

Visualizing Support Through Speculative Digital Spaces

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ABSTRACT

Rape culture permeates all facets of society. It is a culture wherein sexual violence, especially sexual violence against women, is treated as a normal and acceptable part of our daily lives. While we know that rape culture impacts many people, over the past few years we have seen and heard first hand accounts of the impact of rape culture in an unprecedented way. Social media has become an important space for those impacted by rape culture to share stories of sexual violence and harassment with viral hashtags from #YesAllWomen to #MeToo. While these stories have provided insight into the ways in which rape culture permeates society, wholistic spaces of support have not manifested themselves in online spaces in the same way. Through my work I will demonstrate how the visualization of affective, qualitative data can be used to consider what wholistic spaces of support can look like in a digital context.

I will discuss the development of my research-creation project *What Do You Need?* as an example of how non-traditional data visualization can be used to explore the diversity of ways that people imagine supportive and empowering environments. *What Do You Need?* is a visualization of imaginative spaces of support that uses participant submitted visual data to make computer generated collages. Through participatory design methods and a combination of collage and computation I explore how multidisciplinary approaches to qualitative data visualization can be used to gain insight into complex issues.

Keywords: participatory design, cultural probe kits, rape culture, speculative data visualization

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Introduction

Millions of people have used viral hashtags to share their experiences with sexual violence and harassment on the streets, in their workplace, and in their private lives (Khomami, 2017). As such, collectively bearing witness to the impact of rape culture via social media has become increasingly common in recent years.

In May 2014, a man who declared his hatred for all women went on a shooting spree in Isla Vista near the University of California. In response to this tragic act, women took to Twitter using the hashtag #YesAllWomen to share their experiences with sexual violence and harassment. Tweets such as,

#YesAllWomen because 'I have a boyfriend' is more effective than 'I'm not interested' – men respect other men more than my right to say no

were a response to the fact that, while the perpetrator's actions were on the far end of a spectrum of violence, the views that he espoused were part of a larger culture of misogyny that impact women on a daily basis (Weiss, 2014).

In October 2017, following numerous allegations of sexual misconduct against prominent film producer Harvey Weinstein, people took to social media once again. This time they rallied around #MeToo. Adopted from a campaign started by organizer Tarana Burke in 2007, actress Alyssa Milano encouraged those who had experienced sexual violence and harassment to use the hashtag to demonstrate the magnitude of the problem of sexual violence (Mazza, 2017). The hashtag garnered tens of thousands of responses in a matter of hours with some people sharing simply the two words, and others providing in-depth accounts of their experiences with sexual violence and harassment.

Those who have chosen to share their experiences online have contributed to raising awareness about the pervasiveness of sexual violence and harassment. However, a further investigation of the subject requires more than 280 characters. The individual experiences shared by people online are concrete examples of a larger cultural issue wherein sexual violence, especially sexual violence against women, is treated as a normal and acceptable part of our social lives. Since the 1970s, this cultural phenomenon has been described as rape culture. In a rape culture, sexual violence is normalized through the trivialization of male sexual

violence. As Emilie Buchwald, Pamela R. Fletcher, and Martha Roth describe in their anthology *Transforming a Rape Culture*, "...in a rape culture, women perceive a continuum of threatened violence that ranges from sexual remarks to sexual touching to rape itself. A rape culture condones physical and emotional terrorism against women and presents it as the norm," (2005, p. xi). The experiences that people have shared using social media represent the continuum of violence described by Buchwald et al. It is important to frame these experiences within the context of rape culture because it emphasizes that the ideology that upholds actions of sexual violence and harassment is deeply embedded in our society.

When large numbers of people's personal experiences with sexual violence and harassment are taken together, they provide significant insight into the everyday impacts of rape culture. My research began with an exploration into how design can be used to visualize affective, qualitative information, such as the types of experiences with sexualized violence shared on social media. This question was situated within an investigation into how design can be used to shift the discourse about complex topics. As rape culture is perpetuated by a complex set of beliefs that are deeply embedded in society, the tangible insights provided by the sharing of personal experiences produce a greater understanding of rape culture and its effects.

#YesAllWomen and #MeToo are only two instances of hashtags that provide insight into what rape culture looks like. Millions of people have also shared their experiences with rape culture, and have shown solidarity with those who have experienced sexual violence and harassment with hashtags including #BeenRapedNeverReported, #IBelieveSurvivors, and #NotOkay.

Both #BeenRapedNeverReported and #IBelieveSurvivors were used in response to allegations of sexual violence against Jian Ghomeshi, a popular CBC radio host. In October 2014, following public commentary that questioned the validity of the accounts of assault shared by Ghomeshi's accusers, *Toronto Star* reporter Antonia Zerbistas, followed by *Montreal Gazette Reporter Sue Montgomery*, took to social media to share their personal stories of rape that they chose not to report using #BeenRapedNeverReported (Keller et al., 2018). The hashtag gained global traction with millions sharing their own experiences. In March 2016, as a response to the verdict of the Ghomeshi trial, which resulted in an acquittal as many had predicted, people once again took to social media with #IBelieveSurvivors. The statement was used as a demonstration of solidarity with those who have experienced sexual violence. Contextualized within the Ghomeshi verdict, the hashtag was also a display of protest against a criminal justice system

that rarely convicts perpetrators of sexual violence, and against a culture wherein accounts of sexual violence are rarely believed.

#NotOkay gained traction in October 2016 during the Presidential election in the United States. When 2005 audio footage of Presidential Candidate Donald Trump was released in which he bragged to former Access Hollywood reporter Billy Bush about sexually assaulting women, people took to social media to share their dismay with Donald Trump's actions (Jenkins and Mazer, 2016). Moreover, while some commentators dismissed the conversation between Trump and Bush as "locker room talk," the #NotOkay hashtag was a rebuke of how the "locker room talk" discourse perpetuated the normalization of sexual violence.

The hashtags described thus far demonstrate the important role that social media has played in the emerging discourse surrounding the impact of rape culture. As popularity has risen in the use of social media for sharing these personal experiences, scholars have begun to investigate why. Through studies about how people engage in conversations about rape culture online, researchers have investigated why people use social media forums and have found that it offers a sense of community and solidarity (Keller et al., 2018). For people who have experienced sexual violence and harassment, sharing personal experiences in social media forums also provides an opportunity for reclamation. In a 2016 article titled *Exploring rape culture in social media forums*, Zaleski et al. recount the findings of a study into, "...the digital discourse of rape culture within comment threads that followed a sexual assault news story," (p. 2). Through naturalistic observation of comments, Zaleski et al. found that, "... when survivors feel marginalized by the process of reporting they turn to social media to regain their voices," (p. 5). The ability to regain one's voice is demonstrated by every example described thus far, from "#YesAllWomen because apparently the clothes I wear is a more valid form of consent than the words I say," (Weiss, 2014), to "I was 16 and walking in Rome and a grown man went out of his way to try to grab my crotch #NotOkay," (@carabear133, 2016). While each hashtag has spoken to a different cultural moment, they share the characteristics of social media as a forum for the reclamation of personal experiences, finding community, and building solidarity.

I began my investigation into visualizing affective, qualitative data with two projects: *lockerRoomTalk* and *That Feel When....* Both projects were situated within the understanding of digital forums as spaces for community and solidarity among those who have been affected by sexual violence and harassment. Using text-based, qualitative data I investigated how to

visualize affective experiences in the context of social media as a digital space for fostering community. In both cases I discovered that bringing singular experiences together in digital space helped to visualize a network that provided information and insight into the broader social structures that uphold rape culture.

While social media offers a space for those who have experienced sexual violence to be heard, I was interested in doing more with this information. Opportunities for people who have experienced sexual violence and harassment to reclaim their personal experiences, find community, and build solidarity are important building blocks for shifting the discourse on rape culture. As social media has provided space for these discussions, there is room to investigate whether digital forums can be used within other aspects of the fight against rape culture. One important part of this fight is providing support for people who have experienced sexual violence and harassment. It is clear that sharing personal stories is an important part of demonstrating rape culture. While disclosure can mean reclamation of one's own experience, it can also be triggering. Therefore, it is important to ensure that those who have disclosed their experiences have access to support and care. I saw potential in using design to create spaces of dialogue to investigate whether digital forums can be used within other aspects of the fight against rape culture. Building on concepts such as adversarial design, the use of design to engage viewers in dialogue and debate (DiSalvo, 2012), and speculative design, through which designers speculate how things could be (Dunne and Raby, 2013), I could explore how design can be used to shift the discourse on rape culture and consider how support is conceptualized within digital spaces.

To approach my work I developed my research question based on an interest in considering how to move beyond displaying the prevalence of rape culture. Moving forward with my investigation into how to visualize the experiences of sexual violence and harassment shared in social media forums, I was more interested in gathering and visualizing information about how people who are working to combat rape culture envision support. While the sharing of people's experiences with rape culture are an integral part of combating sexual violence and harassment, investigating how people imagine support provided an opportunity to encourage a reimagining of discussions about how to combat rape culture. As the everyday impacts and instances of rape culture become increasingly clear, a focus on digital spaces of support provided rich ground to uncover new ideas not only about what rape culture is, but how it can be combated. Specifically, I was interested in how to collect and visualize affective, qualitative data about the

diverse ways that people imagine supportive environments. This question informed the development of a participatory design activity and accompanying design project, which worked to digitally represent environments that people who have been affected by sexual violence and harassment find supportive.

In the Research Methodology chapter, I will explain how I made use of a participatory design approach to explore my research question. Participatory design is a process wherein participants contribute directly to the design process (Kuhn and Winograd, 1996). Using a participatory design approach was important to me because, although I have an understanding of rape culture and how it operates, I am not an expert on other people's experiences. Participatory design methods provided an opportunity for others to actively engage in the project making it more reflective of the diversity of people's lived experiences. Specifically, I used cultural probe kits as a participatory design method. Cultural probe kits are designed packages used by participants to share information about their everyday lives, thoughts and interactions (Gaver et al., 1999). The goal of the cultural probe kits, as introduced to the participants, was to investigate the creation of imaginative, digital spaces that encompassed the diverse needs that need to be met in the ongoing work to combat rape culture. The data collected from the cultural probe kits was interpreted and informed the creation of a project that aimed to visualize the understanding that creating supportive environments that work to combat rape culture must be done in a way that considers the diversity of people's lived experiences.

The resulting project titled, *What Do You Need?* is a visualization of imaginative spaces of support. Situated in the era of social media ubiquity, *What Do You Need?* brings the conversation of supportive spaces beyond viral hashtags, to carve out a digital space for people to support one another in the face of sexualized violence. The project explores the diversity of ways that people imagine supportive and empowering environments by visualizing the data gathered from the cultural probe kits. The project compiles the visual data from the cultural probe kits into generative collages that continuously create new images that reimagine how we foster supportive environments in a digital context.

The millions of people who have used viral hashtags to share their experiences with sexual violence and harassment have contributed to providing tangible insights into the everyday impacts of rape culture. Through the development of cultural probe kits and the creation of the visualization *What Do You Need?* I explored how to gain new insights into what people need to

combat rape culture, and how those needs can be visualized. In the Theoretical Framework chapter I will situate this project within existing literature drawing from design theory, data visualization, and intersectional feminist theory. In the Research Methodology chapter I will provide further insight into my use of participatory design as a qualitative research method, and the unique insights that can be gathered from cultural probe kits. Finally, in the Design Research and Process and Reflections chapters I will provide an in depth description of *What Do You Need?* along with the takeaways from the project about how data visualization can be reconsidered in relation to the collection and visualization of affective, qualitative data. The ongoing work to combat rape culture requires a multifaceted approach that both raises awareness about rape culture and reimagines a world without it. Through participatory design methods and an investigation into how qualitative data can be visualized this research recognizes the importance of raising awareness while moving towards envisioning a world without rape culture.

Theoretical Framework

I undertook my exploration into how to gather and visualize affective, qualitative data within an interdisciplinary framework. As this research used design methods to consider subject matter that is often discussed in other disciplines, an interdisciplinary approach enabled a wholistic understanding of the potential impacts of this research. Drawing from disciplines spanning computer science to sociology I was able to consider the outcomes of this project not only within design theory, but within other disciplines where alternative approaches to data visualization and combating rape culture are being explored. In the field of design theory, scholars such as Carl DiSalvo, Anthony Dunne and Fiona Raby consider how design can be used to incite and encourage debate. My research is situated within this consideration of the role of design in enabling discussion, while looking specifically at the practice of data visualization, and how it can evolve to consider affective, qualitative data. To further consider the collection and visualization of less traditional forms of data, I turned to intersectional feminist theories. These concepts informed a community-focused approach to data collection attuned to the historical context of rape culture and the communities that are traditionally most affected by gender-based violence.

Adversarial & Speculative Design

In *Adversarial Design* (2012), Carl DiSalvo defines adversarial design as the design or use of artifacts or objects to engage with political issues. He uses political theory to discuss design concepts and explores these concepts in contemporary art and design practice. Specifically, DiSalvo references the political concept of agonism, which argues that democracy is intrinsically contentious and therefore spaces of contestation must exist for democracy to flourish. He argues that in design practice the concept of agonism can be applied towards the creation of spaces where plurality is encouraged to foster critical conversations. Broadly, my research is situated within adversarial design and the use of design to engage with political issues. I was interested in creating a space for dialogue around a complex topic that might otherwise be difficult to engage with.

This research also builds on DiSalvo's investigation into information design, and the power of information design to reveal hegemony. He discusses how discovering and revealing connections between power structures through design can lead to greater, and more informed conversations about issues of power and dominance in society. A specific example of this is a project titled *Million Dollar Blocks Project* (2006) by the Spatial Information Lab. This data visualization project contrasts incarceration rates with social spending in four American cities. The project creates a space for contestation that challenges people's understanding of urban environments and the conditions and structures that are normalized and upheld within such environments. Through the graphic organization of complex information in *Million Dollar Blocks Project*, the Spatial Information Lab created a narrative that encouraged viewers to think differently about an issue. Through my research I worked to build on such examples of creating narrative through the visualization of complex data with a focus on working with qualitative, affective information.

Similar to adversarial design in its encouragement of political discourse through design is speculative design. Examined by Anthony Dunne and Fiona Raby in their book *Speculative Everything* (2013), speculative design encourages the creation of work that incites debate about alternative ways of being. Through defining speculative design as the use of design, "as a means of speculating how things could be," (Dunne and Raby, p. 2), they argue that by exploring alternative scenarios we can encourage more desirable futures and make reality more malleable. The speculative projects that Dunne and Raby cite aim to encourage the free flow of

imagination towards inspiring alternative futures. While Dunne and Raby know that the future cannot be predicted, they contend that engaging in more imaginative practices such as speculative design can help consider our reality differently, and encourage new ways of thinking.

