

MEDIATING DIFFERENCE THROUGH
COMMUNITY-BASED DESIGN IN URBAN
CONTEXTS

A Dissertation

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MEDIATING DIFFERENCE THROUGH COMMUNITY-BASED DESIGN IN
URBAN CONTEXTS

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Difference is a fundamental aspect of human life, especially within mixed urban communities where people are differentiated by age, ethnicity, religion, standards of living, organizational affiliations, and cultural traditions. This raises the question of how such communities can shape the future of their shared environments in more just ways, given that each individual or societal group holds a different claim for what it means to have a good life. My dissertation, spanning three years of participatory design fieldwork in New York City, investigates how design researchers can engage communities with and through design to better mediate difference in urban contexts. It further examines how difference in turn can help us rethink how we imagine and do design itself.

I approach these questions through situated pedagogical design programs that offer socio-spatial contexts for ethnographic observations and participation. I show how design can support mediating difference in such contexts through three projects, each involving a different constellation of community groups from NYC. I also identify three stances to approaching difference from democratic and care techno-science theories and interpret each project through one of the stances. The first stance, called public deliberations, tries to resolve difference through deliberations that ultimately work towards the majority claim. The second stance, which I term pluralistic care, advocates

bringing pieces of difference into the public realm, and attuning to them with curiosity, dialogical skills, and care. The third stance, called agonism, calls for creating spaces of conflict that do not shy away from difference and making disfranchised claims visible.

The dissertation fieldwork reveals that public deliberations largely work to surface common claims, but do not necessarily create rapport around difference and minoritized claims. The pluralistic care stance can bring us closer to a state of equilibrium around difference but it entails relational work that might leave little or no time for other design goals such as producing material artefacts. The agonism stance has a strong potential to reveal invisibilized claims that the other two stances may not reveal. It is however socially and emotionally risky, which requires more research on the supervisory roles designers should play in such contexts and the modes and moves of conflict that break, rather than extend and deepen, the nature of design and difference encounters. The choice of one approach over another ultimately depends on the goal of the design context, the desired affordances, and the social justice considerations in place. I conclude by reflecting on the affordances and limitations of an interventionist ethnographic approach to design and critical theory, and suggest new research trajectories in design around unmaking.

BIOGRAPHICAL SKETCH

Samar Sabie was born in Baghdad, Iraq. By the age of eighteen, she and her immediate family had already lived in four different countries. Each country move, while an exciting chance to be in a new commune, meant working hard to observe and participate in different contexts, adapt to foreign customs and educational systems, and design objects and spaces that made the unfamiliar surroundings feel like home. Little did Samar know that these childhood and adolescent experiences would seed in her a passion to be out in community contexts, observe their social and environmental contours of existence, and contribute to what she sees through design, ethnography, and critical theory.

Samar earned her undergraduate degree from the University of Toronto with a double major in Architecture and Computer Science. At the same institution, she completed a professional Master of Architecture degree, writing a dissertation on designing long-term refugee camps in the Middle East which won the Irving Grossman Best Thesis Award. Samar also pursued a research-based Master of Science degree in Computer Science, during which she studied the conditions of over 5000 shelter units in refugee and Internally Displaced Persons (IDP) camps in Iraq. In this work, she developed a vision through which low-tech interfaces can be used to support participatory design and sketching of dream shelters while visualization and modelling algorithms on the back-end produced structurally optimized versions of the designs. This research remains one of very few in the area of architecture, Human Computer Science (HCI), and participatory design.

At the time of writing this dissertation, Samar was an Information Science PhD candidate at Cornell Tech / Cornell University. Her research examines how design as a socio-material practice can support communities in re-imagining

and/or re-configuring their urban contexts in more equitable ways in the presence of cultural, generational, and political differences. Her approach is highly interdisciplinary, combining design and making with ethnography, critical theory, and pedagogy development in community-based contexts. Samar's research has been published in top-tier Human-Computer Interaction (HCI) venues, won best and honorable mention paper awards, and has been supported by the Social Sciences and Humanities Research Council of Canada (SSHRC) and Cornell diversity and community engagement grants. Samar completed her PhD in August 2022. She is returning to the University of Toronto as a post doctoral fellow in Computer Science (2022-2023) before starting in July 2023 as an Assistant Professor at the Institute for Culture, Communication, Information, and Technology (ICCIT) with a graduate appointment at the Daniels Faculty of Architecture, Design, and Landscape.

To my parents, Dr. Maha Salman and Dr. Khalid Sabie
To my sublings, Dina Sabie and Ahmed Sabie
To every Muslim sister out there holding strong to her faith
Peace be upon you all

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a big fan of your work and it never occurred to me that I would have the honor of you being my committee and STS minor member. I will forever be in debt to you not only because of your support and calm, grounding wisdom, but also because you taught me *how to read philosophy*. The reading groups you invited me to and made possible despite my remoteness from Ithaca have opened new worlds to me. The one-on-one reading sessions we set up for the dissertation theory block has shaped my identity as a female Muslim scholar and gave me a road map for how I want to read and teach critical theory. Thank you for the generous time and effort you have (while being our department chair) taken to read my (very) long notes, discuss each and every book and article, and inspire the dissertation framework.

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CHAPTER 1

INTRODUCTION

By higher academia's mandates, this dissertation is a scholarly endeavour to make a significant contribution to knowledge around design and difference in urban contexts. This includes how design creates contexts to surface and work across difference, how people react to and navigate the emerging differences, and what the findings and limitations tell us in return about human nature and design as a socio-technical practice. In reality, the tens of thousands of words spilled here are just a shot (my best one) at approximating three years of life lived and doctoral research conducted at a unique context composed of a new Ivy League campus, a small residential island, a city "on steroids", and many, many community members.

Prior to starting a PhD in information science at Cornell, I was trained in architecture and computer science at the University of Toronto. I had gotten involved in research early on in my undergraduate training and my research trajectory went through three phases. It started with Ubiquitous Computing on the architecture side, so my focus was on developing sensing and actuating technologies for building components. I then moved to Information and Communication Technology for Development (ICTD) where I was studying both shelter conditions and technology use in camps for refugees and internally displaced persons in Iraq. My research shifted one more time shortly after starting the PhD to focus on Community-based Participatory Design in New York City. Throughout this 3-phase research journey, I have worn many hats and worked with different research methods and disciplines. But while I have always been an academic who thinks through and with design, it was only

