, more time might be spent setting up or even negotiating workshop objectives and ways of working as a group instead of in advance of a session. In an environment where participants might feel craft does not belong in a workplace or is inappropriate for serious topics, discussing the type of social learning and showing an action learning cycle could add rigour and reduce scepticism. Introductory activities might be discussed and debriefed more to build up creative confidence and demonstrate learning through doing. Suggesting various ways to contribute to a group might alleviate pressure and enable collaboration for those unused to working in this way. These considerations become increasingly important as the complexity of material making and creative demand on participants increases.

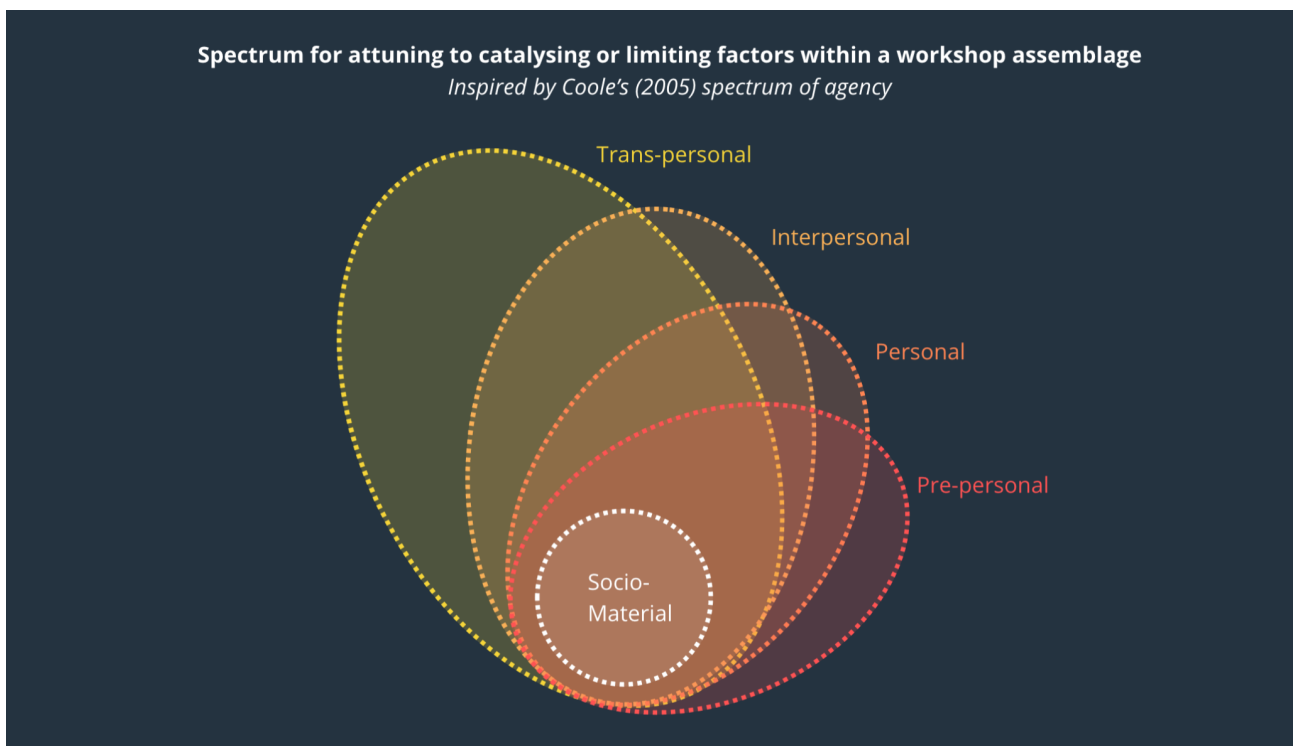


Figure 54. Spectrum for considering influential factors within a workshop

While Coole's (2005) spectrum, previously discussed in section 3.1 'Framing co-design materials as things', is not visualised in her work and is intentionally less distinctly classified, it becomes useful for considering elements that impact material agency. In this discussion about what considerations this framework enables in practice, my framing of 'things' suggests four lenses through which designers can preemptively consider potential factors, or can reflectively list factors in order to strengthen the attunement to aspects besides the materials and solutions that design has disciplined our attention towards. One example of a listing activity enabled by this shown below. This is an example that was done after Moreland City Council Workshop (#8) and has since been used to consider how to introduce materials to catalyse material agency by considering factors beyond directions for how the materials will be used in certain activities.