Dunne and Raby exemplify their definition of speculative design as means of exploring alternative scenarios in their project *Do You Want to Replace the Existing Normal?* (2008). The project is comprised of a series of four objects such as *The Risk Watch*, an unconventional watch with a rubber nipple instead of a watch face. When the watch is placed next to the user's ear, a device is triggered that reads a number relating to the political stability of the country the user is currently in. *The Risk Watch*, along with the other objects in the *Do You Want to Replace the Existing Normal?* project series aims to imagine a time when people's needs are more complex and subtle than they are today. Following the ethos of speculative design, the project description notes that we cannot have imaginative design if our desires are unimaginative and practical. While they note that the objects in this series might be utopian, they have been designed in anticipation of an alternative future.

Actionable Insight: Taken together adversarial and speculative design provided a framework for considering how design can be used to encourage discussion and debate. Adversarial design encourages the creation of spaces for debate, usually through the design of functional objects. While speculative design more specifically encourages the creation of spaces that foster imaginative debate, through objects that can be either functional or non-functional props. Both concepts provide a unique way to consider how rape culture can be discussed through design. The social systems that sustain rape culture are deeply ingrained in society. As such, an adversarial design lens with a focus on creating agonistic spaces of discussion and debate encourages the representation of a plurality of viewpoints and a speculative design lens encourages imaginative solutions for a society where rape culture is not deeply ingrained in social systems.

Traditional Data Visualization

Within the context of using design to create space for political discourse, I used data visualization as an approach for conveying experiences and evoking these spaces. Data visualization has long been used as a tool for social and scientific discoveries. From Dr. John

Snow's dot map of cholera deaths in 1855 London, which revealed the hidden connections between deaths and a contaminated well (Chen, 2010), to the *Million Dollar Block Project* described above, visualizing quantitative data enables the uncovering of hidden structures. However, numbers do not always tell the whole story, and not all data comes in this form. As with the experiences of sexual violence and harassment shared by people in massive numbers online, qualitative information provides equally important insights into structures that are not always immediately obvious. With the understanding that quantitative data visualization has a long history of helping to uncover or better understand information, I was interested in thinking through the practice of data visualization using qualitative, affective data to visualize the equally important insights of qualitative information.

Actionable Insight: To consider data visualization as a design tool for encouraging discussion and debate, it is important to define it within art and design practice. In *Beautiful Visualization* (2010), an anthology about interdisciplinary data visualization practices, editors Julie Steele and Noah Iliinsky introduce data visualization as, “the practice of presenting information for consumption as art,” (p. xi). Specifically, they define beautiful data visualizations as offering viewers new understandings and insight at a glance. For example, in *Mapping Information: Redesigning the New York City Subway Map*, Eddie Jabbour recounts his process for redesigning the New York Subway map using a minimalist graphic design approach that provides users with a clearer picture of the subway system that can be processed easily (p. 82). While traditional data visualization's such as Jabbour's New York Subway map provide a starting point for visualizations that offer a new level of understanding about topics at a quick glance for viewers, I was interested in how I could build on these methods to investigate and elicit more emotional responses.

Visualizing Emotional Information

While data visualization can provide new understandings about a range of topics, I was particularly interested in exploring how data visualization could be used to gain a greater emotional understanding of issues. Author Rita Raley provides some insight into this in her book *Tactical Media* (2009). Through the analysis of a number of projects that explore military involvement around the world, Raley describes how visualizing information can be used in projects about war to produce emotional responses that would otherwise be numbed by the usual string of statistics. One project analyzed by Raley is *The Great Game* (2001) (*Figure 1*) by John Klima. The project, which used 3-D maps generated by the Department of Defence,

visualized the movement of military weapons and equipment as well as the transfer of territorial control between the Taliban and the UN each day from October 7 to November 25, 2001. While the project has the affordances of a game, the “player” is unable to alter the course of action. However, the viewer as audience is implicated through interactions such as the movement of icons around the board. Ultimately, the project aimed to foster a space for the viewer to consider their relationship to this world event without thematizing mourning (p. 91).



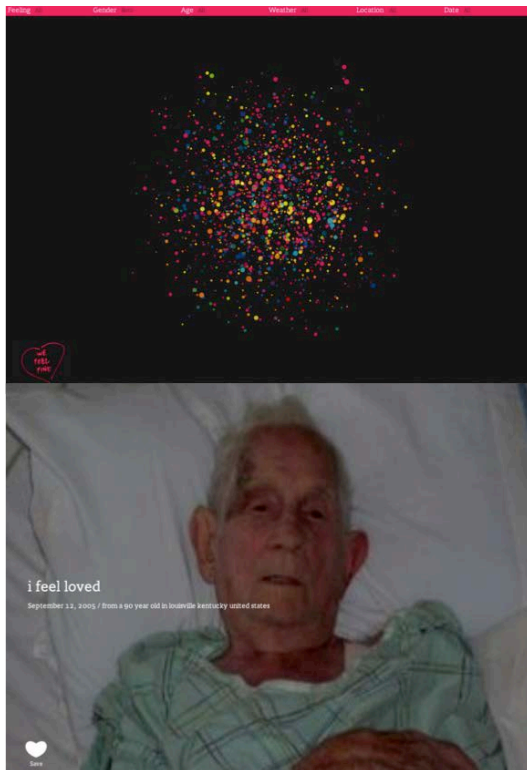
(Figure 1. The Great Game Screenshot. From “The Great Game,” by John Klima, 2001, [http://www.cityarts.com/greatgame/.](http://www.cityarts.com/greatgame/))

Actionable Insight: Raley’s analysis of information visualization and persuasive gaming through war simulations provides an opportunity to think about the visualization of issues that might otherwise be difficult to engage with. In the context of this research, the complexity of people’s experiences with rape culture can make the topic as difficult to engage with as it is for people to engage with the painful subject of war. Through Raley’s analysis of *The Great Game*, I was able to look at data visualization through the lens of emotional response. Specifically, I was interested in how the building of creative environments, such as in Klima’s project, could elicit a more emotional engagement with information than in forms of traditional visualization such as graphs. Building on this analysis I could consider how to, not only elicit an emotional response, but also visualize data that is itself emotional.

Experiential Data Visualization

As is clear in Raley’s analysis of projects that take a more complex approach to data visualization, there is an expanding vocabulary to describe this work. There is an emergence of projects that take a qualitative approach to data visualization resulting in more terms to define

the visualization of affective experiences. One way such work has been described is as, *experiential data visualizations*. Coined by Sep Kamvar and Jonathan Harris to describe their project, *We Feel Fine* (2006) (Figure 2) - an online visualization that gives form to human emotions by organizing information about feelings shared online as colour coded dots. Kamvar and Harris describe experiential data visualizations as having three components: communicating insights that are often simply communicated with words, but can be more powerfully communicated by example, focusing on interaction models that encourage direct interaction with individual data items, and focusing on influencing affect rather than cognition (Kamvar and Harris, 2006).



(Figure 2. We Feel Fine Project Images. From “We Feel Fine,” by Sep Kamvar and Jonathan Harris, 2011, <http://www.wefeelfine.org/movements.html>.)

Actionable Insight: The three components outlined by Kamvar and Harris provided a way for me to begin thinking about how non-traditional data might be visualized. As the focus of my research was visualizing supportive environments, it was powerful to consider how I could communicate the insights provided by participants by example rather than words. Additionally, as this project worked to investigate a diversity of viewpoints, I considered how to foster a more imaginative space that worked to influence affect rather than cognition.

Casual Information Visualization

The paper *Visualising Things: Perspectives on how to make things public through design*, investigates the term visualization more generally (Schoffelen et al., 2015). Broadening the concept of visualization beyond visualizing data or information, they "...incorporate any perceivable representation of issues that have direct evidence in the form of abstract data. i.e. data that does not possess physical or perceivable shapes or forms," (p. 180). For example, perspectives shared through participatory design methods such as visual maps made in collaborative mapping methods, or perspectives shared through photo or video. In their broadened approach to the concept of visualization, they consider both the gathering and the visual organization of information. They consider visualization within the lens of participatory design focusing their investigation on visualizations that enable stakeholders to gather around an issue through creative means. As part of their investigation into broader visualization methods Schoffelen et al., study projects that aim to make things public through visualization. Specifically, they discuss a project titled *The Neighbourhood, Our Garden* (2013) (Figure 3) by Barbara Roosen et al. The project aimed to create a space for discussion about societal and ecological challenges related to the desirability of detached single-family housing in green surroundings. While a large screen displayed questions, participants were invited to share their responses to the questions via a sketchbook.



(Figure 3. Installation Images. From "The Neighbourhood Our Garden", by Barbara Roosen et al., 2013. Adapted from "Visualising things. Perspectives on how to make things public through visualization," by Jessica Schoffelen et al., 2015, October 12, CoDesign, p. 187)

Actionable Insight: *The Neighbourhood, Our Garden* provides insight into the importance of engaging people in information visualization. The use of both digital and analog technology,

through the display of questions on a screen and the call for responses via a sketchbook, fostered an environment that encouraged ongoing debate and dialogue.

Investigating how the concept of visualization can be broadened allows for greater insight into how to visualize non-traditional information such as affective, qualitative data. One of the concepts used by Shoffelen et al., to investigate *The Neighbourhood, Our Garden*, is *casual information visualization*, coined by Zachary Pousman, John T. Stasko and Michael Mateas, to describe projects that visually depict personally meaningful information to everyday users (Pousman et al., 2007). Casual information visualization projects cover a broader range of projects outside traditional data visualization. They include a wider spectrum of users, not requiring the user to be an expert in understanding visualizations. They also encourage user engagement over a longer period of time, whether it is over weeks and months or as a long moment of contemplation in a gallery setting. As mentioned, they also typically represent more personally important information, and thus provide insight that is different from more traditional data visualization. Overall, casual information visualization projects are visual depictions that, more than being aesthetically pleasing, aim to provoke unique insights into subject matter through visual representation.

Speculative Visualization

Bridging this broadened concept of data visualization and design theory, Tanyoung Kim and Carl DiSalvo introduce the term *speculative visualization*. Considering umbrella terms for non-traditional visualizations, such as casual information visualization, paired with the concept of speculative design, speculative visualizations combine, “the challenging perspectives of artists, the aesthetic representation of designers, the analytic ability of scientists to interpret data, and the love for humanity of philanthropists,” (Kim and DiSalvo, 2010, p. 2). Influenced in part by casual information visualization, DiSalvo and Kim describe speculative visualization as a sub-category of speculative design. Speculative visualizations use visual representation methods to create thought-provoking work by combining multi-disciplinary practices. Through the combination of graphic design and data visualization methods speculative visualizations differ from traditional visualization by using artistic approaches to visualize scientific data.

Photographer Chris Jordan’s project *Plastic Cups* (2008) (*Figure 4*) is named by DiSalvo and Kim as an example of speculative visualization. *Plastic Cups* is a depiction of one million plastic cups, the equivalent number of cups used every six hours on United States airlines flights. On

first viewing, the image is abstract and looks like an image of pipelines, but when viewed more closely, one can notice that the image is comprised of stacks of disposable cups. There is an overwhelming impact for the viewer to see how quickly these small disposable objects pile up. *Plastic Cups* is part of a larger series titled *Running the Numbers: An American Self-Portrait*, where Jordan aims to raise questions about the role of individuals in a collective. With the goal of eliciting a different response than that which is elicited through numbers alone, he uses images to represent quantities such as fifteen million sheets of office paper, the amount used over just five minutes in the U.S., or 106,000 aluminum cans, the number used in the U.S. every thirty seconds.



(Figure 4. Plastic Cups Screenshot, Left – Full Image, Right – Detail. From “Plastic Cups,” by Chris Jordan, 2008, <http://www.chrisjordan.com/gallery/rtn/#plastic-cups>)

DiSalvo and Kim note that the pairing of data with communication design can foster discussion about public concerns with the potential for changing perspectives, attitudes or behaviours. They argue that data becomes more accessible, intelligible, and interesting through visualization and that speculative visualization, as it brings together graphic design and data visualization, has the potential for conveying more meaningful and influential insights about data.

Actionable Insight: While I situated this research in a speculative design lens to encourage imaginative solutions for a society where rape culture is not deeply ingrained in social systems, the concept of speculative visualization provided a reference point for practices of visualizing these ideas.

Other Means of Visualization

The concepts of casual information visualization and speculative visualization provide a lens for investigating additional projects that use artistic or designerly means to visualize information in a

thought-provoking way. For example, *The Space We Hold* (2017) (Figure 5), a co-production between the National Film Board and digital production company Cult Leader, is an interactive web project that merges documentary film, interaction design and data visualization. The project provokes audiences to bear witness to the testimonies of three former “comfort women” - women who were forced into sexual slavery during World War II by the Imperial Japanese Army. As videos clips of the women recounting their stories play, users are asked to make their presence known through keyboard prompts. This opportunity for active engagement with the women’s testimonies aims to guide users from the act of witnessing alone to engaging in a collective response to these stories. In addition to making their presence known through keyboard prompts, when all of the video clips have played, users are invited to provide a written response to the women’s testimonies. These responses are displayed in a particle-like visualization on the final screen of the project where users can click on individual particles to explore other user’s responses to the testimonies. Linking the issues of rape as a weapon of war, and in the context of considering the prevalence of sexual shaming and harassment online, *The Space We Hold* engages in a reimagining of how stories of sexual violence are heard and responded to. Specifically, the project uses visualization to encourage users to move from individual witnessing to collective engagement while considering what the digital age means for bearing witness to testimonies of sexual violence.

Actionable Insight: While I was particularly interested in engaging participants in the data that a visualization could be comprised of, I drew inspiration from how this work used visualization to foster conversation, even for those who did not contribute. Specifically I was interested in building on the notion of reimagining how we witness stories of sexual violence by thinking about the construction of the spaces where these stories are witnessed.



(Figure 5. The Space We Hold Screenshots. From “The Space We Hold” by National Film Board and Cult Leader, 2017, <https://artscience.ca/work/the-space-we-hold/>)

While considering the form of the project, I was particularly interested in investigating work that digitally visualized non-traditional forms of data, namely images. As my research focus considered the gathering of information that might be difficult for people to convey through words, it was important to investigate projects that have worked with data in this way. The digital installation *Noplace* (2007-2008) (Figure 6), a collaboration between Martin Wattenberg, Marek Walczak, Jonathan Feinberg, Rory Soloman and Johanna Kindvall, provided some insight into how I could consider the visualization of digital spaces created from data. *Noplace* generates shared and personal utopias by gathering images, sound and text from online feeds. The project existed as both a physical and online art installation. The physical installation was a depiction of multiple utopian visions while the online version invited users to create their own personalized *Noplace* world.

Actionable Insight: The use of layered imagery, sound and text to create digital space gave me insight into how I could consider the visualization of data that was neither quantitative nor text-based. While a major consideration of my research is the depiction of how different people imagine supportive environments *Noplace* provided a reference point for how this could be explored.