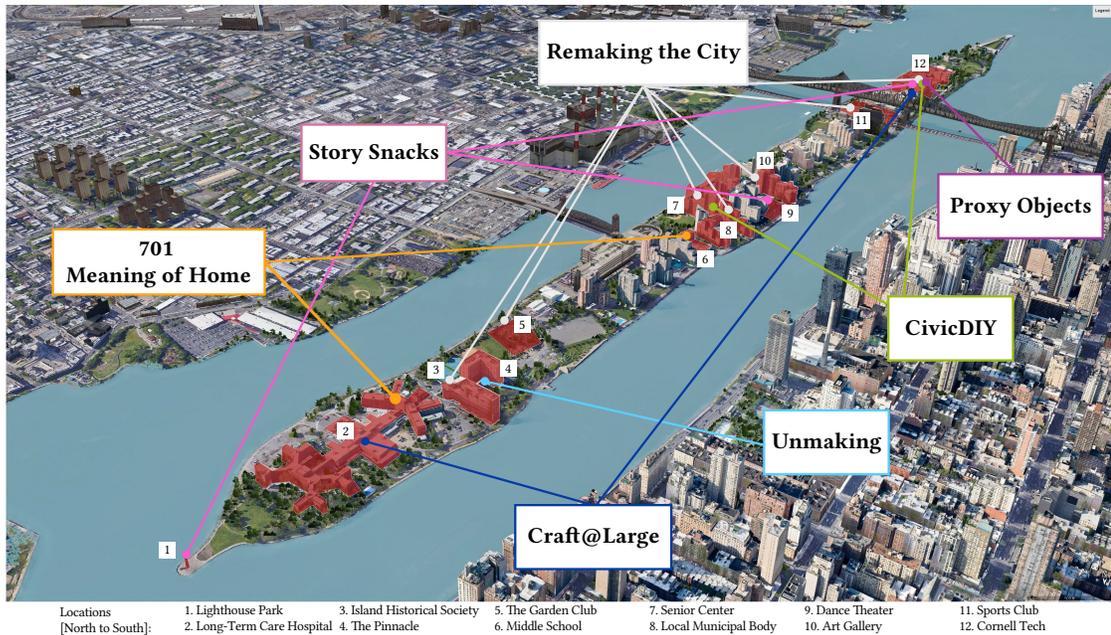


Figure 1.1: Fieldwork Locations on Roosevelt Island

through this doctoral work that my two passions, design and communities, came together.

The word "design" is used ubiquitously these days without having a universal definition. Some fields approach design as an action-based science that can be empirically measured and reproduced [326]. Some fields see it as an argument-based art or rhetoric [47]. Yet others view it more generally as the social mediation of human actions to shape the environment [360]. In essence, there is no one definition for design and it certainly means a different thing in each research area I have been part of. In architecture, one of the longest established design fields, I was trained to approach design as a professional mandate committed to producing spaces, systems, and artifacts that provide structural rigidity, commodity (meaning they are practical and usable), as well as delight (in the way designed things look, sound, and feel) [314, 277].

While architecture was traditionally built without architects, this practice is no longer common in developed urban contexts for a wide range of reasons including construction monopolies, onerous building code requirements, and complicated legalities - all which keep the process tightly regimented and in the hands of professionals.¹ This notion of design as a fixed, rigid, expert-driven mandate was however challenged by my ICTD experience of the contingent and socially constructed spaces in camps where design happened in far more expansive ways and by a wider set of actors who were mostly non-designers by profession using local materials and motifs to shape their environments [298, 295]. My work in camps made me reflect on my own positionality in the design process and how I could support community-driven orchestrations in more involved and situated ways where I am not on the field for only a few days at a time. It was with this pondering, community-engagement seeking spirit that I started the PhD at Cornell Tech.

When I arrived to Cornell Tech in August 2017, the graduate campus had just opened on Roosevelt Island, NYC with the goal of establishing a tech innovation hub on the East Coast that would also have lasting societal impact. From the very beginning, there was a strong institutional commitment (a commitment earnestly reflected in our research lab work) to public engagement through tech initiatives especially in the context of our immediate community: Roosevelt Island (Figure 1.1). The island is home to 15,000 residents who come from a wide range of nationalities and socio-economic brackets. In addition to luxury residential developments on the island, there are affordable housing units (although gentrification is changing that), public schools, shops, restaurants,

¹The focus on expert knowledge is reflected in the elaborate training requirements to obtain an architectural license in North America, which includes graduate-level training, multiple exams, and 3720 hours of practical experience in 15 categories that include construction, legal work, and management

parks, and a long-term care public hospital. In this scholarly and socially rich context, I did 3 years of design and participatory design field work (2017 - 2020) with a wide range of community members on the island. These participants/community members also happened to be my neighbors as I lived on campus.

Shifting from ICTD to "design for here" happened six months after I started the PhD, and was seeded by the sheer exhaustion of doing research in a context so dangerous and far away. It was also galvanized by the community-based research my advisor was establishing at Cornell Tech. Through this shift, my thinking with and through design evolved from focusing purely on structures, places, and objects to foregrounding the people, a lot of people including: civic organizations in the vicinity of campus, independent artists and activists based on Roosevelt Island, Cornell Tech students, older adults who live on the island, and youth enrolled in the island school among other community groups.

1.1 Research Questions

During the course of my PhD, I worked with Roosevelt Island community members and groups through several projects. Each project had its own research questions, goals, and design methods (more on that in sections 1.2 and A) and not all were explicitly around difference. But regardless of the project, whether I was observing, doing user interviews, or analyzing data, I found myself always sensitized to and interested in difference: What difference am I seeing in this context? Is it causing tension? Whose identity/difference is marked and whose is unmarked? Who has the upper hand? Whose needs were fulfilled by the socio-spatial context they are in and whose are not? How are the

people involved dealing with it? What does that say about the society we live in at large? And how do we dissolve certain norms to better accommodate certain differences?

Akin to design, difference has many definitions. The Stanford Encyclopedia of Philosophy states that difference is "an empirical relation" between two things where "each has a prior identity of its own", such that "x is different from y" [328]. In my work, I approach difference from an urban and sociological diversity angle that does not deem a population an autonomous mass. Rather, it acknowledges that an urban population is *deeply* differentiated by criteria of age, class, occupation, dis/ability, ethnicity, culture and religion. Each individual and societal group could therefore hold different visions and claims for what it means to have a full life in the city. These differences go to the heart of fundamental propositions and values - the nature of virtue, what counts as good and bad action, the nature of the good life, etc. Difference in this research is not epiphenomenal - a colorful gloss on what is an essentially unified human nature - but emanates to the foundation of identity, value constitution, and the hard and uncertain work of collaborating, living together, coexisting, etc.

My interest in difference is specifically within the expansive sphere of urban difference and diversity, around "everyday people in everyday spaces" (so not grandiose moments such as presidential elections for example), and how we can seek, mediate, or expunge "intersecting axes of difference" [101]. This interest might have stemmed from the diversity of NYC, where I lived for 3 years of my PhD, as difference there is one of the most obvious, overwhelming, yet fascinating aspects one notices when navigating the city's social fabric. It could also be that being different (e.g. I am different from the campus

academic community by being a practising Muslim and wearing a headscarf) was my reality so it subconsciously fed into the research. Regardless of the reason, difference is and has always been real: even a small community conglomeration made up of five youth and nine older adults would still be riven by a multiplicity of differences including age, gender, ethnicity, religion, standards of living, organizational affiliations, and cultural traditions among others. If we want our societies to be more just, we must learn to approach our differences and design shared futures together.