Figure 55. Considerations of intra-acting factors for workshop 8

7.2 Navigating beyond and within the framework

Secondly, within this broader conception of co-design ‘things’ acting within assemblages, there become more ways of considering what is asked of materials. In order to offer guidance without constraint, several considerations are visualised here and discussed more in the exhibition. In order to provide a starting point from which to interrogate practice and inspire ways of thinking about material agency through the dimensions proposed, I offer certain illuminated and labelled points that stood out as particularly valuable and helpful in designing with material agency and that, in the writing of practice narratives and the theoretical discussion of this framework ‘glowed.’ (McClure 2013). This glow is described as affective as well as an “account of the emergence of sense in encounters” (McClure 2013: 661). As I wrote practice narratives and proposed dimensions through which to consider materials agency, these points of practice illuminated aspects of my practice as well as suggesting ways forward as I worked with this new relationship to materials as co-facilitators. This re-presentation using a metaphor of constellations allows for discussion without claiming to represent, and allows for the necessary entanglement of the threads of relationality, interactivity, affectivity, and performativity that are inherent to practice and enacting theory (Healy 2019). Like real constellations, these are intended to change with perspective, time and cultural associations. These points of practice guide fellow travellers through considerations that were revealed through the three proposed dimensions of material agency.

The figure below offers some starting constellations which are further elaborated upon in my exhibition at www.alliedwards.com, and are enacted and expanded upon through an online workshop celebrating the launch of the exhibition, which is also documented on the website.



Figure 55. Points of practice as constellations

Beyond broad categorisations of material agency under ‘toys’ or ‘technologies’ these pointes of practice expand the repertoire of considerations while offering a more participant-centred co-design approach that catalyses the capacities of all participants, human and non-human. By navigating between these, it becomes possible to consider multiple perspectives of agentic capacity, and adjust facilitation and design.

For example, considering the different materials in the *Co-Design Materials for Climate Action Design Week 2021 Workshop*. The constellation created reveals how these paper figures were mainly intended to help sensitise participants through the suggestion of flames, trees, grey or blue clouds and buildings. The stories were individual, with meaning that was created between the materials and the individual, and selectively shared. The material facilitated an exploration of ideas as people created stories, before and after scenes, and mapped out emotions regarding climate change.