(Figure 6. Installation Image of Noplace. From “Noplace” by Martin Wattenberg et al., 2007 2008, <http://www.bewitched.com/noplace.html>)

In addition to drawing from casual information visualization and data visualization, which are used to define digital projects, I was also interested in the visual forms used by activist movements who are working to combat rape culture. One such example is *The Monument Quilt* (2013) (Figure 7), created by FORCE: Upsetting Rape Culture. Drawing inspiration from the

AIDS Memorial Quilt, *The Monument Quilt* is a public art piece comprised of red quilt squares with stories from survivors of sexual violence and assault stitched into them. The participatory project uses quilting as a tool for people to share their experiences with rape culture. As the project states that through stitching stories together it aims to create and demand public space to heal, *The Monument Quilt* provides insight into analog methods for fostering and visualizing people's experiences.

Actionable Insight: As part of my research was concerned with how I could collect affective, qualitative data, I was particularly interested in the type of engagement participants would experience with a project like *The Monument Quilt*. Rather than sharing one's experience digitally, *The Monument Quilt* had a tactile component. As my research investigates how to provide digital spaces of support while carving out spaces for affective experiences to be shared, this project provided a reference point for exploring how to gather experiences through analog methods.



(Figure 7. Monument Quilt in stages, From "Monument Quilt" by FORCE: Upsetting Rape Culture, 2013, <https://themonumentquilt.org/view-the-quilt/>)

As is clear in *The Monument Quilt*, the collection and visualization of a diversity of experiences is an important aspect of the visual culture of combating rape culture. This is not surprising, as social media has been used in a similar way to be a digital space for the collection and visualization of a diversity of experiences. While engaging in this research, I considered the importance of visualizing diverse experiences, as seen in both *The Monument Quilt* and people's social media behaviour, alongside the broader cultural contexts that the subject matter of combating rape culture exist within. Further, considering the discourse surrounding rape culture was particularly important as casual information visualization and speculative visualization aim to engage audiences in considering new insights. As such, it is important to, not only consider the form that such projects take, but to also situate the subject matter within

the current discourse. Recognizing that rape culture is a concept coined by feminist theorists it is important to situate this research within a feminist lens. More specifically, it was important to me to frame this research within an intersectional feminist lens when both shaping the participant's activities and throughout the visualization process. With insight from texts that provided a deeper historical analysis of rape culture, and through a further investigation of feminist art practice I worked to situate my research within current discourses of combating rape culture.

Discursive Context

Long before the ubiquitous nature of social media provided a collective space for women to share their experiences with sexualized violence, scholar Kimberlé Crenshaw noted the importance of drawing from shared experiences in activism against gender-based violence. While investigating how to move activism against gender-based violence forward in her 1991 publication, *Mapping the Margins: Intersectionality, Identity Politics and Violence Against Women*, she explains that, "women have recognized that the political demands of millions speak more powerfully than the pleas of a few isolated voices," (p. 1241). However, while a collective voice is powerful, she notes that an important part of such work is the inclusion and understanding of differences in our collective understanding of gender-based violence. Noting that, "the violence that many women experience is often shaped by other dimensions of their identities, such as race and class," (p. 1242) Crenshaw calls for a greater understanding of intersectionality when it comes to the expression of group politics. That is, that women's experiences with violence and harassment are not homogenous, but rather shaped by a myriad of factors including race, sexuality, class, and ability.

A major factor in the differences between how people experience sexual violence and harassment lies in the historical contexts that have played a role in the construction of rape culture. In *Redefining Rape: Sexual Violence in the Era of Suffrage and Segregation* (2013) Estelle B. Freedman examines the ways in which the social and legal constructions of rape have shaped sexual and political privilege. While Freedman's investigation looks primarily at American history, many of the lasting impacts of these histories are echoed across North America. Through a historical examination that spans the colonial era to the present, Freedman explores how culture and ideology have been shaped by the definition of rape. She situates her research in the definition of rape because as she notes, "the way we understand rape helps determine who is entitled to sexual and political sovereignty and who may exercise fully the

rights of American citizenship,” (p. 11). Paying particular attention to the intersection of race, gender and citizenship, she discusses the historical instances and present-day implications of issues such as the public’s disbelief of black women’s experiences with sexual violence and the differing treatment of white women whose experiences are often privileged over others. For example, she explains how the late nineteenth century definition of rape was shaped by the racial belief that black women could not experience sexual violence and that black men were a threat to white female virtue. While historically the character and chastity of white women who experienced sexual violence has been questioned, the barriers to accessing justice have been even more difficult for black women. Social institutions did not play the only role in creating additional barriers for those that were not white women. White women activists in the late nineteenth century, such as the suffragists, paid little attention to the societal attitudes that perpetuated violence against black women. When considering the progression of present-day discourses surrounding rape culture, this historical context provides a lens for further analysis about whose experiences are privileged over others and how other’s experiences can be prioritized.

As I worked towards collecting and visualizing information about how people imagine supportive environments in the context of combating rape culture, it was integral to recognize the diverse ways that people are impacted. Freedman’s insights were particularly important to me in considering whose experiences have historically been validated and how the impacts of that resonate today. While social media, for example, has created a space for more women to share their experiences with sexual violence and harassment, those who are marginalized still face barriers to having their experiences validated. Freedman’s overview of the ways that history has shaped social and cultural views of rape and rape culture gives further insight into why women experience sexual violence and harassment differently based on other dimensions of their identities. Recognizing the ways that people’s experiences with rape culture have been shaped by historical contexts, such as valuing certain experiences over others, was an important aspect of the decision to visualize the diverse ways that people imagine supportive environments. As these histories play a role in shaping people’s experiences today, diverse experiences must be met with diverse ways of providing support. I worked to explore this idea through my visualization considering how the diversity of people’s lived experience necessitates different ideas for support.

In considering how to gather and represent diverse experiences, Kim TallBear's essay, *Standing With and Speaking as Faith: A Feminist-Indigenous Approach to Inquiry* (2014), provided a framework for more community-engaged research methods. Through her own experience within the fields of science and bioethics as well as through the lens of Indigenous governance, TallBear discusses the notion of *standing with*. Building on the concept as introduced by Donna Haraway, TallBear describes *standing with* as an approach to working with community groups that is egalitarian rather than top-down. She suggests that research can be approached as, "an opportunity for conversation and sharing of knowledge, not simply data gathering," (p. 2) and proposes a re-framing of research activities by discussing her own experiences engaging in projects that prioritize research as an opportunity for relationship building and give and take. As working with participants to gain diverse insights was a cornerstone of my research, framing it within the concept of *standing with* provided further ground to ensure a community-focused approach. Working within the notion of *standing with*, it is also important to consider, that while there is immense value in using methods such as participatory design to gain insights into a diversity of perspectives, a community-focused approach also necessitates a constant examination of one's own position as a researcher.

Actionable Insight: Taken together, Crenshaw's *Mapping the Margins* and Freedman's *Redefining Rape* provide rich insight into considering the diverse ways that rape culture is experienced. Further, the concept of *standing with* provides a framework for considering how to bring together those diverse experiences in a community-minded manner.

While the concepts of *casual information visualization* and *speculative visualization* provide some insight into how Crenshaw, Freedman and TallBear's ideas can be visually explored, as mentioned previously through the description of *The Monument Quilt*, there is a particular visual culture that must be considered when working with feminist subject matter. *Curating Difficult Knowledge* (2011), a collection of essays by editors Erica Lehrer, Cynthia E. Milton and Monica Eileen Patterson, along with Anne Cvetovich's *An Archive of Feelings* (2003) provide a further feminist lens on the visualization of personal information that deals with larger social issues.

In *Curating Difficult Knowledge*, editors Lehrer, Milton and Patterson bring together twelve essays with diverse perspectives on bearing witness to difficult knowledge. Described as subject matter that is, "violent, gruesome, horrific, and painful," (p. 7) while the difficult knowledge discussed throughout the book deals primarily with geographical conflicts, the broad

insights into how to deal with such subject matter can also be applied to the difficulty of dealing with social issues such as rape culture. First, Lehrer et al., use the term curate with its root meaning of 'caring for' to considering not only museum and exhibition spaces, but also less traditional curated spaces such as virtual locations. Within this lens, I was able to think further about the role of social media as a space for bearing witness to shared experiences of sexual violence and harassment. As Lehrer et al., refer to a sentiment expressed by Susan Sontag in the book's introduction, "more difficult than regarding other people's suffering may be scrutinizing our own habituated responses to it," (p. 7). While our responses to bearing witness to shared experiences of sexual violence and harassment will vary based on our own lived experiences, the provocation to scrutinize our responses to other's suffering prompted me to look at these issues from the lens of how we can reimagine supportive environments. Using creative practices to deal with difficult knowledge is discussed throughout the book, as in the introduction to the book's *Visualizing the Past* section by Monica E. Patterson. Patterson discusses how art can be productive in the creation of spaces that address challenging issues. She notes how art offers less literal forms of expression, such as the use of conceptual imagery to address an issue metaphorically, which can make difficult topics easier to discuss. As such, Patterson sees curation practices that deal with difficult knowledge as also contributing to activist practice (p. 90).

Actionable Insight: As I worked to encourage people to move beyond witnessing online testimonies of experiences with sexual violence and harassment towards reimagining spaces of support, *Curating Difficult Knowledge* provided insight into how less literal forms of representation can assist in the visualization and discussion of otherwise painful subject matter.

While *Curating Difficult Knowledge* explores the visualization of difficult subject matter through the lens of the impacts of global conflicts, in *An Archive of Feelings* (2003) Anne Cvetkovich uses trauma studies to explore representations of more personal instances of trauma. Specifically exploring representations of queer women's trauma, Cvetkovich examines the unconventional forms that depictions of this trauma take including creating entirely new forms of expression or performances that invite people to collectively bear witness to trauma. She explains that the unspeakable and unrepresentable nature of trauma, paired with the fact that it is often marked by disassociation means that often there is no record of trauma. Thus the unconventional forms that representations of trauma take require unconventional archives. One such archive that Cvetkovich draws attention to is the Lesbian Herstory Archives (LHA) located

in Brooklyn, New York. Drawing from the LHA, a grassroots, community-based archive that as a physical space houses the stories of queer people, she notes the importance of providing spaces for stories and experiences of trauma. Of particular note when describing the LHA as an important space for archiving trauma are its physical attributes as a cozy space. Located in a house that elicits the experience of visiting a friend's house rather than visiting a library, visitors are welcomed to browse comfortably leading Cvetkovich to note, "...one of the persistent values of grassroots and community-based archives is their capacity to keep the emotional need for archives at the forefront of their mission," (p. 250). While she goes on to differentiate these goals and practices from those of research institutions, this statement was particularly interesting to me as an analysis of the capacity of spaces to prioritize emotional information.

Actionable Insight: Considering the Lesbian Herstory Archives as a reference point for an emotional space, I was able to more deeply consider how to visualize emotional data that aimed to evoke a greater understanding of supportive environments.

Investigating how to visualize affective, qualitative data, especially situated within the subject matter of combating rape culture, requires a framework that draws from a variety of theories and practices. As the design concepts of adversarial and speculative design provide a broad reference point for projects that aim to provoke imaginative discussion and debate, emerging data visualization practices provide more specific points of reference for how to engage in thought-provoking work through the visualization of information. The practices of casual information visualization and speculative visualization help to situate this research within an emerging field of visualizing non-traditional data in projects that aim to evoke or portray more complex emotional insights. Combining these frameworks with the engagement of feminist scholars ensured the relevance of this research within broader activist work against gender-based violence.

Taken together, the concepts and theories throughout this section provided a theoretical framework to explore the collection and visualization of affective, qualitative data. When considering the research methodology and project development, I was particularly interested in the following insights I gathered from the concepts and theories outlined above:

- Considering how design can be used for discussion and debate through the creation of agonistic spaces that encourage imaginative solutions
- Building a creative environment to elicit an emotional engagement with information

- Communicating insights provided by participants by example rather than words
- Utilizing both analog and digital technologies as methods of engagement
- Fostering spaces to consider creative solutions for a society where rape culture is not deeply ingrained in social systems
- Considering the construction of spaces in relation to the witnessing of stories of sexual violence
- Utilizing layered imagery to convey a multitude of ideas
- Engaging in research at all stages with an intersectional feminist lens that recognizes that women's experiences with violence and harassment are not homogenous
- Approaching research with a *standing with* approach, centering speaking with people rather than speaking for them

A greater understanding of the historical contexts where a culture of gender-based violence in North America has been perpetuated, as well as the work that visual culture has played in working through trauma provides a rich conceptual framework for considering the subject matter that this research worked to visualize. As this research worked to contribute to the fields of casual information visualization and speculative visualization while also contributing to ongoing conversations about combating rape culture, I brought these concepts together to engage audience in considering the issue of rape culture in ways they may not have considered it before.

Research Methodology

Cultural Probe Kits as Qualitative Research Method

Through an interdisciplinary theoretical framework, this exploration into how to gather and visualize affective, qualitative data worked to build on emerging practices in data visualization through a combination of adversarial and speculative design. In addition to building on these practices and concepts, it was also situated within feminist discourses on combating rape culture. Within this framework, I used a participatory design methodology to gather the data that I used toward the exploration of qualitative, affective data visualization. Since I was particularly concerned with visualizing a diversity of experiences through a *standing with* approach, I found that participatory design methods were well suited for engaging in research in a way that

prioritized the voices of participants, rather than speaking for communities. As participatory design methods center the contribution of participants as direct contributors to the design process, I saw an opportunity to challenge more traditional hierarchical research structures. I viewed participants as part of a community of contributors to the project. Additionally, as participatory design methods are based on creative forms of gathering data, they provide an opportunity for the collection of more emotional and imaginative information than traditional survey or questionnaire-based methods of data collection. To provide an overview of this research methodology I will first broadly discuss the merits of creative forms of inquiry as qualitative research methods. Next, I will describe and contextualize the specific participatory design method I used to undertake this research: cultural probe kits, as well as a description of the development and design of the cultural probe kits used in this research. Finally, as cultural probe kits are traditionally analyzed differently than other qualitative research, I will discuss how the literature surrounding cultural probe kit analysis informed the analysis of this research data.

Engaging in qualitative research through creative inquiry can provide unique insights that might not otherwise be uncovered through other forms of qualitative research such as surveys or interviews. I use the term creative inquiry as an umbrella term to consider forms of qualitative research situated in both art and design practice. Ephrat Huss and Julie Cwikel discuss the unique insights that can be gathered from creative inquiry through a project in which they worked with Bedouin women on concerns of violence, poverty, and health problems in their communities (Huss and Cwikel, 2005). This was part of a larger project they had been working on to facilitate discussions amongst the women about solutions for change, however they were unable to make much progress. While a first hypothesis was that the issue lay in a cultural pressure to keep concerns private, when the women were asked to draw their experiences, the images they produced served as a rich starting point for discussion. The ability for the women to see their experiences differently, as many aspects were brought together on one page, enabled more fruitful discussions. Additionally, the emotional responses stimulated by the images galvanized the women to move from imagining solutions to actively organizing for social change.