After 18 months of fieldwork, one question for the dissertation started to emerge and later evolved into: *How can design researchers engage communities with and through design to better mediate difference in urban contexts?* In other words, how would we use design, not necessarily to make yet more commodities, but as an epistemic tool for communication across difference? A second research question emerged after diving into democracy and design theories post fieldwork and data analysis, which is: *how does difference help us in turn rethink how we imagine and do design itself?* In the next sections, I describe how the dissertation is organized to respond to these two questions.

1.2 Mediating Difference through Design: Theory & Empirics

I led or co-led seven community-based design research projects on Roosevelt Island during my doctorate (Figure 1.1). Four of the projects: Meaning of Home (Fall 2017 - Spring 2019), Remaking the City (Fall 2017 - present), CivicDIY (Summer 2018), and Unmaking (Summer 2018 - present), have their dedicated dissertation chapters and I will introduce them in more details later in this

section. The remaining three (Story Snacks, Proxy Objects, and Craft@Large) are shorter, artefact-based projects that I performed as auxiliary explorations based on findings or unaddressed insights arising from the primary empirical work. Since these projects are mentioned in the introduction (sparsely, for example as contexts where I worked with some participants), I included their details in appendix A.

Through these projects, I developed a set of questions and dove into a program of reading into political philosophy, which has thought in a longer and more careful way about mediating differentiated subjects in a society more than design has to date. Where theorists of the 1980s and 1990s (many following the lead of Jurgen Habermas) emphasized the ideal deliberative character of democratic engagement (see inter alia [144], [280], and [65]), later theorists (like [241], [384], [67], and [160]) came to engage more directly with the problem of difference - and how this difference could be accommodated under and mediated through the mechanisms of democracy and collective decision making. This later work shows that in democracy, including that which is built on liberal ethos and majority vote, only a subset of interests could win or advance. The losing sides have to accordingly submit to the winning interests and orders. Political philosophers describe this dynamic as "legitimate coercion" [213]. Coercion is necessary for the well-being of the collectivity (hence the legitimate part) and examples of it include taxation, gun ownership restrictions, and speed limits. But coercion does mean that our justice is never really complete, because there will always be needs that are compromised and suppressed by the dominant rule (hence the coercion part). No system ordering a society, especially a mixed one, could therefore ever be at an end state.

Design across many disciplines has long been invested in helping citizens surface and advocate for the different needs and interests that exist in a society but may not be supported by its hegemonic orders. This design investment is paralleled by the recent developments in democratic theory mentioned above, where democratic procedures seeking transcendence over difference through universal consensus are countered by others embracing conflict and multiple modes of articulation [144, 237, 30]. Building on these theories, as well as feminist techno-science (which is committed to ethically engaging with difference) [274], I have identified three stances to approaching difference in urban contexts that can be activated through design. Chapter 2 will cover these approaches in detail including how some of them have been interpreted in the design and Human Computer Interaction (HCI) literature. Chapters 3 to 5 will each synthesize and develop one of the stances in light of empirical field work. Below, I briefly introduce the three stances and their associated projects.²

1.2.1 Public Deliberations & Meaning of Home

The first stance, which I identify as *Public Deliberations*, draws on theories of deliberative democracy by Habermas and his interpreters [144, 376, 213]. Philosopher Jurgen Habermas states in his 1981 theory for communicative action that we need to take up different issues and arguments in public arenas in order to move beyond private interests and form common convictions through free and equal communication [144, 143]. The deliberations Habermas envisions

²I did not start reading theory and deriving stances until after most of the fieldwork was complete, so my characterization of the three approaches to difference was inductive rather than deductive. The fieldwork however spanned the spectrum of the three with a one-to-one correlation between the stances and projects. I believe it was a combination of luck, the fieldwork guiding my classification of theory, and because the three stances are common ways to approach difference so we organically leveraged them or they emerged on their own.

require open mindedness and a comprehensive degree of consensus among the public achieved under equalizing power conditions [384]. As Mansbridge notes, for Habermas, "the only legitimate power arises among those who form common convictions in communication free from coercion" [213]. Such ideal vision of deliberations is however tricky to achieve because is a level power field ever possible? Further, a high degree of consensus ultimately shuns the pluralism inherent to the society in deliberation [30, 213, 238]. Later deliberative theories from the 1990s therefore set deliberation as a central process for authentic decision-making but they acknowledge that difference and power permeate them [384, 376, 213].

Building on these later theories, the first stance I identify in this dissertation for approaching the political calls for approaching difference by identifying and enjoying moments of commonalities across a diverse society as it deliberates the good of the collectivity. The goal of this stance is majority based census, but the process of getting there can be used to surface conversations about the differences that exist in that society and build rapport around them.

Deliberation-based processes are familiar and common, but less so are those meeting the specific Habermasean standards of checking power at the door and arriving at consensus on basis of deliberative public debate. Chapter 3 "tests" public deliberation as a model for mediating difference using design in a community context through the Meaning of Home project my advisor and I ran at the Roosevelt Island public school. The school demographic, a reflection of the island population, is very diverse and encompasses many immigrant and expat students. The student body is not only ethnically diverse, but also transient given that many international students enroll or leave at

any point during the semester due to their guardians shifting work missions (Roosevelt Island is home to many UN diplomats). With the school social studies teacher, we sought pathways for his seventh and eighth graders to engage with the multitude of ethnic, religious, and language differences present among them and engender a sense of rapport. Our approach was to design and teach a thirteen week social studies unit at the school around oral histories collected from the island. The practice of collecting oral history interviews has been shown in the education literature to engender relationality between the interviewer and interviewee and help adolescents see multiple perspectives around the same topic [257, 46, 373]. One limitation with oral histories though is that they generate a lot of nuanced data that can be hard to share as is – so we approached processing such qualitative data as an opportunity for deliberations and commonality finding. We had students interview each other, their guardians, as well as community members about the meaning of home, a topic relevant to everyone, in reference to both their past and present contexts. We then worked with students to process the collected interviews using open coding and computational analysis, performing the latter through a word frequency analysis tool we built called WHiGC [312]. We spent multiple classes doing the analyses in collaborative and deliberative ways. An example includes deliberating how to consolidate differing codes on the same transcript excerpts. Our final goal was to identify frequent themes in the oral histories and establish a common narrative of what home means to the island.