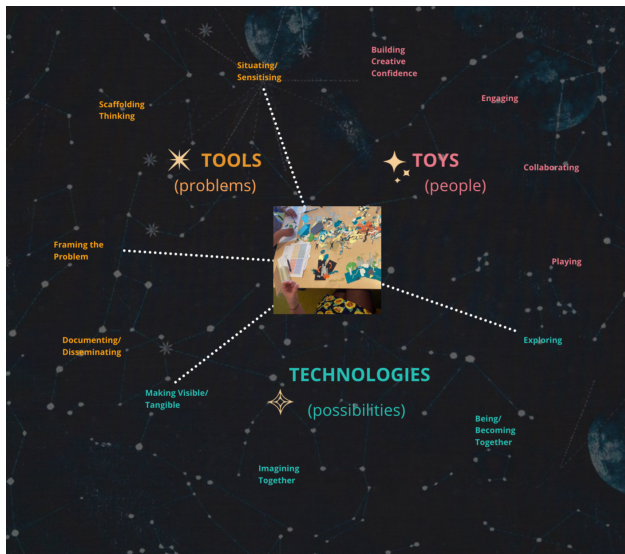


Figure 56. Constellation for paper elements

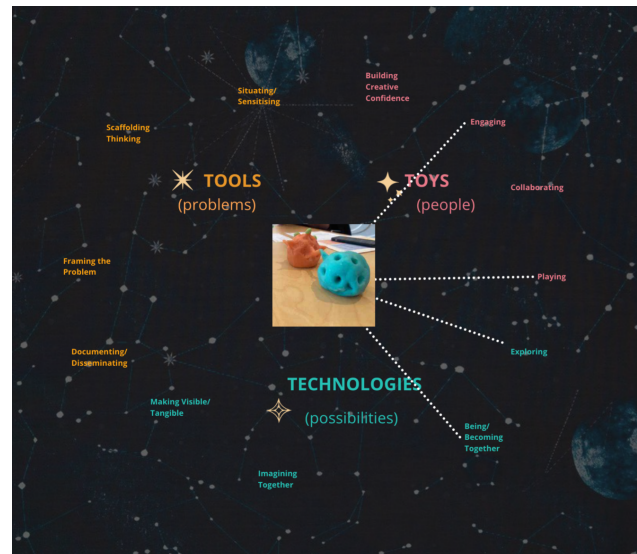


Figure 57. Constellation for Playdough

The playdough, on the other hand, performed more like a toy, engaging people in multisensory play as they stretched, poked and squished. Participants were less concerned with problem framing and discussed more about how it was letting them be with their emotions and feel things in their body as they worked with the malleable and scented materials.

Again, these mapped points are unique to each designer and designed project, the dimensions of tools, toys, and technologies are just proposed as to shift the outcome oriented, problem solving obsession of design in order to attend to less physical things like feelings of belonging, freedom to re-frame problems and explore ideas, and ways of relating to other participants. Since the agentic potential is undeterminable in advance, considering intentions through these three lenses of material agency is a way to set intent for the workshop and consider what is being asked of materials. Mapping out personal intentions and examining a workshop from the dimensions proposed above could be a way to enrich practice by shifting beyond a designerly mindsets about how materials were used by people, towards questioning what was enabled and how materials were performing. This suggests attention to issues such as what modes of becoming ethical and relational were being supported, and if the power of the designer is still evident in the outcomes and futures being prototyped. Alternatively, as I have done here, reflecting upon how materials acted in action provides a way to attune to different aspects, reveals how the different materials might have fulfilled different roles that were intended, and can help practitioners better understand their relationship to these material co-facilitators.

7.3 Taking things online

While my research was specifically focused on the material agentic potential in hands-on co-design engagements, the considerations for working with materials can still translate into a digital space. Even without physicality, online and digital ‘things’ are still acting within assemblages of people, internet, computers, tea, desks and beds. Since online workshops are creating a sort of space to be together while separated physically and missing out on non-verbal communication and body language, the attention to the human participant’s experience beyond problem solving is even more important. Working with digital materials as toys for engagement, exploration and collaboration can help combat zoom fatigue and bring moments of connection and delight. Ranging from online whiteboards such as Miro and Murial, to shared formatted Google documents with images and prompts are especially important to consider through the lens of technologies, to pay attention to the ways of working they enable or constrain as well as the what they are making possible in terms of outcome and ideas being shared. Online materials are still ‘things’, and this challenges designers to continue working with the generative capacity of materials, including those off the screen.

In my own practice, this framework was a reminder to save time for play and to set the stage, especially in the context of Covid 19 physical distancing requirements. I included emojis as co-facilitators and used online Miro activities that relied upon visual metaphors to playfully enable exploration (such as in figure 58). This reminded me that the generative power of co-design ‘things’ is not necessarily their aesthetic qualities or preparation from the designers. This framework encouraged me to open up to other ‘things’ such as what participants have around them, or what they would like to gather to think with that is familiar to them.