In *Arts-based Research as Social Justice Activism - Insight, Inquiry, Imagination, Embodiment, Relationality* (2011) Karen Keifer-Boyd provides a further framework for how arts-based research can be undertaken from a feminist, critical, and postcolonial lens. While Keifer-Boyd engages this framework from the lens of art practice, I argue that it can be extended into design

practice. She suggests that art-research as a critical, reflexive response to injustice can also align with feminist art activism that responsibly listens to marginalized voices, bears witness, stops harmful activities and envisions new participatory world views, particularly participatory economic and democratic structures. One example of this that she employs is Augusto Boal's *Theatre of the Oppressed* (1985). A participatory theatre practice wherein audience members are invited onstage to demonstrate ideas for change, *Theatre of the Oppressed* provides opportunities for audience members to not only imagine solutions, but also enact them. Broadly, creative inquiry as a qualitative research method enables the collection of imaginative information that can engage both participants and researchers in more reflexive discourse.

To creatively engage in inquiry I used cultural probe kits. First introduced by Bill Gaver, Tony Dunne and Elena Pacenti in 1999 as a design research method that could provide deeper insight into people's daily lives, thoughts and interactions, cultural probe kits are made up of materials such as postcards that participants can engage with (Gaver et al., 1999). Designed for a project about using interaction technology to increase engagement of elderly people in their local communities, the original goal of cultural probe kits was to better understand an unfamiliar group. Specifically, in developing a project for these groups, Gaver et al. wanted a way to engage the groups in meaningful discussion. The cultural probe kits used in this test case for the research method included postcards, maps, a camera, and a photo album and media diary. The postcards sought to gain insight into, "...the elders' attitudes towards their lives, cultural environments, and technology," (p. 23) through questions such as, "Please tell us a piece of advice or insight that has been important to you." These questions were obliquely worded and the postcards included images to evoke a wide range of responses. To gain a greater understanding of the relation of participants to space, they were asked to mark zones on local maps indicating, for example, where, "They liked to daydream," (p. 23). The camera, photo album and media diary each gathered images in different ways to gain insight into what participants found meaningful. Participants were asked to use the camera to take pictures of things such as their home or what they would wear that day. They were asked to tell their story through the photo album using 6 to 10 pictures. Finally, through the media diary participants were asked to make notes about their technology use such as their use of radio and television as well as their phone calls. Ultimately, Gaver et al. found that the use of cultural probe kits was successful in familiarizing themselves with the site they were designing for. However, more than providing insight into the site, they noted the impact it had on participants, encouraging them to think about their role in the project. Since Gaver et al.'s first use of cultural probe kits, they have

been widely used in design research. I looked back to this first example to ground my understanding in the ways that cultural probe kits have been used over time.

Following the first introduction of cultural probes kits as a research method, they were taken up by a variety of disciplines as a valuable opportunity for gaining deeper insights into people's behaviours and everyday interactions. In particular, those in the field of Human Computer Interaction (HCI) took them up. Interested in eliciting more personal insights into users, HCI researchers have turned to a number of social science-based disciplines to investigate aspects of people's social lives, particularly in relation to their uses of technology (Graham et al., 2007, p. 29). As cultural probe kits have been embraced as a valuable research method, there have been a number of interpretations of how probes can be developed and used.

In *How Probes Work* (2007), Connor Graham, Mark Rouncefield, Martin Gibbs, Frank Vetere and Keith Cheverest survey how probes have developed since Gaver et al.'s first introduction of them. Using the term probes as an umbrella term to consider not only cultural probe kits, but also "Informational Probes, Technology Probes, Mobile Probes, Empathy Probes, Domestic Probes, and even Urban Probes," they reorient the conversation about the uses of probes, and how probes as a research method can be further developed. Understanding cultural probe kits in this broader context was particularly interesting when it came to cultural probe kit development. As cultural probes are a flexible research material, it was useful to gain insight into different methods for collecting similar kinds of information. Finding commonalities amongst the different types of probes, Graham et al., frame probes as: capturing artifacts, gathering (auto)biographical accounts, making the invisible visible, positioning the participant as expert, and evoking dialogue and conversation.

Within these commonalities, Graham et al., point to *The Digital Care Project* as one demonstration of how probes work. Particularly interesting in regards to this research is how to conduct research in sensitive settings, *The Digital Care Project* worked to develop, "appropriate assistive and enabling technologies across a number of residential care settings: a hostel for former psychiatric patients; a number of elderly people living at home; and a stroke victim and her family," (p. 31). With particular attention paid to how staff exchanged messages and used pictures as part of their work, the probe packs included: a journal structured into three parts including a photo diary, message book and ideas book, a Polaroid and disposable camera, PostIt notes, glue and pens. In each part, participants were asked to provide insight into their

reflections and actions. For example, participants were asked to reflect daily on the message boards and notices they frequently used, as well as to take photos of things like information that has to be made public. In discussing the outcomes of the kits used for this project, Graham et al., reflect on how the reflexivity enforced by the probes encouraged an awareness of the participant's relationship and action with others. As *The Digital Care Project* was particularly concerned with how to collect sensitive information, it provided an important reference point for my research. When developing my own cultural probe kit activities I considered reflexive activities that encouraged participants to reflect on their own actions and others.

Ultimately, the combination of materials and the prioritization of the human experience in *The Digital Care Project* resulted in the aggregation of a more textured terrain of information. As cultural probe kits can provide such complex insight, I found it particularly relevant to use cultural probe kits in the context of my research. Situated in an understanding that people's experiences with rape culture are varied, based on their lived experiences, and within a complex history of the perpetuation of sexual violence in North America, cultural probe kits provided a method for aggregating information about people's experiences to creatively gather diverse insights.

Cultural Probe Kit Development

The goal of developing the cultural probe kits used in this research was to gather information about participants' understanding of rape culture, and the tools they think are necessary, or the tools they wish existed to fight against it. The kits were designed around three themes:

- 1. Investigating participants' trust in dominant systems for dealing with instances of sexual violence and harassment.** For example, their thoughts about how the criminal justice system deals with cases of sexual violence.
- 2. Gaining insight into participants' experiences with 'everyday impacts' of rape culture.** For example, seeing a movie scene that perpetuated the normalization of sexual violence and/or harassment.
- 3. Engaging in speculative visioning.** This theme explored the tools that participants wish existed to combat rape culture. It also investigated the types of objects that participants found empowering in the context of combating sexual violence and harassment.

Together, these themes worked to contextualize the concept of rape culture, understand participants' relation to it, and to gain insight into what they envisioned as supportive and empowering environments. I hoped to engage participants in exercises where they both considered the everyday impacts of rape culture while encouraging them to consider what a world without rape culture might look like. To explore the three themes I developed four activities: a word association worksheet, a set of 'complete the picture' postcards, a photo exploration exercise, and a free-draw, each of which I will explain in detail below. In developing the kits I worked to have different points of engagement with the subject matter for two reasons. First, I wanted to develop activities that encouraged the sharing of a variety of ideas. I worked to make the activities open-ended enough for people to share their viewpoints and experiences, while not making them so open-ended that it would be confusing to participants. Second, I developed the kits with an understanding that the difficulty of the subject matter and the complexity of people's lived experiences required the creation of points of engagement that were malleable enough that participants would feel comfortable sharing their perspective. Additionally, as the ultimate goal of the kits was to gather insight on objects and spaces that participants found supportive and empowering, I worked to develop activities that prioritized a sense of positivity and imagination.



(Figure 8. Cultural Probe Kit distributed to participants)

In addition to the four activities that made up the kit, I also developed an introduction package for participants. This included a letter that framed the kit activities within the broader research

project. Participants were informed about the goals of the project: to create an imaginative, digital space that encompassed the diverse needs that need to be met in the ongoing work to combat rape culture. The concept of rape culture was also described in the introduction providing all participants with the same working definition of the term. Recognizing that the concept of rape culture could be triggering for participants, a list of resources, including 24-hour crisis lines, was also provided to participants.

ACTIVITY 1: WORD ASSOCIATION

Please circle the words you associate most with reporting sexual violence to the police:

Necessary	Inconsequential	Supportive	Discouraging
Sympathy	Insensitive	Effective	Pointless
Accessible	Inaccessible	Justice	Harm
Other: _____, _____, _____			
Reflections:			

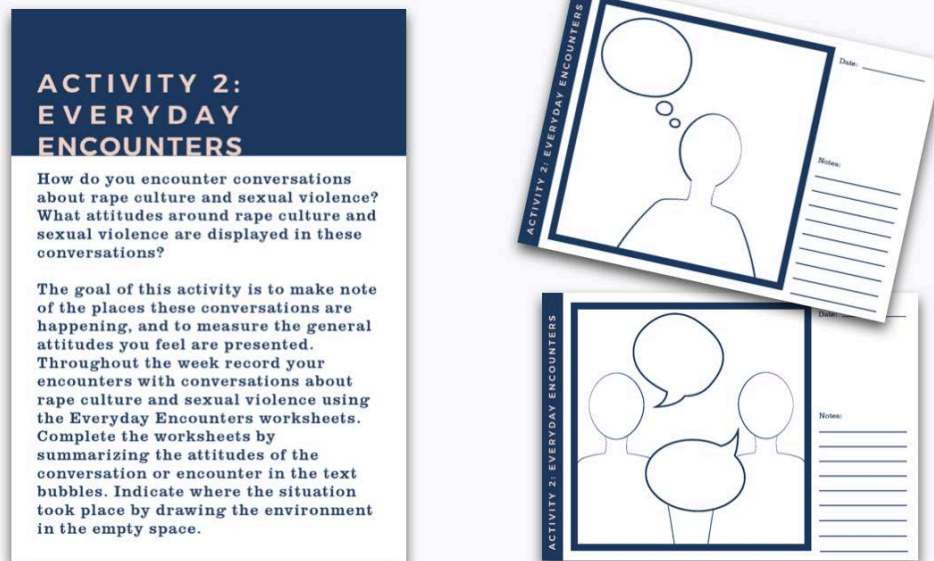
Please circle the words you associate most with sexual assault trials:

Justice	Inequity	Fair	False-Accusations
Accurate	Accessible	Inaccessible	Supportive
Oppressive	Accountable	Adequate	Useless
Other: _____, _____, _____			
Reflections:			

(Figure 9. Word Association Activity)

While the ultimate goal of the cultural probe kits was to gather information about supportive environments, I wanted to ensure I set the context that the kits were about imagining these supportive spaces in the context of combating rape culture. As such, there were two activities that investigated participants understanding of rape culture. For the word association (Figure 9), participants were asked to circle the words they associated with dominant institutions' relationship to sexual violence. This included asking about words that participants associated with reporting sexual violence to the police, with sexual assault trials, with college and university sexual assault policies and procedures, and media coverage of sexual violence. The words to circle included options such as, fair, bias, survivor-centric, victim-blaming, etc.... There were also three blank lines underneath the word association question where participants could add

their own words as well as a blank space for participants to share their reflections about the words that they circled and added.

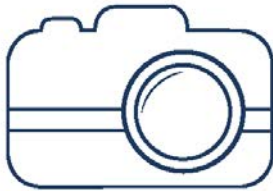


(Figure 10. Everyday Encounters Activity)

The second activity, titled *Everyday Encounters* (Figure 10) asked an overarching question, “How do you encounter conversations about rape culture and sexual violence? What attitudes around rape culture and sexual violence are displayed in these conversations?” An important aspect of this activity was that it was not meant to explore instances of sexual violence, but rather instances of rape culture, namely those displayed in conversations with others or through media. Participants were given comic-style postcards to make note of conversations where they felt attitudes that perpetuated rape culture were displayed. The postcards were divided into two sections. On the left side of the postcard was a square with a comic-style scene including the outline of one or two people (two types of postcards were designed to provide options to participants). Participants were asked to draw details about the context of the moment in the blank square. For example, was it a conversation they saw online, on television, or a conversation they had with another person? On the right side of the postcard was space to describe the moment they are referring to in the image. Participants were also asked to provide a date for the moment. This was included because in the context of today’s 24-hour news cycle, the way we engage with media changes quickly. When analyzing the moments that participants referred to in this activity, I wanted to ensure that I had a frame of reference for the timing.

ACTIVITY 3: PICTURE THIS

Using the included disposable camera take at least 10 photos, one for each description listed on this card. These photos can be taken anywhere.



1. Something beautiful
2. Something you like to read
3. Something that brings you joy
4. Something comforting
5. Something empowering
6. Your favourite time of day
7. Somewhere you feel safe
8. Your favourite object
9. Your favourite colour
10. Something you want

Note: You are invited to use the remaining frames (up to 14) to take additional pictures. Please provide descriptions for these images in the space provided on the back of this card.

(Figure 11. Picture This Activity)

As the first two activities worked to set the context of the subject matter, the third and fourth activities collected aesthetic data about supportive environments and empowering objects. For the third activity, participants were given a disposable camera and a postcard with instructions for the activity (Figure 11). They were asked to use the camera to take ten pictures, one for each description listed on the postcard. The descriptions were as follows:

1. Something beautiful
2. Something you like to read
3. Something that brings you joy
4. Something comforting
5. Something empowering
6. Your favourite time of day
7. Somewhere you feel safe
8. Your favourite object
9. Your favourite colour
10. Something you want

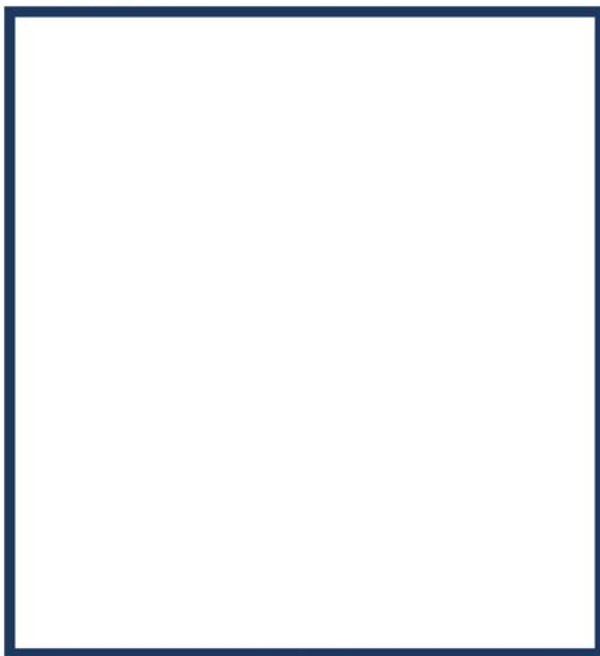
Participants were also invited to use the remaining frames to take additional pictures and provide descriptions for the images on the reverse side of the postcard. The goal of using a broad statement for this activity was to leave ample room for participant

interpretation. As the other activities had the goal of bringing participants into the mindset of combating rape culture, asking participants to take photos based on these descriptions worked to gather visual information about more positive aspects of their daily lives.