During the run of the unit, we were able to enjoy moments of commonality such as when the entire class saw their interview codes converging on similar categories, or when students did the final presentations and repeatedly reported that whether one grew up in Dhaka, Bangladesh or Brooklyn, NY, home meant

the same thing to them: being with family, making memories with friends, relaxing in nature, and working hard to obtain education. The moments of commonality in this project were countered by moments when we as the research team had to carefully attune to difference - for example when I was listening to and transcribing the oral histories students collected so that we have text transcripts to use in class. That is when and where I heard the individual, minoritized and outlier stories that did not make it into the common narrative. As detailed in chapter 3, perhaps because those narratives were missing, a commonality-oriented process despite its deliberative nature has a limitation in that it does not engender enough rapport across difference. Another Meaning of Home limitation I reflect on in chapter 3 is that we can often find ways to flatten the data so that it tells a story of consensus because many design tools and approaches (including the ones we used) are really good at defying difference and giving us a common narrative to celebrate. So design is to some extent already optimized for identifying similarities across difference and supporting this first stance towards difference. How then do we really engage with the life experiences and practices of others when they are different from ours? This question brings us to the second stance I explore in this dissertation: pluralistic care.

1.2.2 Pluralistic Care & Remaking the City

In the second stance, I draw on political philosophy [160, 67], urban sociology [320], as well as the work of care scholars such as Annemarie Mol and Puig de la Bellacasa [234, 274]. The idea in this stance is to approach difference by bringing pieces of pluralism into the public realm, along with curiosity, dialogical skills,

and making time for *care*. Care, as Puig de la Bellacasa argues, is an "essential character" to humans and other living beings but is ontologically ambivalent: it could be "affection", "moral obligation", "burden", or "joy" or all of these things together [275]. The literature has a wealth of care studies in contexts such as research and making practices, policy making, and in considering more than human worlds [348, 387, 377]. Care has (consciously and subconsciously) permeated the bulk of my PhD work on difference, including how to carefully listen to difference (e.g. Story Snacks), prototype it while respecting religious values (Proxy Objects), seek justice for it through socio-material assemblies (Craft@Large), and attune to it through reciprocal relationships (as emerged in Remaking the City).

Chapter 4 will delve into Remaking the City, an ICT service-learning course that partners Cornell Tech students with island community organizations to co-design technologies for improving their operations. My advisor developed and taught Remaking while I served as the teaching assistant and field researcher. In the course, we were faced from the beginning with organizational differences around outcome priorities and timelines. In general, university ICT programs are invested in novel artefacts, CV enhancing experiences, and a high throughput of outcomes. The partnering community organizations on the other hand often prioritize reliable, even mundane tools that work for them over technical innovations that would never get done within the semester timeline, and might not be sustained by less technically proficient community organizations once the supportive structure of the intervention was removed. If we do not carefully tend to these differences, what could end up happening is that students gain service experience and test novel ideas with the community but community partners receive no tangible benefits in return [66, 288]. In our

case, difference also stemmed from the fact that we and the students were new neighbors on the island, so there were no relationships established with the community partners and each of us viewed the other as a stranger.

Usually, to facilitate a community-centered process with students, we tend to set very clear requirements and expectations. Here we did the opposite of that: we deliberately and strategically introduced ambiguity in the curriculum – for example by asking students to commit up to five hours per week to support their partner’s technology needs but not prescribing how. As detailed in chapter 4, students quickly discovered that they can only navigate this ambiguity by interacting often with their community partners to scope and co-navigate the service projects. These frequent interactions led to both sides getting to know each other well and to enact various practices of care. From the student side, that included leaving behind the innovation-centric mindset to really center the priorities of their partners which included fixing legacy software platforms, prototyping tech literacy paper cards for older adults, and migrating web hosting services. In return, the community showed care by inviting students to dinners and festivals, giving them gifts and hugs, and asking them caring questions like “are you eating enough?”, “do you miss your family?”, and “aren’t you working too hard?” [300]. The students truly appreciated these gestures since most of them were away from their families.

Of course this does not mean that approaching difference with care was easy or tension-free. Many students reported feeling a sense of anxiety and discomfort, especially at the beginning around approaching ambiguity, which was unfamiliar compared to their other ICT courses. The same applies to partners who were not sure if their time investment would pay off.

Additionally, the time students and partners spent interacting with each other was time not spent on coding, user studies, perfecting elevator pitches, or doing "real" work. None of the service projects were novel or innovative from a technical perspective. And some students felt that such relational outcomes could not be transferred to their CVs and portfolios - more on that in chapter 4. Now if ambiguity and care entailed some discomforts and tensions during the process, what if we design for the discomfort that comes with difference in the first place? This brings us to the third and last stance explored in this dissertation: agonism.

1.2.3 Agonism & CivicDIY

In this stance, I draw on the work of political scientist Chantal Mouffe [241, 237] and others [67, 160] who theorize *agonism* as a stance for creating permanent spaces that surface conflict, make visible disenfranchised needs and contest hegemonic practices. Conflicts and contestations are very much a part of life, but we rarely see social contexts for them through design. Researchers and designers have taken up agonism in design [82, 36, 183]. In the existing work, the confrontations across difference are *envisioned* to happen rather than actually happen, or if they do happen, they are highly conditioned to ensure that disagreement remain *constructive* [112]. But what if we just let agonism happen - on its own ground, on its own terms, untamed by social conventions or design imperatives?

I shed insights on this question in chapter 5 through the ethnographic account of CivicDIY, or the Civic Design Internship for Youth, a six-week

summer program I led in 2018 for a group of youth who live and attend the middle school on the island. Those are some of the same youth who had gathered oral histories from island residents during the Meaning of Home project. Our goal with CivicDIY was to come up with design interventions to address a ubiquitous need that emerged in the oral histories around increasing civic engagement and social cohesion on the island. During the six weeks, we engaged the youth in design thinking exercises, took them to design events on our campus, gathered more site and user data, and synthesized the information as a group. We also did prototyping, desk critics, and group pinups, and repeated these cycles a few times until the youth refined their ideas. The youth eventually converged on the following proposals: a VR zoo, spa kingdom, BMX park, sightseeing river train, cultural center, floating shopping mall, and destroying the Pinnacle.

We took the youth to present their final proposals at the island senior center to get pluralistic feedback on the ideas and forward them to the island governing body for consideration. The reaction of the older adults, much like ours, was along the lines: *how is that civic design?* Through reflections and data analysis, I found that the answer lies in the layers of agonism inscribed in how the youth finally got to these proposals. One layer included the youth recasting what civic means, which for them includes fun, loud, intergenerational socializing. Another layer of agonism is found in the proposal to destroy the Pinnacle. The Pinnacle is an alias for a luxury condominium on the island that has historical significance. My advisor and one of the youth lived there at the time of CivicDIY, and one of the older adults had her office there. Some of the youth persistently proposed destroying the Pinnacle without any replacement as part of their design deliverables for CivicDIY. This *unmaking*

proposal - which took everyone in the program by surprise - did the work of agonism in multiple ways as I describe further in chapter 5. As a research team, it put us in conflict with the youth. It made us keep asking them: where is your design? Why do you want to destroy the Pinnacle? What about the people who live there? Is this appropriate? Can you give us a real design? At the senior center, it generated the most conflict with the youth and older adults passionately discussing and disagreeing about the blunt loss it entailed and the youth audacity to even suggest it. In post CivicDIY interviews and focus groups with the youth, it led to important revelations: the youth disliked the Pinnacle's "exclusive" and "rich" image as it foregrounded the financial burden many felt due to increasing gentrification on the island and many of the youth friends and classmates "disappearing" from their school and move elsewhere. So in a way, the youth were using this proposal as a tool to contest increasing social disparity in their community through design. That of course meets the mandates of agonism around engaging in contestations.