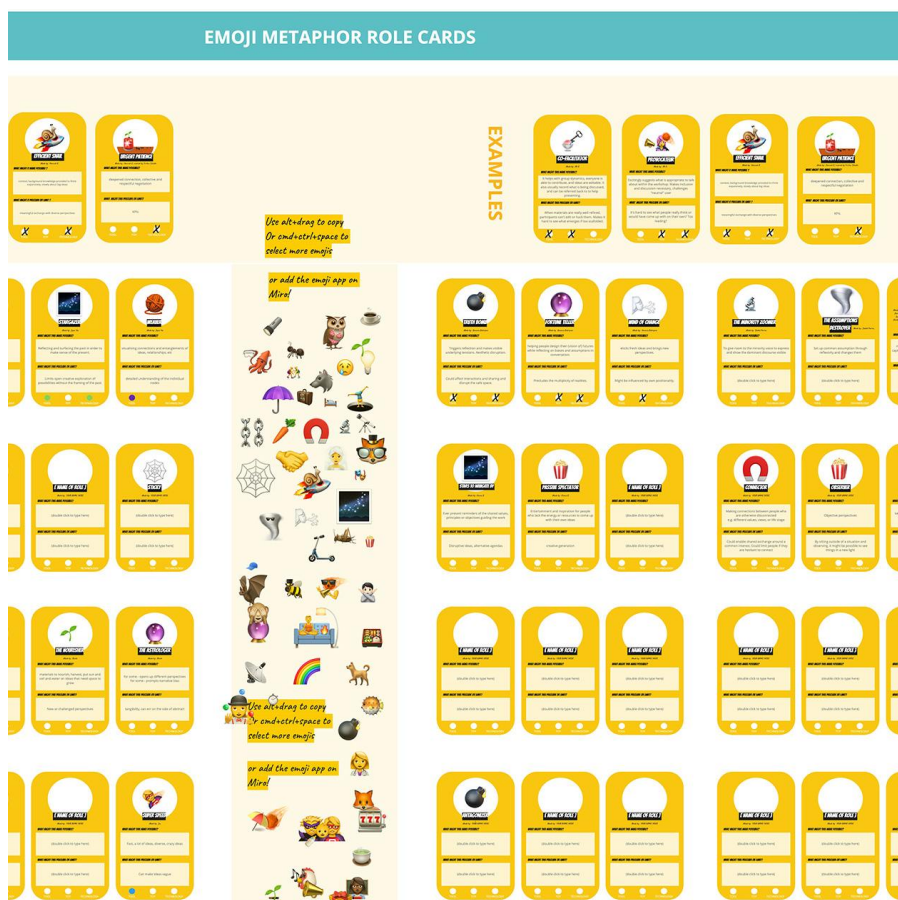


Figure 58. Playful material approaches online

8 Conclusion

The mode of practice-led research enacted over the course of this PhD often stems from “an enthusiasm of practice” (Haseman 2006), yet results in implications for both design practices, as well as research (Haseman 2006; Koskinen & Krogh 2015). Recognising this accountability to both practitioners and academic institutions guided the focus and scope of my research question, which seeks to re-frame the role of co-design materials. The conceptual framework developed through my research was made possible by thinking with the imminent and lively theories offered by new materialism. While I anticipated that an entanglement with new materialism might offer back to Design an expanded interpretation of material agency, I did not expect it to offer so much generative potential in terms of the methodological moves I could make, and to have such transformative implications for my own practice as a co-designer.

In this section, I focus on the distinctive contribution of this PhD research. I will recount the conceptual framework developed through this research, and discuss the main implications this research project has for research methodologies and what it offers to co-design practice. I will then discuss the limitations of my research alongside the potential for future work.

8.1 Offering a Framework

The framework I developed complicates design’s tendency to frame the materials that participate in co-design encounters as ‘tools’ (Sanders & Stappers 2010, 2011, 2014; Sanders & William 2011; Katić, Hmelo-Silver & Weber 2009; Heimdal & Rosenqvist 2012; Bratteteig, Bodker, Dittrich, Mogensen & Simonsen 2013). Through the positioning of these materials as agential things, the framework expands beyond human centred interpretations of these assemblages, and expands attention to the way materials actively participate. As a result, it opens up possibilities for co-design practice that are less outcome oriented and human centred.

To develop this conceptual framework I drew upon new materialist ontology that attends to the materially embedded and embodied (Braidotti, 2011), and especially borrowed from Jane Bennett’s vital materialism (2010), to frame co-design materials as ‘things’ with their own agential capacities in the world. This positioned a workshop as itself as an assemblage of intra-acting social and material elements and affective forces which are entangled and to a degree co-constituting. For example, a city council member becomes a workshop participant in relation to colleagues, a facilitator, the activities, and most importantly for my research – with co-design materials themselves signalling the design engagement. These workshop materials, often paper and other low fidelity materials, have agentic potential which can be catalysed into an ability to co-facilitate, but only in relation to the activity, willingness of an individual to engage, and the participant’s co-constructed identity.