ACTIVITY 4: DRAW IT

Draw your own space of empowerment and support. Imagine the below rectangle is the outline of a room. What objects, furniture, technology etc.... would you want in a space where you feel entirely supported?

Note: No idea is too big! Your room can include objects with magical powers or technology that gives you supernatural abilities. Or, it can be full of nostalgic memories. Let your imagination run free.



(Figure 12. Draw It Activity)

For the last activity participants were given an almost blank piece of paper (Figure 12). They were asked to imagine that the page was an outline of a room, and in it they were asked to draw their own space of empowerment and support. They were asked: what objects, furniture, technology etc. would you want in a space where you feel entirely supported? They were encouraged to demonstrate any idea they had in mind. To do this, the worksheet included a note that read, “No idea is too big! Your room can include objects with magical powers or technology that gives you supernatural abilities. Or, it can be full of nostalgic memories. Let your imagination run free.” The goal of this activity was to work in tandem with the photographs participants were asked to take. While the

photographs were used to gather information about objects or spaces that participants had access to, this drawing activity encouraged participants to engage in more imaginative brainstorming.

While participants completed the cultural probe kits individually, as a means for collecting data, they were rooted in a participatory design approach through exercises that encouraged participants to liberate themselves from preconceived notions about how to engage with conversations about combating rape culture. Acting as more than just vessels for consultation with participants, I designed the kits to encourage a more active consideration of how they engaged with the concept of combating rape culture in their day-to-day lives.

The kits were developed and distributed from June to August in the summer of 2017. Participants were self-selected by replying to a call-out on my social media networks, specifically Facebook and Instagram. The recruitment post briefly described the project, indicated that the activities would be mailed to participants, and could be completed anywhere. I recruited participants through social media as I had access to a large online network. As I was undertaking this research in the summer, a time when University campuses are quiet, I felt I would have a higher rate of engagement through recruiting participants online. Additionally, I had participants self-select because I undertook this research with an understanding that rape culture affects everybody. While it affects survivors of sexual harassment and violence differently than those who have not directly experienced sexualized violence, I was interested in gathering a diversity of experiences. For those who expressed interest in the project, I sent a follow-up e-mail with a more detailed description of the project and the activities participants would find in the kit. As cultural probe kits are more labour-intensive than other forms of research, I wanted to ensure that participants had as much information as possible before committing to the project. Ultimately, I sent 16 kits to participants across Canada spanning the provinces of Alberta, Quebec, Ontario and Nova Scotia to participants in both large cities and small towns. Participants came from diverse lived experiences with a small number identifying as survivors and others not directly identifying as such. Additionally, some of the ways that different participants identified included disabled, queer, racialized, and Muslim. The majority of participants were women, with one participant identifying as a man.

Design Research and Process

Out of the sixteen kits that I distributed I received twelve back, and as cultural probe kits are not meant to be rigidly analyzed, I gathered findings from the kits through an interpretation of the data. To inform how I could undertake this interpretation, I reviewed existing literature. In *How HCI Interprets the Probes* (2007) scholars Kirsten Boehner, Janet Vertesi, Pboebe Sengers and Paul Dourish undertook a comprehensive review of the literature regarding the use of cultural probe kits in Human-Computer Interaction. They found that many studies in HCI saw the uncertainty of working with cultural probe kits as a problem, and worked to find respondents' 'true meanings' through, "...follow-up interviews, statistical methods such as graphic or numerical analysis, or cross validation of results," (Boehner et al., 2007, p. 1080). However, as the richness of cultural probe kit information comes from its individualized nature, some scholars believe that using approaches to synthesize data to produce more easily comprehensible results takes away from the possibilities associated with cultural probe kits as a creative method of data collection. Gaver et al., speak to this in *Cultural Probes and the Value of Uncertainty* (2004). They note that the nature of cultural probe kits as influenced by both the kit designers and the participants makes them, "... impossible to analyze or even interpret clearly because they reflect too many layers of influence or restraint," (p. 55). They differentiate this from other research methods because, while researchers influence the design of materials such as questionnaires or experimental tasks, these methods also aim to minimize subjectivity in their analysis. However, cultural probe kits as originally introduced by Gaver are unapologetically subjective. Rather than considering the cultural probe kits as a method with which Gaver et al., can look inside their participants' heads, they challenge themselves to undergo their own subjective interpretations. By doing this they note, "We have to see our volunteers in terms of their own experiences, understanding their responses empathetically, not intellectually," (p. 55). As I used cultural probe kits to gather rich, diverse data from participants, I was particularly concerned with preserving this information through the interpretation process.

However, while an emphasis is put on subjective interpretation of cultural probe kits, Boehner et al. note that there is scarce information on the interpretation process itself. While this makes sense when considering that cultural probe kits should be developed

based on the unique interest of the research project and participants, a greater emphasis could be put on individual interpretation methods, even if they are unique to specific research projects.

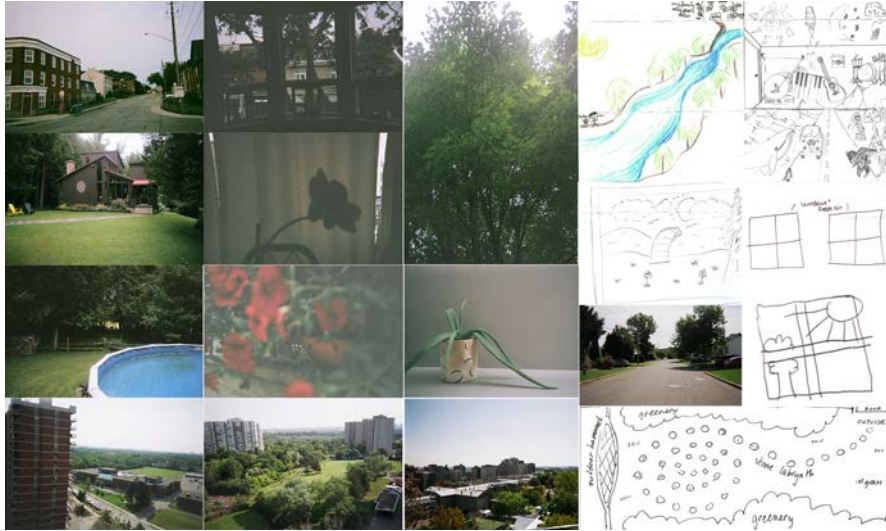


(Figure 13. Unpacked kits)

For the purpose of this research, I interpreted the twelve cultural probe kits that were returned to me in three stages. As one of the activities was completed using a disposable camera, I had to develop the participant's photos first. Following photo development for this first stage, I wanted to gain a global understanding of the information. I unpacked the returned materials from each box and laid them all out in a circle on the floor (Figure 13). When organizing the materials for this overview, I kept all of the materials for each participant together, ensuring that I was also able to get an overview of each individual participant's responses. For example, I first unpacked the material returned by participant one and laid out the responses to each activity in order from one to four (beginning with the word association activity and ending with the drawing exercise); I repeated this step for each kit, forming a large circle on the floor. Sitting on the floor, I looked at each kit individually, carefully reading through the returned information and examining the visual information returned in both the photos and the sketches. With the information laid out on the floor in front of me I was also able to gain a global overview by standing up and scanning all of the information, especially the visual responses. I wrote down my first impressions of the data and the initial themes I saw emerge. I built on this process in the second stage of interpretation. As the volume of information took up a lot of physical space when laid out on the ground, I wanted to

see if I could interpret the information differently if it were organized digitally. However this time, rather than organizing the materials by participant, I organized them by activity. While exploring the materials by participant provided context to their submissions, as each activity addressed different subject matter I hoped to uncover themes within each subject area. For the word association activity, I created a single word document with all of the participants' responses. For activity two I scanned the postcards and created a contact sheet so I could easily view all of the responses together. As I had received digital copies of the developed photos from activity three, I used those files to create a contact sheet organized by participant based on the camera they used. Finally, I also scanned the fourth activity, but did not create a contact sheet, as I wanted to be able to look closely at the details of each drawing. I reviewed this information again by opening the files specific to each activity one at a time. I added to my first impressions of the data as well as emerging themes, adding new ideas and building on my initial reactions. After examining the returned materials through two different stages, I then looked at the information I had gathered and reflected further on the meaning of the information participants had chosen to submit.

Outside of the lack of information provided in the literature related to cultural probe kit interpretation, I faced one other challenge in interpreting the research as outlined above. For the picture-taking activity, I had deliberately chosen disposable cameras for participants to take pictures with rather than a phone camera. I wanted a specific object to be dedicated to the kit itself, rather than for participants to have to remember to use their phone to take photos, or for them to have to remember to upload and send the images to me in addition to returning the kit by mail. However, as disposable cameras are not commonly used today, there were some issues with the photos participants submitted. Mainly, some images were too dark to interpret, and in one case the whole film was taken in such low lighting that none of the images could be developed. However, despite this issue, I was still able to gain rich insights from the information submitted by participants.



(Figure 14. Images of nature submitted by participants)

Participants responses to the words they associated most with sexual assault policies and procedures on college and university campuses:

Discouraging, Public Relations, Bias, Necessary, Fear-Driven, Reluctant, Late-Coming

"Rape culture on post-secondary campuses is so pervasive yet ignored and quieted. They are completely centred around the universities public persona (i.e. under/not reported) and further marginalize and traumatize survivors often times forcing them to change their lives to accommodate the perpetrator. It's also normalized through songs and cheers, under the guise of 'good fun.' I have a friend who was raped 2x on campus."

Discouraging, Bias, Necessary, Hypocritical

"Discouraging is twofold: the process is (seems) discouraging which makes the ideas of disclosure discouraging"

Discouraging, Public Relations, Bias, Necessary

Discouraging, Necessary

"While necessary, frustrating that policies ≠ resources"

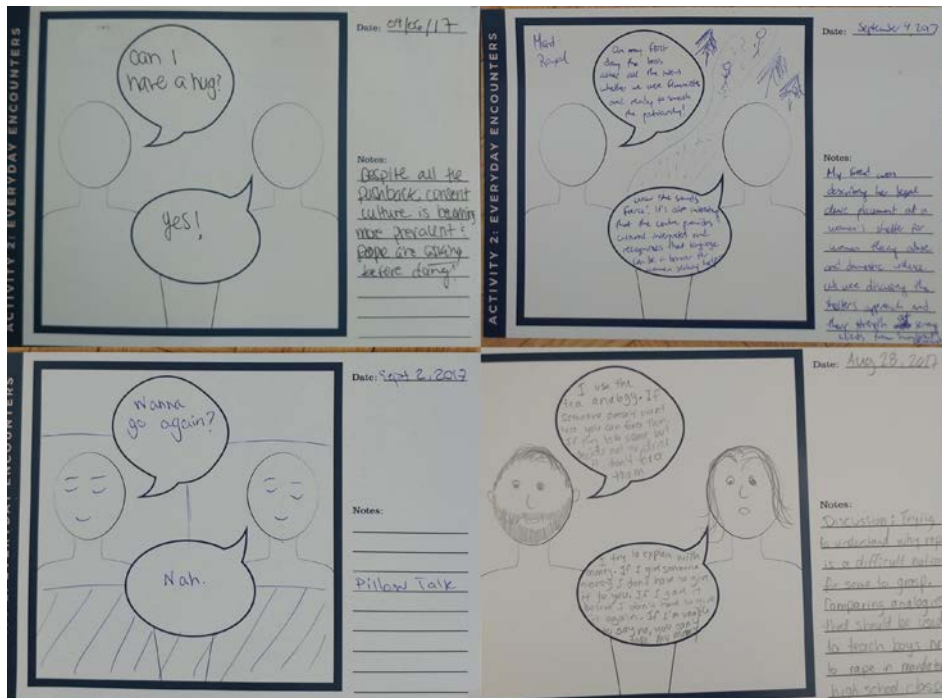
Discouraging, Public Relations, Useless, Necessary

"The words I chose represent my feelings about how sexual assault polices and procedures on campuses currently operate. They should be student-centric, pro-survivor, and intersectional"

Discouraging, Public Relations, Useless, Necessary, Self-Serving, Strategic, Insensitive

"Changes to policies and procedures on campuses are not happening quick enough to reflect the epidemic of campus sexual assault."

(Figure 15. Participant's responses to the words they associated with sexual assault policies and procedures on college and university campuses)



(Figure 16. Positive encounters and interactions displayed in participant's responses)



(Figure 17. Images of comforting spaces submitted by participants)

Through the interpretation method outlined above, I found the returned cultural probe kit information displayed the following themes:

- Images of nature as empowering and comforting (Figure 14)

- A need for policies and procedures to address sexual violence on college and university campuses (*Figure 15*). However, while participants noted this need, they also displayed pessimism about the positive impacts of current policies and procedures
- Examples of positive encounters and interactions that participants felt embodied a move away from rape culture (*Figure 16*)
- Images of physical spaces such as home, and specifically bedrooms, as places of comfort and empowerment (*Figure 17*)

These themes were gleaned overwhelmingly from the aesthetic-based activities. While it was clear that the first two activities provided the context of the research, I found the third and fourth activities (the disposable camera and drawing exercise) produced particularly interesting information. The ability for participants to give me insight into the things they found empowering, supportive and comforting through images seemed to provide more possibilities for communicating responses. While this is likely also a result of the openness of the descriptions provided in each activity, as explained above, it is also a unique benefit of using creative methods of data collection. In *Towards Connectedness: Aesthetically Based Research* (2006), Liora Bresler speaks to this benefit of aesthetically-based research. Speaking to the ways in which art can enhance dialogue, she says, “The arts provide the structure for a metaphor describing a commodious, rich space where caring, connection of self to other, occurs,” (p. 61). The activities that gathered aesthetic information enabled me to have a rich dialogue with the data.

The aesthetic information provided by participants also evoked an emotional response. The photographs and images provided a glimpse into the intimate details of participants’ lives. Whether it was the view outside their apartment window or their favourite book, the images provided a humanizing glimpse into people’s interactions. The ability for this information to evoke an emotional response was both a validation for using the cultural probe kits, and a challenge to preserve as I moved from gathering and analyzing data towards project development.

Out of the themes described above, the most surprising was the frequent images of nature as empowering and comforting. These images, included in both the photographs and sketches, overwhelmingly depicted images of landscapes and sketches of trees and

skies. In the context of the overarching question of what participants wish existed in the fight against rape culture, they overwhelmingly chose to show physical spaces where they could be alone and connect with nature. While this research began in the context of considering the ways that social media forums provide a space for community and solidarity in the fight against rape culture, by asking participants more broadly about any spaces they view as empowering and comforting, they communicated that a reflection on the role of nature is clearly also an important part of this work. While participants also spoke to interactions they had online, and to their computers and mobile devices as empowering and supportive objects, these images were present so frequently that they could not be ignored. It led me to reflect on how considering the role of fostering connections with natural or outdoor environments may help with a more balanced approach to fostering spaces of support in the work of combating rape culture. Ultimately, these insights encouraged me to further explore the role of different types of supportive spaces or environments outside of social media. I began to consider how to deviate from social media as a main model for exemplifying spaces of support.