In chapter 5, I go into further details about the agonistic potential of this unmaking by comparing it with other CivicDIY proposals such as the spa kingdom (which entailed unmaking what existed on their sites but was not as conflictual) and the VR zoo proposal which everyone loved (it was a zoo but its youth designer decided to augment it on the fly during the final presentations to also be a cultural center for older adults).

Unlike Meaning of Home and Remaking where we knew before starting the projects what kind of differences we might face, difference in CivicDIY was emergent and ended up being about diverging intergenerational urban priorities and what civic means in the first place. Further, unmaking, which

emerged organically in this project revealed the increasing social disparity in what was historically a mixed-income community. It raised discussions and passionate disagreements in ways that the other proposals did not. It showed that not all problems can have a satisfy-all solution. And it helped us critically think about how we design in terms of making and unmaking. But I also conclude in chapter 5 that agonism and unmaking are not a global solution because each of them entails a range of complications. For example, conflict is hard emotional labor because humans are conditioned in their daily social performances to optimize for consensus so engaging with agonism (and unmaking which is often conflictual) might require emotional preparation and recovery. Further, we must acknowledge that discomfort or potential violence arising from agonism and unmaking can afflict some participants (such as marginalized groups) more than others. Lastly, agonism as an approach to difference and unmaking as an approach to design are under-explored so there is a lot of ambiguity in terms of how we can approach them in practice and we need requires more research from an interdisciplinary lens.

1.2.4 Unmaking

CivicDIY opened my eyes to the fact that some things in the world - objects, systems, norms - have to be unmade to face or advance certain claims over others. This might happen in spite of objections and attachments and on things not owned by the unmakers. In that case, unmaking is an epitome of difference because it signals that no solution is possible so a fractious dissolution is the only way out or forward. CivicDIY further galvanized discussions with others about how architecture, computer science, and information science

are focused on making, innovation, progress, novelty, and development even though unmaking haunts many aspects of their operations such as making room for new buildings or products, extracting resources, and demoting certain knowledge frameworks. More is therefore needed on unmaking in design.

Having shown in chapter 5 how unmaking diverges from making as well as its potential for provocation and agonism, I revisit unmaking (and CivicDIY) in chapter 6 to show it can advance the existing design discourse on unmaking in three ways. First, I highlight how design is increasingly paying attention to unmaking through multiple typologies. I then argue that the current scholarship does not sufficiently tend to the objections, politics, and harms associated with unmaking though, which is why three new trajectories are needed: rejudging the boundary around the actors and sides considered, grappling with inevitable tensions, and rethinking progress by acknowledging the loss and pain unmaking might inflict.

1.3 Research Methodology

This dissertation is methodologically based on what I term *Situated Learning Interventions with DDesign* (SLIDE). I see SLIDEs as deliberate, thoughtfully developed educational contexts for learning and thinking with design in its varying capacities and definitions. SLIDEs foreground and revolve around the participants' situational conditions (e.g. social, environmental, technological) including in the interventions produced. They are pedagogical, making use of educational practices such as lectures, evaluation metrics, and passing grades to create purpose and sustained engagement. They are interventions by (1)

focusing on designing material things and (2) creating socio-spatial contexts for observation and participation. Lastly, their design core spans strategies, tools, and modes of thinking and interventions from multiple fields. Despite their pedagogical nature, SLIDEs are not motivated by a deficit or transmission model. Rather, they are *co-design*, *co-learning*, and *co-production* sites.

SLIDEs draw on existing research approaches from multiple disciplines including ethnography, Youth Participatory Action Research (YPAR), Social Design Based Experiments (SDBEs), Participatory Design (PD), and HCI/design events. But an SLIDE is not precisely or wholly one of them, hence the need for the term. Below, I provide an overview these relevant research approaches including their relations to four dimensions: situated, pedagogical, design-based, and interventionist. I then articulate how these dimensions crystallize and what they afford in the context of this dissertation. The overview starts with ethnography - a practice that is leveraged with varying degrees in all of the relevant approaches:

Ethnography is both the practice and outcome of studying and gaining knowledge about a social group [165]. Many social science fields today leverage this approach, and it has been incorporated into design and HCI practices as early as the 1980s [39]. Despite the different flavors of ethnography practiced today across disciplines and its ever evolving nature, Blomberg et al. [39] identify four principles underpinning ethnography. First, it is conducted firsthand in a "natural setting". Second, what is observed must be "holistically" investigated within a web of other activities and connections rather than seen in vacuum. Third, the primary goal of ethnography is to understand and describe (rather than prescribe) the events occurring.³ Lastly, ethnography attempts to

³Many recent conversations in both ethnography studies and design research [151, 159]

see and "classify" the world from the view point of the participants rather than through a priori categories. In design and HCI praxes, the classic traditions of prolonged and participatory observations of ethnography (inherited from anthropology) have been augmented with more "constrained" modes such as focusing purely on interviews and qualitative coding, spending just a few days or hours with participants, and maintaining a fairly detached "observer" role [39]. This does not mean that our field does not boast a wealth of design and design research works imbued with deeper, longer, and more embedded and participatory forms of ethnography [195, 283, 387, 195]. The primary dimension of ethnography that informs my research (and SLIDEs in return) is its situatedness.

Youth Participatory Action Research (YPAR) is a praxis that supports youth in examining the "social problems affecting their lives and then determine actions to rectify these problems" [55]. YPAR is steeped in resistance and social justice work, and seeks "justice of recognition" that leads to systemic and institutional transformation [54, 76, 103, 105]. Some YPAR outcomes include "policy briefs, engaged sticker campaigns, performed critical productions" and "coordinated public testimonials" [55]. YPAR is situated and interventionist, but with less focus on pedagogy than SDBEs (discussed next). My doctoral research is inspired by the same set of commitments and methods as YPAR such situatedness, designing material interventions, and working with youth. But it is not YPAR as it does not (at least explicitly) take on an activist stance nor does it produce public outcomes of resistance and transformation.