Within this intra-acting assemblage of a co-design workshop, material agency can only be understood alongside other, contextually-specific components. This means that a framework to re-imagine the role of materials beyond their common conception as ‘tools’ needs to be capable of catalysing practice and expanding designers’ considerations rather than falling prey to positivist predictions, smoothing over difference, or static definitions. Therefore, in proposing the three dimensions through which to consider material agency, I put forth the metaphor of constellations, as entry points to making sense of unknown places, the interpretation of which enables new ways of *becoming with* each other and materials in an embodied, entangled, adventure of practice. These dimensions challenge existing understandings of co-design workshop materials, and advance new ways of framing the agency and potential effects of those materials

This framework outlined above emerged from and was tested in action through the practice-led research program, led by the design and facilitation of 12 co-design engagements as well as methodological moves I

made as a researcher. The methodological moves included writing practice narratives with photos and materials from the workshop, an approach that allowed me to interweave reflections from my own experience, insights shared by other people, and understandings inspired by the materials themselves. In this conclusion, I discuss the broader implications of this research, focusing on the specific offerings to research and to practice.

8.2 Implications for research:

Putting the “I” in Methodological Bricolage through Post Qualitative theory

New materialism has, in my research, proven to be more than a lens, and rather an entirely different way of working and approaching research. My methodology changed from something applied to extract data to a “practice of being inside a research event” (Springgay & Truman 2018). In this personally-embodied practice, it became necessary and desirable to see research as enacted in a “view from a body” (Haraway 1991, p. 196), which added ethical accountabilities and sat comfortably with the type of performative research Dwight Conquergood (2002) describes as grounded in active, intimate, hands-on participation and personal connection. As I acknowledged the “I” doing this research, I gradually loosened my grasp on the desire to prove, evidence, and draw universal conclusions from the rich and varied experiences I was analysing. Barad sees these tendencies as a response to the pressures of neoliberalism on universities “with its ruthless individualism and its sole valuing of productivity and profit” (Davies 2018, 115). This enabled a new relationship to methods which was speculative, propositional and capable of illuminating my preconceptions about what should be happening.

Implication for research methodologies

Rather than searching for the right methods to bring together, post qualitative inquiry insisted it was not only alright but necessary to play with visual, material and embodied ways of curating, connecting, collaging and drawing. It encouraged writing with materials, and spoke to Grocott’s (2010) proposition of ‘figuring’ rather than fixing, and of attuning and being affected, rather than trying to impose order. Rather than a series of predefined research techniques, I was asked to be present, to pay attention to what it was I was attuned to and challenged to look beyond how people were using materials, to what materials made possible. These theories called out my tendencies to want to overly determine what my findings could mean for design as a discipline, and in humbling me it also provided the freedom to interrogate and own the way I act as a designer and the way I am in relation to others in the world. In addition to demonstrating the appropriateness of methodological bricolage for practice-led design research, this work also suggests the benefit of conducting this bricolage not from a handbook or collection of methods, but from a willingness to be consumed by theory and to put it back into the world (St. Pierre 2021).

In addition to thinking with theory, the shift in thinking about methods described in this work also benefited from having a safe space for the sort of experimentation and unsettling best thought of as ‘rigorous confusion’ (Following Patti Lather, 1996). The WonderLab ‘playdates’ with other PhD candidates, early career researchers, critical friends and supervisors allowed for modes of presentation, discussion, critique, collaboration and play that are not normally held space for in academia. Rather than presenting findings, we collaboratively interrogated and invented approaches to being in the research and thinking with data. As I suggest the generative compatibility of Post Qualitative approaches to methodology in practice-based research, it is with complete recognition and gratitude that these moves were enabled by the culture of research I was privileged to be part of, and a call for more graduate programs to provide this playful, critical and collaborative way of working.