In considering other models for exemplifying space of support I was particularly interested in how when participants were asked to consider the tools and objects they wish existed in the fight against rape culture, they did not imagine tools and objects that are entirely different than what exists today. Participants showed that their vision for a world or space without rape culture does not need to be entirely different but it should foster a greater sense of freedom for everyone to enjoy the things that some people are more able than others to enjoy today.

Throughout the process of interpreting and reflecting on the information returned by participants I worked to ensure that I was not, as Gaver et al. noted, “trying to see inside their head” (p. 55). Understanding that I may never understand the ‘true’ reasons that participants chose to share certain data, the reflections that I had on the data were based on my reading of the information. While I did not work to glean an absolute meaning from the submitted data, I did aim to inform my reading based on the theoretical framework described above, that is, considering an intersectional feminist lens in my interpretation of the materials.

By using cultural probe kits to encourage participants to think about the issue of rape culture through a different lens, I was able to gain a unique perspective on the issue. For

example, considering how nature fits into creating spaces of support when it comes to combating rape culture. This insight was particularly important in relation to my exploration into what people imagine as empowering and supportive environments. It was clear from the data submitted from participants that these environments are diverse and exist in the physical world, digital space, and in one case where a participant drew a teleportation device, spaces that might not exist but where our imagination can be used to consider any possibility. As my interest in using a participatory research approach was also grounded in gaining diverse perspectives, cultural probe kits enabled me to do so. Of particular note are the diverse visions of hope that participants shared, specifically through the speculative visioning activities. This is particularly important when, as mentioned previously, considering the systemic causes and impacts of violence. While it is often the 'perfect victim,' that is someone who is white, cisgender, able-bodied, and heterosexual that has their voice heard when it comes to combating rape culture, the reality is that histories of colonization and racism have fostered a culture wherein it is those that are most marginalized that experience the most violence and aggression. As such, engaging with participants who have experience navigating the world with a disability, as queer, as Black, as people of colour, as visibly Muslim, and with marginalized immigrant experiences provided more representative insight into the ways in which different people interact with and understand rape culture. Ultimately, through cultural probe kits as a research method, I was able to think through diverse realities in dialogue with the creative materials returned by participants.

From Cultural Probe Kit Interpretation to Project Design

As has been discussed thus far, cultural probe kits are well suited for aggregating data regarding complex topics. As I was particularly interested in visualizing non-traditional information, using cultural probe kits provided an opportunity to collect various types of data about diverse aspects of rape culture from participant's understandings of the topic to their imaginative ideas surrounding empowering and supportive environments. With the goal of using cultural probe kits as a method for exploring how to collect affective, qualitative data about the diverse ways that people imagine supportive environments, I was interested in moving from the collection of this information to the visualization of it.

I began an iterative design process by first reflecting on two previous projects I made: *lockerRoomTalk* and *That Feel When....* Inspired by #NotOkay, one of the viral hashtags described previously, *lockerRoomTalk* (Figure 18), is an interactive, visual representation of the way that space can be reclaimed when people share their experiences with sexualized violence. The screen-based project displays a picture of a locker room where each locker can be clicked to reveal a tweet about people's individual experiences with sexual violence or harassment. Once all of the lockers have been opened, tweets begin appearing on all areas of the screen until it is entirely full. The project aimed to visualize that while sexually violent language is often dismissed as "just locker room talk," these ideas perpetuate sexual violence and harassment through the normalization of such ideas.



(Figure 18. lockerRoom Talk, 2016)

That Feel When... (Figure 19), is a web-based visualization of responses to nine written prompts that, though broad, have the potential to evoke moments in someone's day when they have experienced rape culture. The prompts included, "That feel when you're thinking twice about that outfit while deciding what to wear..." and "That feel when you're pretty sure you'll be blamed no matter what..." Responses to these prompts were collected through a publicly available Google form. At the end of the form participants were asked to provide a description about the ways that they identify (i.e. woman, man, straight, LGBTQ etc.). The visualization aimed to use these descriptors to explore trends within the experiences people have based on their identities with the goal of eliciting empathy and a broader understanding of complex social issues through personal narratives.



(Figure 19. That Feel When..., 2017)

Through both *lockerRoomTalk* and *That Feel When...* I used text-based, qualitative data to investigate how to visualize affective experiences in the context of social media as a digital space for fostering community. In both cases I discovered that bringing singular experiences together in digital space helped to visualize a network that provided information and insight into the broader social structures that uphold rape culture. While these projects conveyed the prevalence of sexualized violence, I found it was difficult to communicate the nuance of individual experiences through visualizing text-based data. As I considered how to move from the insights gained from the cultural probe kits I was interested in creating a space that visualized a cohesive message while working to further humanize these experiences with an image-based approach.

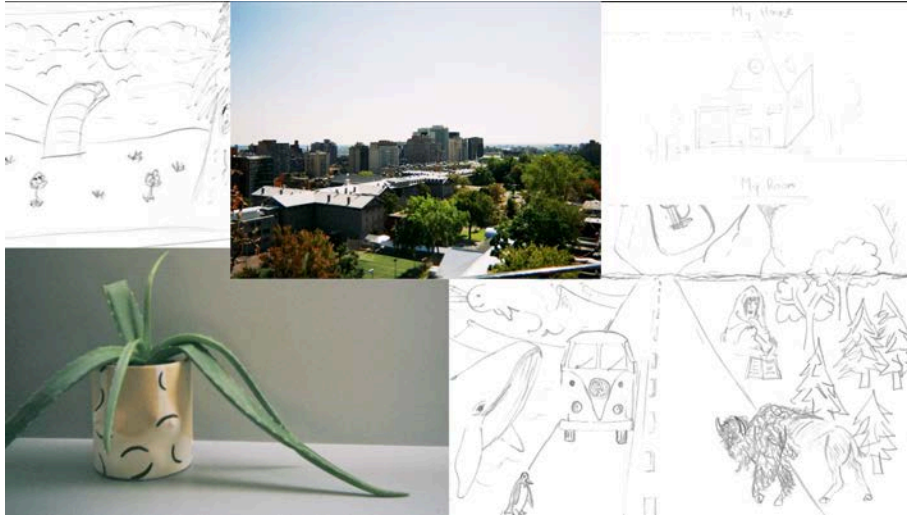
Similarly to the absence of information in the literature regarding practices for interpreting cultural probe kits, there is also an omission with respect to moving from the findings of cultural probe kits towards a final design project (Boehner et al., 2007). While cultural probe kit data is often used, as in the case of Gaver et al.'s initial introduction of the method in 1999, to gather inspiration from an unfamiliar group, I saw particular potential in working directly with the data that was returned from the cultural probe kits I developed. As I was investigating how to visualize empowering and supportive spaces through the cultural probe kits, I received direct answers to this question through the photography and drawing exercises. Working directly with the cultural probe kit returns was an unconventional use of cultural probe kit information as the data is usually used less literally. However, by working with the information more literally I saw an opportunity to visualize an unconventional form of data that I identified as better representing participants' feelings. Working with the returns in this way also provided the opportunity to interpret participant's information in a way that did not try and see inside their head. While I could have used materials returned in the cultural probe kits as inspiration towards creating a visualization from a different data set, or developed a further layer of visual interpretation over the submitted materials, I wanted to showcase the interesting materials that participants had submitted. I saw an opportunity in working directly with the materials returned by the participants to bring all of the images together, representing the diverse ways they viewed supportive and empowering environments.

As I found the most evocative results from the interpretation process to be the images of nature as empowering and comforting and the images of physical spaces such as homes, and specifically bedrooms, as places of comfort and empowerment, working directly with the images seemed most appropriate and as an opportunity to highlight these themes. I also thought that visualizing the materials from the photography and drawing activities - as they focused on the same broad theme of the spaces that participants found empowering and supportive - would provide an opportunity for focus in the final project rather than working to integrate the materials returned for all of the activities.

The choice to showcase the materials submitted by participants was also informed by the framework of projects that I investigated as inspiration for this research. As stated

previously, projects such as *The Monument Quilt* (2013) bring experiences of people who have experienced sexual violence and harassment together in one place, visualizing both the pervasiveness of the issue of rape culture and as way to create a space for community and solidarity. This is similar to the way that social media has been used in dealing with the issue of combating rape culture. I was interested in using the method of bringing different experiences together in one place to explore how to build on the ideas of *The Monument Quilt* and viral hashtags towards considering what support looks like in the context of combating rape culture.

Through the methods I used to interpret the cultural probe kits, I came to the decision to focus on the materials returned in the photography and drawing exercises, which solidified the concept of my final project design. While I had undertaken the research component of the project through participatory methods, I chose to work towards the creation of the final project at this stage independently. Although this meant that the final project itself would be a result of the information gathered through by participatory research, rather than participatory itself, an independent design approach through this part of the creation phase allowed me to more thoroughly investigate how I could visualize affective, qualitative information. Through referring back to the inspirational projects for my research, I was able to begin thinking about the form that this visualization would take. From my initial concept development phase, the final project development occurred in three phases: visualization sketching, initial prototyping and installation development. While I will outline the main aspects of each of these three phases, as this was an iterative process there were times when these phases overlapped, or when I would go back to a previous phase to reconsider design decisions.



(Figure 20. Visualization Sketching Test 1)



(Figure 21. Visualization Sketching Test 2)

The goal of the visualization sketching phase of the project development was to begin moving from the concept to the form. Since I wanted to preserve the physical materials and the images were already digitally scanned, I sketched out my initial ideas primarily using the digital files. While I intended to develop the final visualization through programming, I began by creating video prototypes and still images to gain a clearer idea of how I would develop an application for the final visualization. I initially worked with the whole images, that is, an unedited picture from the photography exercise, or the full sketch from the drawing exercise, to create video collages that used the images to create different scenes (Figure 20). This did not feel particularly cohesive. I moved to editing the images to select portions of the photos and sketches, as is traditionally used

in collage. Using sections of backgrounds and objects from the visual material, I created prototyped still images in Adobe Photoshop and Adobe Illustrator of the types of scenes that could be created with the edited images (*Figure 21*). Through the use of collage I saw an opportunity to delve into the speculative aspect of visualizing spaces of support and empowerment.

Collage has a history within feminist art practice. In *Beyond Fragmentation: Collage as Feminist Strategy in the Arts* (1998), Gwen Raaberg discusses the use of collage by feminists to further political discourse. Beginning with a broader understanding of collage as a method of juxtaposing images in a discontinuous manner. She points to the way it is considered to have changed 20th-century theories and practices in the arts through a countering of modernist tenets of autonomy and unity when Pablo Picasso and Georges Braque turned to it to dismantle traditional realistic representation through Cubist experiments. As the tradition of collage grew, contemporary feminist artists who saw the potential of utilizing both fragmentation and relational strategies to deconstruct cultural representations used collage. By the 1990s feminist artists moved towards collage methods that provided, “a mediating site that suggests new ways of connecting multiple, open identities and perspectives in a multitude of possible relationships,” (p. 169). It is within this tradition that I saw a potential to bring together the images and ideas participants had submitted within the cultural probe kits.

In this case, by combining various aspects of all of the participants’ materials through collage, I was able to see new types of spaces emerge. As I moved toward developing the project through the form of collage, I once again considered projects such as Chris Jordan’s *Running the Numbers: An American Self-Portrait* (2006-current) in which he brings together large numbers of objects to create a cohesive image that tells a story. I saw an opportunity to represent the diversity of these environments through images by using collage to bring together participants’ diverse visions of empowering and supportive environments.

As I discovered through the preliminary sketches using still images, collage provided the opportunity to re-constitute the participant’s images into new imaginative spaces of support. Moving from the sketching phase to prototyping, I was interested in building on the still images using programming. I was particularly interested in how incorporating programming would enable me to explore the multitude of possibilities available through

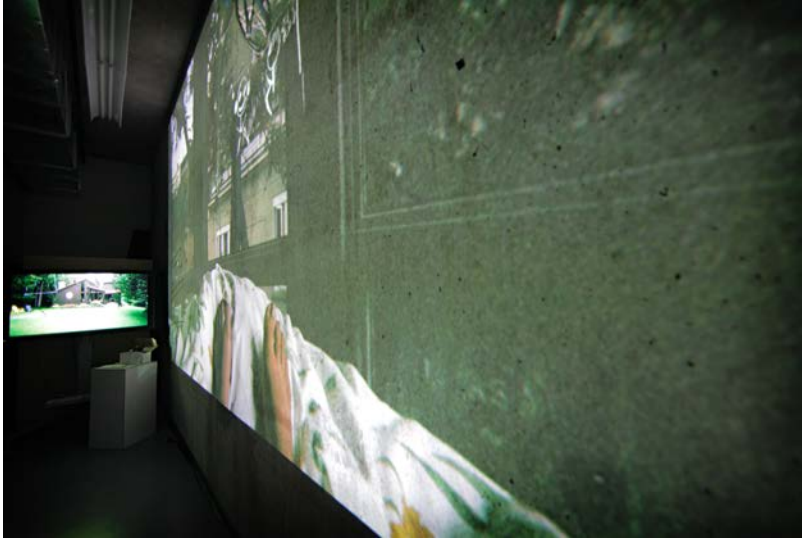
combining participant's materials in a variety of different ways, rather than focusing on singular, static images. Creative coding methods provide unique ways through which to visualize data. Applying algorithms to sort through information provides an opportunity for a different insight than traditional photo or video methods. In this case, I was interested in using the *Javascript* library *p5.js* to develop a prototype that built on my initial sketches. *p5.js* is a software sketchbook that, "... makes coding accessible for artists, designers, educators, and beginners," (*p5.js*, n.d.). It enabled me to explore different visualizations of the images I was investigating. I was particularly interested in using *p5.js* to visualize the various kinds of spaces that could be imagined based on the images submitted by participants. While my initial sketches were put together based on my own choices about what images to put where, I wanted to explore how to generate more diverse scenes bringing together the images in a variety of ways.