Social Design Based Experiments (SDBEs) are a design methodology from

highlight that ethnographic descriptions are still prescribed to some extent due to the researcher positionality and other factors

the learning sciences for creating learning contexts "in which learning is made equitable and consequential for youth from nondominant communities" [138]. SBDEs probe the cultural historical means of vulnerable students and "the social situation itself" to anticipate the future and instigate change through co-design, co-deployment, continuous co-reflection, and co-revision [140, 141]. One of their defining feature is the ongoing re-imagining and modification of design goals based on the "everyday" life of people and what could be made "consequential in and across sociopolitical and sociohistorical contexts" [138]. SDBEs are then situated and pedagogical, but with less focus on intervention than YPAR. My research is very much aligned with SDBEs in its community embeddedness and the continuous reacting/revisions based on the circumstances and participants. But it is more focused on the creation of material artifacts and is not exclusively about learning or marginalized youth.

Participatory Design (PD) refers to "the involvement of prospective users and other stakeholders in the design of ... systems" [112]. The majority of this dissertation involves participatory design in its pedagogical programs, and shares the situated and design-based focus of PD. But PD is not necessarily pedagogical (that is not its primary goal especially given its application in industry settings) whereas this dissertation is invested in the affordances of pedagogy to give rise and sustain (participatory) design contexts.

Human Computer Interaction (HCI) and Design Events encompass workshops [292], hackathons [348], artathons [330], and many others organized in conferences, in community settings, or on university campuses. By increasingly approaching such events as a research method, scholars have argued that "attending carefully to the details of their design" [330] can give

rise to field sites for collaborative study [292], interrogate existing knowledge [278], and create boundary objects that support collaboration among diverse populations [263]. Achieving scale and sustainability expectedly remains a challenge with such events due to their isolated and singular nature [330, 329]. My work shares many aspects of HCI and design events including activities, collaborations, share outs, and the presence of groups from different social worlds. But it takes up a larger temporal "real estate" (which helps with developing more sustained relationships), and it entails rigorous pedagogical design and execution.

Lastly, I should briefly mention Computer Science (CS) Education Research literature, which is cited in several places in this dissertation. This literature has inspired some of the thinking behind Meaning of Home and Remaking the city, and was also the primary research approach in our lab when I started. CS education research, as the name indicates, studies the art and science of teaching computing, data, and the systems they enable [359]. This includes many facets of the learning and beyond such as "student understanding, animation/visualization/simulation systems, teaching methods, assessment, educational technology, the transfer of professional practice into the classroom, the incorporation of new development and new technologies into the classroom, transferring to remote teaching ("elearning"), recruitment and retention of students, and, finally, the construction of the discipline itself" [102]. I quickly discovered when designing Meaning of Home though that I was interested in design more broadly than CS, and I was not primarily focused on the learning science aspects of the research. But I appreciate the community that CS education has amassed across multiple disciplines and the impact it has had on my writing and thinking.

Despite the variety in axes of focus among ethnography, YPAR, SDBEs, PD, and HCI/design events, they all share a commitment to what I see as the "street view", whether attained by inviting participants to lab or campus to learn about their (social) worlds (a common model in PD and HCI), or by meeting them in their natural settings (which is the case in ethnography, YPAR, SDBEs). In a time when the limitations and biases of big data and computational models for describing the real world and prescribing actions are compounding, any of the above approaches can offer nuanced understandings for knowledge production and theory-building that are critically important. The choice depends on methods, research methods, and disciplinary and sub-disciplinary barriers.

Going back to SLIDE, I outline next what each of its dimension means in the context of this dissertation. This is by no means an attempt to theorize SLIDEs, but I hope to revisit to the term in the future as a research method in my lab.

1.3.1 Situated:

Earlier discussions of project locations, partners, and involvement with Roosevelt Island illuminate the situated nature of this dissertation. Because I lived on the island, I never really left the field site unless I hopped on a train, ferry, or tram to visit Manhattan or Queens. This allowed me to constantly be in the field site. Chapters 3 to 5 will expand and reify on the situatedness of the research. Here, I describe how the research came to be situated and community-based in the first place. This started with my involvement as a teaching assistant and field researcher in Remaking the City. The service model of the course was a catalyst for inviting several island civic organizations and engendering

some interactions. What then got me to know the leaders of the partnering organizations on a closer, more direct level was interviewing them for research purposes a month after Remaking concluded. The partners were very kind and gracious and invited me to visit them and attend their events. I took them up on their offers (which was not hard given their proximity to campus and the great events they organized). Thanks to that (and them), I recorded many observations and contexts for future research and collaborations on the island.

I also tried to make myself available whenever they needed help. Through sustained interactions, I built my own relationships with some of the organizations (and their leaders) including the island historical society, senior center, and garden club. I drew on these relationships for subsequent projects. Examples include having the older adults be our CivicDIY audience, seeking advice and data from the historical society around oral histories, and applying for and getting the Cornell Engaged grant in partnership with the island art gallery for Proxy Objects (an interactive design project described in appendix A). As for the island school, our partner for Meaning of Home, I describe how we got to work with them in more details in chapter 3. It was ultimately a similar model though of maintaining frequent interactions, showing up to (bi)weekly meetings rain or shine, and trying to show our community members in all genuineness how happy we were for their time and interest.

1.3.2 Learning-oriented:

The three empirical projects in this dissertation are pedagogical. Meaning of Home was a 13-week social studies unit for grade 7 students, Remaking the City

was a 5-month graduate level INFO course, and CivicDIY was a 6 week summer design internship. I foreground the pedagogical nature of the projects because it was not intuitive or natural for me (given my pre-PhD training) to engage in pedagogy. Nor had I ever organized pedagogical programs for research prior to the PhD. My doctoral work became pedagogical simply because that was the main mode of research conducted at our lab when I started. I was not averse to it because I had noticed during past fieldwork in refugee camps that educational programs run by the UNICEF offered researchers a few advantages (e.g. regular access to a large number of teachers and children in one context) whereas I had to physically traverse all the camps, visit families house by house, make elaborate arrangements to have participants convene, etc.

The learning-oriented nature of the fieldwork came with multiple ethnographic advantages. Some of these advantages became clear in hindsight, but I discuss them here to avoid breaking up this short discussion between this chapter and the conclusions chapter. The first advantage is a longer time frame to observe and interact with participants, establish relationality and rapport, and learn more about their lives and positionalities. Beyond the teaching activities, a pedagogical context can create an *organic, non-enforced* space for joining participants in casual chats during breaks, going to places and events with them, getting to know some of their friends and family members, and reading their homework (an extremely valuable source of data). Such longer, multi-modal engagement has afforded me a better understanding of certain dynamics such as the Pinnacle destruction proposal in CivicDIY and the youth ways of responding to ethnic difference in Meaning of Home. Seeing what participants wrote in their weekly blog posts or homework sheets is also a great way to triangulate the data and anchor some of the oral data collected. This

could make my arguments about participants better informed than if I were to see them for a one-off co-design session for example.