8.3 Contributions to practice

My research focused on one-off design engagements instead of ongoing partnerships, and was not ultimately responsible for designing finished and tested physical outcomes. It was driven by these workshops with external partners and accountabilities as well as more experimental conference workshops with other creative practitioners. As such, it seeks to offer a set of considerations for designers to reframe our relationship with materials and acknowledge what we ask of our material co-facilitators.

Participant centred co-design approaches

Koskinen and Krogh (2015, p. 122) discuss the challenges of entangling design research, theory and practice, ending with the hopeful claim that “[i]f design research can attract the curiosity and respect of design practitioners, it can alter their profession by encouraging informed, well-articulated, qualified interventions”. Part of the work of creating the tools-toys-technologies framework was holding space to be response-able and calling out the interventionist tendencies of designers. In this spirit, I offer this framework as a catalyst rather than an intervention. In acknowledging the importance of personal positionality in this work, it is also important to remember there is no one design process or way of thinking. As such, I do not propose a framework that says when to use what type of materials such as the one proposed by Sanders, Brandt and Binder (2010) which separates co-design tools from the techniques, and phases of the project. I do, however, offer back to practice a constellation of considerations. These considerations can enable a shift in practice from designing workshops based on reaching an outcome oriented goal, to encouraging a more processual and participant-centred approach that can result in new insights for participants.

Especially illuminated through the dimension of ‘toys’ (Chapter 5), these considerations articulate ways in which designers might attend to participants’ experiences by intentionally facilitating with materials in ways that prioritise moments of play, personal realisations, and relationship-building. Leveraging the different dimensions of what co-design materials were doing allowed me to support the social and emotional aspects of participants’ experience which is not only conducive to creativity (Bratteteig & Wagner 2012), but also revealed how these materials were doing so much more than helping problem-solve as I had initially thought in my early co-design practice. Designing in a way that sought to leverage affective qualities, created sensorial and embodied experiences, and that attended to the social and emotional aspects of the workshop resulted in rich, engaging experiences with potential for transformative learning and sometimes even moments of becoming more ethical through the enactment of minor activisms, as was discussed in Ch 6 ‘Technologies’. My research findings suggest the value of a more participant centred approach,¹² especially in academic contexts, and design engagements concerned with social justice and social innovation.

A slippery slope

Through the creation of the framework, I demonstrated that materials were in fact undervalued in co-design literature, and I had examples from practice to explain exactly how, and in what ways, we might reconsider their agency. However, the examples discussed in this exegesis also come with a warning about the slippery slope of going back to exercising control, pre-determining outcomes, and over-reliance upon these material co-facilitators.

As I thought about my experience of running co-design workshops as well as what certain activities and materials might make possible, I was spending more and more time designing materials and crafting activities specific to the people and context. These elaborately produced spectacles ultimately ended up reverting my practice back to designing *for*, not *with* people. While still co-creating ideas and outcomes, the experience people engaged in was designed and dictated by me, and the materials that I framed as co-facilitators.

¹² What this participant centred approach looks like in action in workshops with City Council members is discussed more in my chapter in the XYX Lab Co-Design methods book, ‘Engaging the Reluctant Feminist’ (Forthcoming).

Misbehaviour (such as not writing ideas down, or starting on the wrong page) was corrected by my facilitation and the addition of printed prompts. People not bothering to sort through all the little laser cut shapes, or not using the optional card deck I had designed for them, was chalked up to lack of time, not a reflection on the usefulness of the materials.

What the framework creation and use enabled

Working through this framework and writing the reflective practice narratives (discussed previously in Methodological Moves 3.4) forced me to reconcile with the way I felt I was being helpful to the point of being controlling. It helped me see the fear of losing respect if I checked in with the groups and transparently changed my plans. It revealed my insecurity in facilitating when I tried to let groups figure out their own process, my concern that they would discuss the wrong thing, or that we wouldn't be able to document it in a cohesive and thorough way. Viewing the materials as co-facilitators and attuning to the three dimensions proposed allowed me to leverage my design expertise, catalyse the creative and experiential workshops, and ultimately craft engaging inspiring experiences that were appreciated and commented on by many participants. However, this framework also required personal work to step away from being an empathetic expert and to be willing to relinquish some control. This vulnerability was supported by my critical friends, supervisors and PhD cohort. It was given form through experimentation of sense-making methods and the development of writing practice narratives. I was fortunate to be amongst a group of people committed to navigating the power structures owning positionality, and exploring relationality in ways that offer back to Design ways of working in socially just and equitable ways. I wish to end with an offering back to the accountabilities of design as a discipline.