(Figure 22. Generative Collages Version 1)

For the first prototype of the final project, I wrote a *Javascript* application in which I imported all of the edited images and designated a foreground, background and individual objects that would appear at the top, middle, bottom, and occasionally on each side of the screen. I differentiated the images in this way to create a more completed scene. With 16 bottom image options, 9 top image options and 99 individual objects, there were a number of possibilities of different scenes that could be created with the program as it selected different images every twelve seconds to create a brand new scene. As I was interested in using *p5.js* to explore the various ways that the images could be compiled to visualize new scenes, developing the program in this way was particularly influenced by the genre of generative art, that is, a method of making wherein the artist or designer produces work through activating a set of rules, particularly a set of rules outlined in a computer system (Boden and Edmons, 2009). By using an algorithm – a set of rules outlined in a computer system – to bring together the different images submitted by

participants I saw the potential to generate a larger number of collages that conveyed a variety of iterations of imaginative spaces of support. Rather than making specific decisions about where each image should go, I saw an opportunity in algorithmically shuffling the images to uncover new relationships between the images. I was particularly interested in how generating the collages in this way would evoke a more dynamic interaction, where viewers might consider why the images are being brought together as they are, and what different interactions between objects might mean. For example, one image that was generated had a background of trees outside a window with a living room placed in front, an outdoor flower basket placed on the table, a candle in front of the couch and a floating sketch of a fluffy carpet, and cushioned couches. Similar iterations of images like these were generated every twelve seconds. As I was working with the form of collage within the genre of generative art, I began using the term generative collages (*Figure 22*). The goal of describing the project this way was to communicate that the collages would be different every time. Whereas a viewer might initially think that they were seeing a video of collages played on loop, pointing to the generative nature of the collages gave insight into the fact that they were being compiled in real time. As I built on the original collage sketches, adding the generative component provided an opportunity to uncover new information about the images and encourage debate and dialogue. Conceptually, creating generative collages, rather than a video loop, also spoke to the intersectional feminist framework that was central to the theoretical underpinnings of the project. As I was particularly interested in creating a space to bring together diverse perspectives, constantly generating new images provided an enhanced opportunity to show the many different possibilities of how spaces of support can be imagined. Building on the use of collage by feminist artists as a method of visualizing multiple perspectives, the generative aspect provided an opportunity to see the many possibilities that arise when diverse perspectives are considered and brought together in different ways.

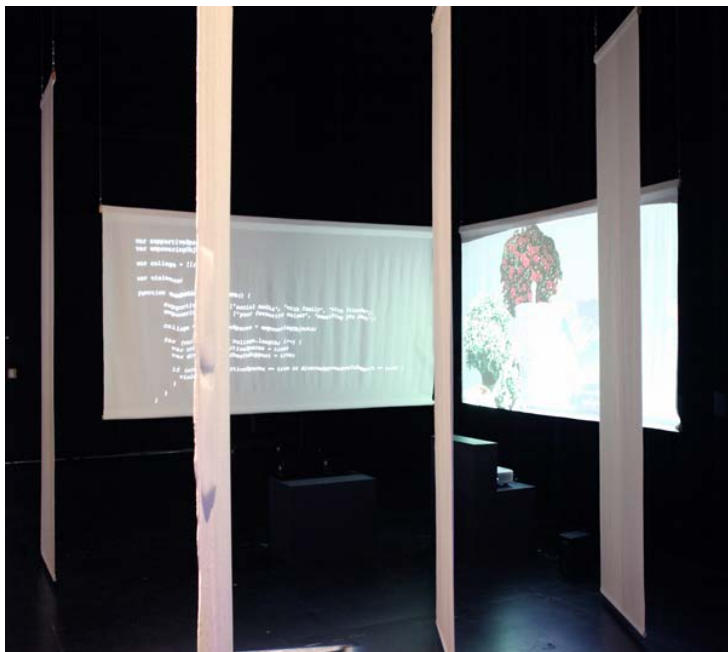


(Figure 23. Installation Test)

Following the initial prototyping of the project application, I began to consider the installation of the project in physical space. As I was investigating how to visualize imaginative spaces of support, I was interested in enhancing the experience of viewing the generative collages by expanding the viewing experience beyond a laptop screen. For my initial exploration into the installation of the project I installed the project in a long and narrow closet in the back of a black box exhibition space (Figure 23). With a short throw projector, I filled the widest wall of the closet with the generative collages. I also brought in a 52" screen where I ran the program simultaneously. The goal of using the closet space was to create a sense of being enclosed. By displaying a large projection of the collages as well as showing them on the LED screen, I worked to create a sense of immersion, or at least a sense of being in the space that was being visualized through the collages. However, while the goal of using the closet space was to create a sense of comfort by being in a smaller enclosure that was separated from the larger exhibition space, it instead seemed to elicit a sense of confinement. As the walls of the closet were concrete, they also elicited a sense of coldness rather than comfort. Additionally, while the initial digital prototype worked to create a dynamic interaction, the collages that were generated were static, making the experience less engaging. I moved back to the prototyping stage to reconsider how to make this experience more dynamic.

Following this first installation test I returned to digital prototyping. I was interested in exploring how to make the generative collages more dynamic through movement. By

adding animation I saw an opportunity to make the images more like a scene and create a greater sense of dialogue between the images and the concepts they represented. For example one participant had drawn a bed with wings, and as mentioned many participants had shared images of nature as empowering. By animating the bed with wings as a floating object that would occasionally interact with baskets of flowers or sketches of the sky these images would gain new meaning. In this case while the bed on its own might represent an interest in both comfort and escape, its interaction with the basket of flowers grounds the image implying not only a desire to escape but also a connection to nature. As such, I reworked the program to animate the images. I first worked with the top and bottom backgrounds, creating a sense of movement by having them zoom in. While animating the backgrounds in this way quickly produced a more interesting image, animating the individual images took more exploration. I worked with a variety of methods of animating the images, also working to limit the images from overlapping with each other. While I explored a variety of methods for the image exploration, I ultimately worked with a perlin noise function to create a smooth movement of the images around the screen. I iterated through a number of possibilities for how the images would move around the screen and the rate at which the images would change. The final digital prototype included a subtle zoom in of the background, and three to five images slowly floating around the screen.



(Figure 24. Final Installation)

After iterating through the digital prototyping, I once again moved into considering the physical installation of the project. As the first installation elicited a sense of restriction and constraint, rather than a comfortable enclosure, I was interested in installing in a more open space. I chose to explore installing the project differently within the same black box exhibition space, in the main exhibition area rather than the back closet. While installing in this space enabled me to create a less restrictive environment, the challenge was to create a sense of comfortable enclosure in the context of the wider exhibition space. As this installation of the project was taking place alongside the installation of six other projects, I was ultimately able to work within some of the space division decisions that were being made as part of the larger exhibition. Specifically, throughout the exhibition 25-foot by 3-foot panels of organic, cotton were hung to divide the space and differentiate the projects from one another. The fabric provided me with the opportunity to create a more enclosed space, and it also served as projection screen material. I created a main projection space with two pieces of 8-foot by 4.5-foot fabric that were hung at the viewer's eye-line. These screens were installed in an L-shape with one set-up as the main screen that the viewer would look at, and the other installed perpendicularly to the viewer's left. To close the rectangular space that began to take shape with the two projector screens, I installed three of the tall panels to the right side of where the viewer would see the main screen. The collages were shown through a short throw projector onto the main projection panel. In addition to the collages, a second projection screen displayed a looping video of pseudocode that aimed to give the viewer insight into the system that was informing the generation of the images.

The pseudocode video oscillated between two screens, the first of which worked to contextualize the subject matter of rape culture. In the code the types of behaviours and ideology that define rape culture are outlined. Following the defining of terms the code outlines that if the behaviours and ideologies are normalized then violence increases.

The code read:

```
var behaviours = [];
```

```
var ideology = [];
```

```
var rapeCulture = [];
```

```
var violence;
```

```

function definingRapeCulture() {
    behaviours = ['street harassment', 'unwanted touching', 'rape'];
    ideology = ['white supremacy', 'colonialism', 'misogyny'];

    rapeCulture = behaviours + ideology;

    for (var i = 0; i < rapeCulture.length; i++) {
        var normalizingBehaviours = true;
        var normalizingIdeologies = true;

        if (normalizingBehaviours == true && normalizingIdeologies == true) {

            violence++;

        }
    }
}

```

Within the video the words in the array (the square brackets) changed to note the different kinds of behaviour and ideology that perpetuate rape culture.

The goal of the second part of the pseudocode video was to show the logic behind the system that informed the generative collages. It outlined that when there are supportive spaces and diverse approaches to support violence can be decreased. This code read:

```

var supportiveSpaces = [];
var empoweringObjects = [];

var collage = [];

function combatingRapeCulture() {
    supportiveSpaces = ['sharing experiences', 'reflection', 'retreat'];

    empoweringObjects = [
        'Something beautiful',
        'Something you like to read',
        'Something that brings you joy',
        'Something comforting',
        'Something empowering',
        'Your favourite time of day',
        'Somewhere you feel safe',
        'Your favourite object',
        'Your favourite colour',
        'Something you want'
    ];

    collage = supportiveSpaces + empoweringObjects;
}

```

```

for (var i = 0; i < collage.length; i++) {
  var creatingSupportiveSpaces = true;
  var diverseApproachesToSupport = true;

      if (creatingSupportiveSpaces == true && diverseApproachesToSupport
          == true) {
          violence--;
        }
      }
}

```

The goal of the second pseudocode screen was to highlight that the images being displayed were those that were gathered from people’s ideas of supportive environments in the context of combating rape culture. While the supportive spaces array showed different words relating to the themes shown in the images, the empowering objects array listed all of the images that participants had been asked to take pictures of.

With the generative collages as the main component of the project, the physical installation and pseudocode worked to foster a sense of space for viewers to further engage with the visualization and its content. Taken together, the project created out of the findings of the cultural probe kits, and the creative exploration of the data was titled *What Do You Need?* Described as a visualization of imaginative spaces of support that used participant submitted visual data, it included sketches and photos, to create generative collages that explore the diversity of ways that people imagine supportive and empowering environments. Each collage, generated one at a time, was comprised of elements from various participants’ submissions. The goal of visualizing the data in this way resulted in images that invited viewers to find connections between objects, space, and the ways different people imagine supportive environments.

Reflections

As an exploration into visualizing affective, qualitative data, I situate *What Do You Need?* as a speculative visualization. The project uses visual representation methods to create thought-provoking work. It provokes the user to consider the diversity of ways that people imagine supportive and empowering environments. Specifically, it encourages the user to think about the diverse ways that people imagine these environments in the

context of combating rape culture. Additionally, it visually represented them through generative collages comprised of participant-submitted materials.

Delving deeper into the use of visual representation to create thought provoking work, *What Do You Need?* specifically explores alternative visions and ideas, which is the cornerstone of speculative design. As the project is based on a questioning of alternative visions for a world without rape culture, the resulting images provide imaginative insight into possible environments: some that are filled with chosen friends and family members in a living room watching television and others that are comprised of local cheeses in a forest. These images might be confusing without the context of the activities that provoked them. Their goal, however, is to encourage the viewer to think about an alternative world in which things are not quite that different, but there is a bit more freedom to enjoy the things that some people are more able than others to enjoy today. With the aim of creating an agonistic space, *What Do You Need?* worked to bring together diverse ideas to foster critical conversations. Specifically, the project brought together different viewpoints about support to provoke viewers to reconsider how they bear witness to people who have shared experiences of sexual violence and harassment. Understanding the importance of the sharing of people's experiences, the project encourages plurality in order to critically re-examine approaches to combating rape culture that require the sharing of a difficult experience, and offers a new approach to the issue. The openness for interpretation of these images also encourages viewers to engage with them over a longer period of time, and consider what the information presented on screen means to them, and what it could mean differently for others.

As a speculative visualization *What Do You Need?* also provided another method for interpreting cultural probe kit data. As I used an algorithm that placed images together at random, I was able to gain new insights into the images returned by participants, because I was able to see new connections that I might not have otherwise made myself. While there was a challenge in preserving the emotional nature of the data, the generative nature of the collages provided a new way to investigate and derive meaning from the images.

To explore the user experience of the visualization of affective, qualitative data through *What Do You Need?* I engaged with viewers during the second physical installation of

the project. While I noticed that many viewers engaged with the piece for a long period of time, I also received feedback about some of the challenges viewers noticed. The biggest challenge that viewers faced when looking at the visualization was a disconnect between the humanity of the data and the display of the data through computation. As the project aimed to bring the human experience to the forefront this was a unique disconnect that is not faced in the same way in traditional forms of data visualization. It seemed that the introduction of the pseudocode contributed this disconnect, taking the viewer out of engaging with the human qualities of the data. Along these same lines, viewers noted that the information was diluted. They were interested in the participatory methods of gathering the data and wanted more information about the individual participants that shared this information and the context around how the information was shared. This feedback from viewers provided an opportunity to reflect on both how the project itself could be modified, and on the broader challenges within the emerging fields of data visualization that aim to visualize non-traditional data that deals with difficult subject matter.

The disconnect that viewers felt between the computational method of exploring the data and the human, or emotional, aspects of the data being visualized, could have been caused by a few factors. One cause for this disconnect might have been the decision to have the computational system randomly choose the images that would be visualized. While I had chosen to have the images that were displayed randomly chosen, as I found it produced interesting insights into the kinds of combinations that the computer would generate, an algorithm that more systematically chose and placed the images might have made things clearer to the viewer. As viewers noted that they needed more information about what they were looking at, they might have been able to more easily discern connections if they were able to identify a pattern through the same types of images always appearing on the same part of the screen. For example, the images could be tagged more specifically such as bed, clouds, trees, rather than just as a background, foreground and image objects. Each object could also be tagged based on the participant who submitted the image, and images could be constituted based on similarities and differences between each participant's submissions. Alternatively, more information could have been provided through retaining a more cohesive picture of each participant by displaying the data based on each person, including their responses to the cultural probe kits. Through displaying all of each participant's responses the viewer may

have a greater understanding of the images as supportive environments and objects in the context of combating rape culture. Finally, this disconnect could have also been due to a missing link between components of the physical installation. As there was little information about the process that led to the visualization of images through the generative collages, it was difficult to understand the context of the imaginative spaces that were being displayed. While the pseudocode aimed to provide insight into what the viewer was seeing, an overview of the cultural probe kits and the interpretation process might have given greater insight about the important human experiences behind the data.

The display of the project as a physical installation, as well as the lack of interactivity might have also contributed to the disconnect that users felt. As the project aimed to engage viewers in discussion about how we can reimagine spaces of support in a digital context, it might have been better suited as a more individual engagement on a laptop or mobile device, such as *The Space We Hold* (2009) interactive documentary. An interactive component could have also provided a greater opportunity for engagement with the project. As one viewer asked about whether people could add their own images, the project might more clearly lend itself to an interactive experience wherein users can contribute directly to imaginative spaces of support.

The challenges outlined here can also be explored in the broader lens of the emerging field of qualitative data visualization. While audiences more easily understand traditional data visualizations as they have likely encountered them before, they are faced with a challenge when it comes to knowing how to read a qualitative data visualization. In the case of *What Do You Need?* which worked to bring together methods such as collage and computation the audience was tasked with interpreting the project on more than one level leading to questions about whether it is collage? Art? Or is it a visualization of qualitative information? As the fields of casual, experiential and speculative visualization provide an opportunity to engage viewers in dialogue and debate by bringing together a number of fields, a further exploration into the best practices for visualizing emotional information could provide greater insight on how to effectively use these methods. Additionally, as participatory design methods lend themselves well to emerging forms of qualitative data visualization more discussion around the practices of interpretation and movement from analysis to development would provide a better framework for engaging

in these practices. These challenges provide an important opportunity for a further exploration into the best practices of visualizing affective, qualitative data. This further exploration could begin using different subject matter as well as investigating opportunities for user engagement.