Another advantage with a pedagogical learning model is that its structure helps sustain participation and engagement for several weeks or months - whether because participants do not want to fail the course or because they are eager to score a certificate. Yet another advantage is that participants get something in return for their engagement such as a set of (technical) skills, new relationships, a context to launch more projects, a course credit, or a recommendation for high school and college applications. This ameliorates the benefit asymmetry problems common to research projects and ensures tangible outcomes or take-homes for the participants.

I should note that the pedagogy in the dissertation projects included many PD principles. But there were certain expectations of students/participants and a lot of elaborate work put into the pedagogy design that I opt to label my fieldwork as a pedagogical intervention rather than PD. Further, while we leveraged the same ethnographic data capturing protocols that learning scientists use (e.g. recording some classroom activities, archiving all student homework, observing and participating for the entire duration of the class), my focus was ultimately not on measuring the learning process, so this work does not fall under SDBEs or CS education.

1.3.3 Interventionist:

My situated learning-oriented design fieldwork is interventionist in nature. The term "interventionist" is tricky to define, although design researchers such

as Daniela Rosner have described workshops as "interventionist encounters" [292]. Anthropologist Tim Ingold distinguishes between observation and participation in the context of ethnography. To observe, he writes, is to "watch what is going on around and about, and of course to listen and feel as well" [165]. On the other hand, to participate "means to do so from within the current of activity in which you carry on a life alongside and together with the persons and things that capture your attention" [165]. Observing and participating within a social activity are primary tenets in ethnography. I therefore like to think of "interventionist" within my ethnographically-oriented research as an *activity* we are introducing into the field which gives us a socio-spatial context for observation or participation and a purpose of our own weaving to do the ethnography. While the work done in this dissertation relies on data produced from both observing participants and participating in the activities with them, we were always *building* something or helping our participants build things while simultaneously observing and staying with⁴ the socio-material performances unfolding through and around the introduced interventions. As the programs themselves entailed elaborate design processes, we were effectively designing an intervention - it just happened to be a pedagogical program rather than an artifact. Through that, we were tinkering with the worlds we were studying through material artefacts, and I believe that is interventionist.

⁴I illustrate this through a conflict that ensued among the research team in section 5.6.2 over honoring participant priorities

1.3.4 With Design:

At the beginning of this chapter, I noted that design has no universal definition despite the ubiquitous use of the term. In this section, I revisit what design means but in a more elaborate and contextualized manner that refers to specific parts of the dissertation introduced in the previous sections.

I never recall asking what design actually means in architecture or software engineering - we just did what we always do: design things. But here and now, there is a growing need to tend to this question. For one, an increasing number of university programs are interested in teaching their students "design" (as evident from my recent experience being on the academic job market), which raises the inevitable question: what would you teach the students and how? Further, interdisciplinary university programs such as "Information Science", "Urban Tech", and "Connected Media" attract a plethora of talents, each with their own (strong) opinion about what makes something design, so there is a need for a shared stratum around the concept.

Design and STS scholar Carl DiSalvo takes up the discussion of what design means in his book *Adversarial Design* [82]. He brings together multiple definitions of design and denotes their drastic divergences: some posit design as a science, others as a liberal art or rhetoric; some view design as a vocation of the professionals while others call for democratizing its scope and tools to non-professionals; some delineate design as an activity-based practice that can be empirically studied, yet others invite an outlook on design as an argument that incites action [82]. Two definitions DiSalvo expands one are by social scientist Herbert Simon and design studies scholar Richard Buchanan. Simon views design as a science that is action-oriented whereby "Everyone designs who

devises courses of action aimed at changing existing situations into preferred ones" [326]. On the other hand, Buchanan defines design as "the human power of conceiving, planning, and making products that serve human beings in the accomplishment of any individual or collective purpose" [47]. Buchanan, as DiSalvo notes, also foregrounds the rhetorical power held in design, in that "all products — digital and analog, tangible and intangible — are vivid arguments about how we should lead our lives" [47].

Having read DiSalvo early on in my PhD, design in this dissertation takes on rhetorical, artefact-based, and activity-based definitions but generally maintains a commitment to creating material artifacts. In chapter 3, design involves making tools and classroom activities that seek to mediate ethnic differences by finding commonalities. In chapter 4, design encompasses the pedagogy around ambiguity as well as developing tech artifacts for civic organizations. In chapter 5, design again includes the pedagogy as well as participant designs and their rhetorical moves - all which supported the articulation of difference and engaging in conversations and reflections around it.

When it comes to the actual design pedagogy I (co)developed for research, it was a bricolage of architecture, computer science, and information science curricula. I was therefore happy to teach or engage with participants through art, lo-fi prototypes, site analysis, software or hardware based design, computational analysis, interview protocols, and open coding, among other activities. My advisor also brought a plethora of skills and scaffolding around system building, website development, CS education, and participatory urban planning. Between the two of us, the fieldwork entailed teaching various design strategies, tools, and modes of thinking. The participant outcomes were

expectedly hard to categorize into a specific genre and why my work is not CS Education.

To recap, SLIDEs proved valuable to this dissertation because they gave me a more substantial and multi-faceted window to engage with participants. This means that all of the quoted voices and critical reflections came from observing and interacting with participants for a while, or seeing them in or across multiple contexts. For example, some of the students who took Meaning of Home went on to take CivicDIY, and were instrumental in shaping my thinking around the auxiliary explorations (appendix A). Analogously, some of the students and partners involved in Remaking the City worked with us on other projects including Craft@Large - a collaborative open studio initiative at Cornell Tech where community members and organizations can execute their projects in collaboration with our students and researchers. These crossing engagements help me feel more confident about the ethnographic data collected and my interpretation of it. This is not to critique common HCI and design approaches that focus on short term engagements - they too lead to valuable insights vis-à-vis other practices such as surveys and interviews [39]. But when dealing with an insoluble issue such as difference, I hope that a longer, more comprehensive engagement renders my claims more credible and meaningful.

1.4 Why Difference? Positionality Statement

I am an Arab female with research experience in Human Computer Interaction (HCI), architecture, and urban design. My upbringing in the Middle East was highly imbued with Islamic teachings. After moving to North America at the

age of 17, I continued to practice my religion by observing both individual private acts of faith such as praying and fasting, and more public aspects including wearing the hijab and limiting interactions with male colleagues. Before starting the PhD, I had a fairly seamless experience in Toronto as the city and its largest public university both offer a lot of accommodations for Muslims. Moving from Toronto to NYC to start the PhD in August, 2017 was the very first time I had ever lived away from my family. Naturally, I expected the Cornell Tech community to become my primary social engagement and support system as that was the case back in Toronto. And that did happen but not to the extent that I expected. The campus was very new (10-days old to be precise when I moved there), it did not yet have diversity and inclusion initiatives, I was the only Muslim PhD student there, and we were dealing with a challenging situation in that our doctorate program was Ithaca-based but we were NYC-based.