Accountability

Earlier in this writing, I described my passionate curiosity about the role of the bespoke materials designers were creating for co-design workshops as the discipline recognises its accountabilities beyond the aesthetic creation of objects. I saw co-design as a way to apply our expertise while not only minimising the harm that can come from not understanding contexts as interventionist tendencies urge designers to come in and 'fix' things, but actually empowering partners and participants through the process (Blomkamp, 2018). I started this project trying to improve this co-design process, using materials to engage, document and encourage equal participation.

Yet even in a research project trying to acknowledge and articulate the affective, relational elements in workshops, especially in the recognition of the intra-active agency of 'things' as discussed in Chapter 3, I found myself considering how they would photograph, how they would be documented, and how they would look. I struggled with the need to create material elements that when assembled, could add meaning and communicate the value and impact of the workshop. Especially for workshops with city councils, I felt pressure to deliver 'professional-looking' and expertly delivered results, despite our claims that this was a messy process that was not about the outcomes but the learning. This behaviour was reinforced in meetings where images of the activities that looked less polished and refined were made smaller or removed from the final reports, while workshops that had results that looked like a google searched image for "co-design" were Instagrammed and made into full-page spreads. The framework I have developed reflects these tensions and intentions, made navigable by shifting from more problem-orientated prompts to more playful provocations, and bringing both into balance by considering what ways of working, being, and socially imagining is being made possible in the workshop, as prompted by the framing of 'technologies.'

My research acknowledges the necessity of diverse and different design practices and seeks to support various contexts within an evolving and growing practice. But what it does not reveal is all the pushback on having playful interludes, concerns whether adults would engage with colourful paper materials, and experiential activities turning into worksheets over concerns about documenting outcomes and getting all the ideas down. All of these concerns (and more) from clients and other designers informed the ultimate delivery

of the workshops that were done with external partners, and all of these concerns and oppositions to more playful relational or emergent ways of facilitating with materials stem from a sense of a problem orientated, neoliberal accountability that has sunk its claws into the way we work and play together in these workshops.

As the time to discuss, space to reflect, and activities for relationship building were sometimes discarded in attempts to fit too much problem solving into a day or half-day workshop, I came to realise that no matter how activated or engaging the materials were, no matter how diverse and lovely the models looked, the design of co-design material and activities can only do so much to foster relationships and create equitable ways of working if these are not already fostered and encouraged by partnering organisations. I re-framed the notion of neutral co-design tools as a way of calling attention to the way we are always already influencing the outcomes, and suggest designers should be more concerned with creating space for discussion and even disagreements, rather than slick workshops that capture every idea that is made visible yet only makes certain perspectives and ideas welcome. Ultimately, designing materials in this way is but one part of a complex assemblage. Fostering relationships with colleagues, critical friends, artists, theorists, activists and writers (alive or dead) who share similar accountabilities can, in different ways help resist concerns, pressures, and expectations to produce, and can remind designers of the importance of affirming, participant centred, emergent and relational process.

8.4 Limitations and Future Directions

Limitations

The main constraint and limiting factor on this research into collaborative and hands-on encounters was of course the Covid 19 pandemic and accompanying social distancing and lockdowns. It abruptly halted several workshops that had been developed to directly support my research. It also necessitated a change from planning to create frameworks in a collaborative and workshopped way, to something that could be done without other people in a locked down apartment in Melbourne, which now has the dubious honour of being the world's most locked down city. This did, however, result in several online workshops that helped me consider how the framework translates to digital, virtual spaces. It also threw into sharp relief the difference between a verbal zoom meeting discussing and writing down ideas compared to the materially facilitated workshops that were the objects of my study. Additionally, the creative constraints lead to the development of techniques for writing practice narratives that could be done with images on my computer instead of in person and provided more time to immerse myself in new materialist theory than otherwise would have been possible.