In addition to engaging with viewers of the project I also had the opportunity to observe a small number of the participants who viewed the final installation. While I did not have the opportunity to observe a large sample, the participants who engaged with the final project were particularly interested in the interactions between their images and the images that other participants had submitted. They were interested in identifying differences between what they had submitted and the other images on the screen, as well as the new meanings their submissions took on in the new context. This interest was generally positive, with a sense that participants were excited about their contributions.

Based on my observations, as well as feedback from participants who expressed gratitude for the opportunity to complete the kits, it was clear that for participants, the project offered a space of support. While this was not necessarily conveyed in the final project installation, the opportunity for participants to reconsider their ideas about combating rape culture, framed in a way that centered support, provided a unique opportunity to engage in conversations about combating sexual violence and harassment. The project also allowed for a diversity of voices, represented specifically through the diversity of ways that participants identified. While the project could have allowed for an even greater diversity of voices, particularly through the opportunity to engage with the final project, the research methods that were used allowed for a more community-focused approach. Finally, while the final installation was difficult to engage with for some, the project provided some insight into a complex issue and contributed to a shifting discourse on rape culture. By showcasing positive images as a method for visualizing data about the diverse ways that people imagine supportive and empowering environments, the project contributed to a re-examining of what is expected in conversations about combating rape culture.

As a speculative visualization *What Do You Need* used a loosely structured algorithm to visualize imaginative spaces of support. The visualization was situated within a physical

installation that worked to enhance the viewer's experience. This form of qualitative data visualization exemplified the potential of visualizing qualitative data to engage viewers over a longer period of time and further explore the unique insights gained through participatory design. While viewers named some challenges in engaging with the different aspects of the project that were on display, the ideas brought forth from this feedback invite a further exploration into qualitative data visualization as sites of dialogue and debate. Based on the lessons gained from *What Do You Need?* I have outlined insights that provide a starting point for a further exploration.

Design Research Insights

- **Participatory design methods lend themselves well to the collection of affective information.** As such, methods for interpreting cultural probe kits should be further explored in the context of visualizing qualitative data. Particular attention should be paid to the move from analysis to the development of the project. This investigation could help to ensure that the emotional nature of the data is successfully communicated through the visualization.
- **There is strength in bringing together different fields such as collage and data visualization to visualize complex information.** The emergence of casual, experiential and speculative visualization has encouraged the use of various creative means to engage viewers in dialogue and debate. However, as viewers are less accustomed to processing data conveyed in these forms, a further investigation should explore the best practices for visualizing information through multidisciplinary methods.
- **Interpreting affective, qualitative data visualization requires a broadening of viewer's expectations.** While traditional data visualizations aim to quickly synthesize information, affective, qualitative data visualizations require the viewer to engage over a longer period of time and actively engage with the information being presented. Greater awareness about the expanding types of data visualizations such as those that require greater viewer engagement could assist with broadening expectations.
- **Visualizing emotional information provides alternative insights into complex issues.** Investigating the issue of combating rape culture through the lens of affective data provided a space to cultivate new visions for a world without rape culture. This investigation could be pushed further in future explorations into

best practices for visualization emotional information to more effectively use these methods.

Conclusion

Spaces that provide an opportunity to find community and build solidarity are essential in the fight against rape culture. The numerous viral hashtags that have been used by people to share their experiences with sexual violence and harassment speak to the benefits of creating these spaces. While the use of viral hashtags have also provided tangible insight into the ways in which rape culture permeates society, we have not always seen these online spaces focus on the issue of support, and in particular, reimagining what a world without rape culture might look like. Within this context an exploration into how to visualize affective, qualitative data provided an opportunity for investigating what spaces of support might look like for those who experience or are working to combat rape culture.

As a reimagining of spaces of support for combating rape culture must include a diversity of viewpoints, using a participatory design methodology provided an opportunity to build a community around the project as participants' submissions became part of the final project. Specifically, cultural probe kits became a space in themselves for participants to reflect on potentially overwhelming information, and consider alternative methods of engagement with the issue of combating rape culture. The creative reflections provided by participants in the cultural probe kits were a catalyst for re-imagining spaces of support.

The emerging fields of qualitative data visualization including experiential, casual and speculative visualization provided a starting point to explore how using visual representations of information can engage viewers in dialogue around an issue. While the final installation of the project faced challenges, namely a disconnect between the computation and a sense of engagement with the data, many viewers did engage with the project for an extended period of time, and were interested in the connections between the images and the participatory methods used to collect them. As such, there is an opportunity for further investigation into how to bridge participatory methods with emerging methods of qualitative data visualization. In particular, this investigation should

explore how to emphasize the individual human experiences reflected in the data. As the ability to communicate emotional data is described in many of the emerging concepts of qualitative data visualization, there is a particular opportunity for further exploration into best practices for illustrating the emotional nature of qualitative data.

As rape culture permeates our daily lives, reflecting on spaces where people feel supported and empowered offers an opportunity to imagine a world without the fear of sexual violence and harassment. As demonstrated through the materials returned by participants when they were asked to reflect on the objects they find empowering and the spaces they wish existed, this world without rape culture can be reimagined in a number of ways. While some of these ideas for alternative spaces can be easily implemented and others might be more difficult, the ability to conceptualize spaces where people feel entirely free from violence and harassment is essential in the work to combat rape culture. Opportunities to visualize these spaces can help foster hope and give society something to strive for as we work to change the culture that perpetuates sexual violence and harassment today. While it can be difficult to engage in this reimagining, from the use of cultural probe kits to exploring the potentials of qualitative data visualization, it was clear at each stage of this research that through creative engagement with complex topics, we can develop bold ideas to change the world around us for the better.

Reference List

- @carabear133. (2016, October 9). @kellyoxford I was 16 and walking in Rome and a grown man went out of his way to try to grab my crotch #notokay [Tweet].
- Boal, A. (1985). *Theater of the oppressed* (C. A. & M.O. Leal McBride, Trans.). New York: Theatre Communications Group. (Original work *Teatro del oprimido y otras poéticas*. New York: Urizen Books, 1979).
- Boden, M. & Edmonds, E. (2009). What is generative art?. *Digital Creativity*, 20. 21-46. 10.1080/14626260902867915.
- Boehner, K., Vertesi, J., Sengers, P., & Dourish, P. (2007). How HCI Interprets the Probes. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1077–1086). New York, NY, USA: ACM. <https://doi.org/10.1145/1240624.1240789>
- Bresler, L. (2006). Toward Connectedness: Aesthetically Based Research. *Studies in Art Education*, 48(1), 52–69. <https://doi.org/10.1080/00393541.2006.11650499>
- Buchwald, E., Fletcher, P. R., & Roth, M. (2005). *Transforming a rape culture*. Minneapolis, Minn: Milkweed Editions.
- Chen, C. (2010). Information visualization. *Wiley Interdisciplinary Reviews: Computational Statistics*, 2(4), 387–403. <https://doi.org/10.1002/wics.89>
- Crenshaw, K. (1991). Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Review*, 43(6), 1241-1299. doi:10.2307/1229039
- Cvetkovich, A. (2003). *An Archive of Feelings: Trauma, Sexuality, and Lesbian Public Cultures*. Durham, NC: Duke University Press.
- DiSalvo, C. (2012). *Adversarial design*. Cambridge, Mass: MIT Press.
- Dunne, A. & Raby, F. (2013). *Speculative everything: design, fiction, and social dreaming*. Cambridge, Mass: The MIT Press.
- Dunne, A., Raby, F. & Anastassiades, M. (2008). *Do you want to replace the existing normal?*. Retrieved from: <http://www.dunneandraby.co.uk/content/projects/75/0>
- FORCE: Upsetting Rape Culture. (2013). *The Monument Quilt*. Retrieved September 7, 2017, from <https://themonumentquilt.org/about/>
- FORCE: Upsetting Rape Culture. (Artist Collective). (2013-Present). *The Monument Quilt*. [Installation]. Retrieved from <https://themonumentquilt.org/view-the-quilt/>.
- Freedman, E. B. (2013). *Redefining rape: sexual violence in the era of suffrage and segregation*. Harvard University Press.

- Graham, C., Rouncefield, M., Gibbs, M., Vetere, F., & Cheverst, K. (2007). How Probes Work. In *Proceedings of the 19th Australasian Conference on Computer-Human Interaction: Entertaining User Interfaces* (pp. 29–37). New York, NY, USA: ACM.
<https://doi.org/10.1145/1324892.1324899>
- Gaver, B., Dunne, T., & Pacenti, E. (1999). Design: Cultural Probes. *Interactions*, 6(1), 21–29.
<https://doi.org/10.1145/291224.291235>
- Gaver, W., Boucher, A., Pennington, S., & Walker, B. (2004). Cultural probes and the value of uncertainty. *Interactions - Funology*, 11(5), pp. 53-56. ISSN 1072-5520
- Hsiung, T., Kang, C., & Lee, P. (2017). *The Space We Hold*. Retrieved from <http://spacewehold.nfb.ca/>
- Hsiung, T., Kang, C., & Lee, P. (Creators). (2017). *The Space We Hold*. [Interactive Documentary]. Retrieved from <https://artscience.ca/work/the-space-we-hold/>.
- Huss, E. (2005). Researching creations: Applying arts-based research to Bedouin women’s drawings. *International Journal of Qualitative Methods*, 4(4), Article 4. Retrieved May 16, 2018 from http://www.ualberta.ca/~iiqm/backissues/4_4/pdf/huss.pdf
- Jenkins, A. & Mazer, J. (2017): #NotOkay: Stories of Sexual Assault in the Midst of the 2016 U.S. Presidential Election, *Qualitative Research Reports in Communication*, DOI: 10.1080/17459435.2017.1404487
- Jordan, C. (2006-current). *Running the Numbers: An American Self-Portrait*. Retrieved from: <http://www.chrisjordan.com/gallery/rtn/#plastic-cups>
- Jordan, C. (Photographer). (2008). *Plastic Cups*. [Photographs]. Retrieved from <http://www.chrisjordan.com/gallery/rtn/#plastic-cups>.
- Kamvar, Sepandar D., & Harris, J. (2011). “We feel fine and searching the emotional web.” *Proceedings of the fourth ACM international conference on Web search and data mining - WSDM '11*. Web.
- Kamvar, S., & Jonathan Harris. (Artist). (2011). *We Feel Fine*. [Experiential Data Visualization]. Retrieved from <http://www.wefeelfine.org/movements.html>.
- Keifer-Boyd, Karen, P. D. (2011). Arts-based Research as Social Justice Activism. *International Review of Qualitative Research*, 4(1), 3–19.
- Keller, J., Mendes, K., & Ringrose, J. (2018) Speaking ‘unspeakable things’: documenting digital feminist responses to rape culture, *Journal of Gender Studies*, 27:1, 22-36, DOI: 10.1080/09589236.2016.1211511
- Khomami, N. (2017, October 20). #MeToo: how a hashtag became a rallying cry

- against sexual harassment. *The Guardian*. Retrieved from <http://www.theguardian.com/world/2017/oct/20/women-worldwide-use-hashtag-metoo-against-sexual-harassment>
- Kim, T., DiSalvo, C., & Jeremijenko, N. (2010). Speculative Visualization: A New Rhetoric for Communicating Public Concerns.
- Klima, J. (Artist). (2001). *The Great Game*. [Video Game]. Retrieved from <http://www.cityarts.com/greatgame/>.
- Kurgan, L., Cadora, E., Reinfurt, D., Williams, S., & Meisterlin, L. (2006). *Million Dollar Blocks Project*. *Spatial Information Design Lab*. Web. <http://c4sr.columbia.edu/projects/million-dollar-blocks>
- Kuhn, S., & Winograd, T. (1996). Participatory Design. *Bringing Design to Software*. New York: Addison-Wesley.
- Lehrer, E., Milton, C. E., & Patterson, M. E. (Eds.). (2011). *Curating Difficult Knowledge: Violent Pasts in Public Places*. Palgrave Macmillan UK.
- Mazza, E. (2017, October 16). #MeToo: Alyssa Milano's Call For Sexual Abuse Victims To Come Forward Goes Viral. Retrieved June 1, 2018, from http://www.huffingtonpost.com/entry/me-too-victims-come-forward_us_59e4271ae4b03a7be5817b3f
- Pousman, Z., Stasko, J., & Mateas, M. 2007. Casual Information Visualization: Depictions of Data in Everyday Life. *IEEE Transactions on Visualization and Computer Graphics* 13, 6 (November 2007), 1145-1152. DOI: <https://doi.org/10.1109/TVCG.2007.70541>
- Raaberg, G. (1998). Beyond Fragmentation: Collage as Feminist Strategy in the Arts. *Mosaic: An Interdisciplinary Critical Journal*, 31(3), 153-171. Retrieved from <http://www.jstor.org.ezproxy.torontopubliclibrary.ca/stable/44029815>
- Roosen, B., Devisch, O., & Martens, S. (Artists). (2013). *The Neighbourhood, Our Garden*. [Installation]. Adapted from from "Visualising things. Perspectives on how to make things public through visualization," by Jessica Schoffelen et al., 2015, October 12, CoDesign, p. 187
- Raley, R. (2009). *Tactical media*. Minneapolis: University of Minnesota Press.
- Steele, J., & Iliinsky, N. (Eds.). (2010). *Beautiful Visualization*. Sebastopol, CA: O'Reilly.
- Schoffelen, J., Claes, S., LHuybrechts, L., Martens, S.,

Chua, A., & Van de Moere, A. (2015) Visualising things. Perspectives on how to make things public through visualisation, *CoDesign*, 11:3-4, 179-192, DOI: 10.1080/15710882.2015.1081240

TallBear, K. (2014). Standing With and Speaking as Faith: A Feminist-Indigenous Approach to Inquiry. *Journal of Research Practice*, 10(2), 1–7.

Wattenberg, M., Walczak, M., Feinberg, J., Solomon, R., & Kindvall, J. (2007, 2008). *Noplace*. Retrieved October 11, 2017, from <http://www.bewitched.com/noplace.html>

Wattenberg, M., Walczak, M., Feinberg, J., Solomon, R., & Kindvall, J. (Artists). (2007-2008). *Noplace*. [Installation]. Retrieved from <http://www.bewitched.com/noplace.html>.

Weiss, S. (2014, May 26). The Power of #YesAllWomen. *The New Yorker*. Retrieved from <https://www.newyorker.com/culture/culture-desk/the-power-of-yesallwomen>

Zaleski, K. L., Gundersen, K. K., Baes, J., Estupinian, E., & Vergara, A. (2016). Exploring rape culture in social media forums. *Computers In Human Behavior*, 63922-927. DOI:10.1016/j.chb.2016.06.036