It was my desire to take steps away from the instrumentalisation of materials and towards a way of working that acknowledged the active role of materials, and that learned from the ways materials helped us work in ways we otherwise could not. However, in writing with the theories from New Materialism which centred on material agency, I found myself describing what was happening in terms of the actions of people, or the results of people's action and statements shared with me. While methods in New Materialism are evolving (Fox and Alldred 2015) and can not be determined in advance (St Pierre 2021), having more established methods to draw upon that do challenge the human centred nature of qualitative methods would have been productive to this research.

Future Directions

More interesting and indicative of future directions are the intentional boundaries and agential cuts (Barad 2007) that were made to determine the scope of my research, especially relating to acts of facilitation and ways of knowing. Decisions to focus on material agency through framing my inquiry as 'the role of materials' productively challenged expectations around who and what participates and how. This framing revealed dimensions of material agency previously unacknowledged. However, the resulting framing – particularly of 'toys' – asks more of a design/facilitator than the current description of techniques acknowledges, which is predominant in Co-Design literature (Sanders and Stappers 2009; 2010). This suggests further research into the ways in which designers might be able to respond and

improvise according to participants' needs, and reinforces the importance of Akama's (2012) call to pay attention to the embodied performance of facilitation. This points towards further development of what safe spaces in design look like psychologically and socially as well as materially, and facilitations role in that –something discussed more in fields like community organising but less so in design. It also opens up the potentials for explorations in rearranging relationships between materials facilitators and participants, such as a co-designed co-design workshop in which activities are negotiated and co-created; or entirely materially mediated ones in which improvisation and play are ways forward in the absence of scaffolded activities.

Ontologically, by selecting new materialism as a lens through which to reimagine the roles of co-design materials, I made a sort of agential cut, leaving out movements like Anne Marie Willis's *Ontological Designing* (2006), ontologies informed by the global south such as Aurtoro Escobar's *Pluriversal Design* (2017), as well as Indigenous ways of knowing. I also avoided incorporating Indigenous ways of knowing since I initially thought that the application of those theories without a rigorous focus on them and experience of the ways of living they related to would be inauthentic and even tokenistic, and not the careful and culturally safe practice called for by the Indigenous Design Charter (indigenousdesigncharter.com). This does however, open up future directions for partnerships with people more qualified to speak to these ontologies, and bringing together new materialist theories with indigenous ways of knowing in particulate would address concerns by those who caution that new materialism is overly westernised and ignores rich histories of knowing and being that precede it, and would further contribute towards sustainable and equitable design practises.

9 Some Last Words

This image that sticks with me the most from this body of work isn't the felt planets and rockets I spent days designing. It isn't the colourful paper people, or the shapes that took so many tries to get to fold together just right. It isn't even people smiling over materials I made for them or the learnings and collaboration these engagements enabled. It didn't even happen during this research, but is happening now as you read this.



I like the thought of worms and fungi completing the cycle, nourishing the soil that supported the trees. The minerals from the playdough being distributed and consumed, becoming something else. Similarly, I like the thought of the future designer/facilitator/researchers who might find these words, who might adopt parts of this framework, breaking it down, letting it nurture their work, and growing something entirely different.

Considering this body of research centred around custom made, bespoke co-design materials, I am surprised to realise that lately, my workshops have been more down to earth, literally and metaphorically. I find myself paring back and going outside whenever possible – not only to be covid safe but to practice modes of attention to what is already all

around us and doesn't need to be produced. When I do produce materials, I've been planning for re-use and recyclability, and encouraging careful disassembly and putting away as part of the closing ritual. Instead of hoping what I have prepared will work, I find myself laughing in delight as participants share what they have brought to work with, or scavenging for materials together, discussing openly what the material co-facilitators we bring might enable us to think/do/make.

While I set out to improve my practice of designing bespoke materials, this new materialist inquiry instead turned my attention to what is already here, and relational and active. Having gained more awareness of the assemblages these co-design things act within, I find I ask less of my material co-facilitators, yet value them even more as I work and play with participants, discovering what we make possible together.

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