The (stunning) new campus never became a home for me. It only took a few weeks for reality to settle in: not being able to partake in most mainstream socializing activities (is frequent socializing over alcohol an American or an Ivy League thing?), being close with lab members (all male at the time), sharing accommodations in Airbnb's during conferences and trips, celebrating non-Muslim holidays, petting the neighbors' dogs while waiting for the elevator in the dorm, using the co-ed gym, and consuming label-less food for fear it does not meet Halal standards, among others. Attempting to bring up these differences to find a solution has been a multi-layered challenge because many of the accommodations only pertained to me and no one else needed them. The campus strongly-secular atmosphere did not help (but I acknowledge the wonderful staff, faculty, and fellow students who stood by my side and

supported me, and how far the campus has come today).

Among these experiences, I can pinpoint two moments as the impetus to this dissertation. The first was in March/April 2018, when my efforts to establish a *prayer room* on campus came to fruition - only to raise an unfavorable reaction from the campus community and force an immediate re-designation of the space from a "prayer" to a "reflection" room. The negative reaction hit harder than it probably should (but I was still in my first year, dealing with a lot of stress and a heavy work load and I took the matter personally). After shedding a few tears in the bathroom in response to the campus response to the prayer room, I went back to the lab with a renewed knowledge that difference is a thing, it is real, and to pretend that it does not exist (or that we do not see it) is just offensive. From that point on, a growing awareness was seeded in my mind and soul towards seeing *difference* and its *differentiated nature*. I began to notice that some differences in a given context (e.g. the need for a gender-neutral washroom at Cornell Tech) were less contentious than others; some differences were supported by a larger mass than others; and some differences were potent enough to expose the fragility of pluralism mandates in the face of "competing conceptions of the good" [30].

The second moment shaping the course of this dissertation was in July 2019. After completing the Meaning of Home and CivicDIY (chapters 3 and 5 respectively), I had the idea of building "proxy objects" (described more in appendix A) to showcase and demystify cultural and ethnic differences. I had a research assistant, Aila Aamir, that summer from a different institution. She too is Muslim, in computer science, and wears a headscarf. Together, we we built a hijabi mannequin using paper mache. I dressed the mannequin in one of my

headscarves and built a listening and recording device next to her. My advisor was away for a few weeks that summer, so he did not know about this until he came back and saw the finished prototype. His reaction was enthusiastic, and went something like this: *"This is great!....Why did you build this?"*. The adjective "great" in his statement does not refer to the bells and whistles on the prototype - it was the motivation behind the prototype that he appreciated. I kept trying to steer the conversation back to the technical aspects of the artifact as that is where I spent a lot of time. But he relentlessly repeated that question until I was finally able to verbalize the real reason: My "fatigue" with difference... Can't someone fight those accommodation fights on my behalf? Or tell men I don't want to shake their hands? Or arrange a bubble tea happy hour? Or, or, or....?

The prayer room moment (becoming sensitized to difference) and the Hijabi mannequin moment (admitting my frustration and fatigue with difference) were the instigating frustrations that opened up questions which I came to ponder (and later on unfold and understand through the analytic work of the dissertation). Despite the limited geographic area covered in my work, it still put me in contact with individuals and social groups across a wide range of age, ability, institutional affiliation, and socioeconomic brackets so there were plenty of differences for me to see and relate to. As I brought my own sensitizations to the fieldwork (which impacted how I interpreted, framed, and wrote about the research), working with participants in return helped me understand my own positionality, grow more comfortable with difference, and even learn how to approach it as I eventually share in chapter 7.

With this long and winding introduction, it is time to embark on the full journey, starting with what political philosophers and urban sociologists have

to say about difference.

CHAPTER 2
**DIFFERENCE AND THE CITY: THREE APPROACHES TO THE
POLITICAL**

Democracy is intrinsically contentious, even more so in large urban societies where the plurality of beliefs, practices, value systems, and future aspirations can be not only divergent but also conflictual. If we accept that pluralist democracy and inclusive consensus are impossible to fully implement or achieve, can we still achieve a sense of community that fits the multiplicity of particularities, interests, and needs in a society ruled by a single democratic logic? What dynamics and minimum requirements or thresholds have scholars set for a democracy that adequately accommodates difference? What assumptions frame these arguments, and are there assumptions that they fail to acknowledge? Further, how have forms of design currently practiced in HCI sought to nurture a culture of engagement with issues and impactful confrontation across difference in urban settings? Where have these efforts fallen short, and what new and promising directions or examples might we pursue in designing for difference? This chapter attends to these questions through readings from political philosophy, urban sociology, and design. It builds on the readings to develop a theoretical scheme for framing the dissertation around three approaches to difference: consensus-oriented public deliberations, care-imbued pluralism, and dissensus-embracing agonism.

2.1 Difference and the City

Cities are places where we are "in the presence of otherness" [318]. This otherness stems from a multiplicity of differences around "race, language, religion, standards of living, customs, cultural traditions, and ideals of government and moral conduct" [378]. As economic opportunities, better services, and zealous militant conflicts continue to drive mass migrations from one country to another and from the countryside to the city, host urban contexts have become even more different, diverse, and culturally heterogeneous. Writing in the 1910s, sociologist Georg Simmel captured how contemporary migratory trends were transforming the fabric of European cities through the emergence of the *stranger*. The stranger is "not the wanderer who comes today and leaves tomorrow. He comes today and stays tomorrow" [325]. Simmel's stranger is therefore distinct from Stanley Milgram's "familiar stranger" whom one regularly observes but does not interact with [224, 262]. The stranger participates as an active member of the dominant group while combining the contradictory qualities of remoteness and nearness. They remain distant from the full (non-stranger) group members because they were not a member from the start and are not guaranteed to continue to be one. Yet because of that distance and outsider status, the dominant group members entrust the stranger with tasks and conversations they would not internally carry out. The stranger therefore elicits a particular type of nearness and trust owing to their objective distance from existing societal depositions and biases. Alas, a stranger does not hold meaningful relationships with society members because what is shared with them: occupation, nationality, or social position, is general and generic. And while they are fixed within a geographic space, they bring qualities "into it

that are not, and cannot be, indigenous to it" [325].

According to Simmel, the stranger has historically been the trader [325], but the types and perceptions of the stranger have expanded since then. As multicultural urban contexts continue to replace the homogeneity and small-knit social circles of villages and towns in many parts of the West, the stranger has become more pervasive - even where the *non-stranger group* is hard to identify (e.g. what is that group in a city like New York?). Today, immigrants, expat workers, visiting talents, and international students are all strangers by Simmel's definition who are fixed tenets of contemporary cities and accentuate the various types of relationships found within. Dominant groups have responded in different ways to strangers including through extreme measures such as fleeing them (e.g. the Heideggerian retreat to the hut from city Jews), or isolating them (e.g. sixteenth century Venice ghettos for Jews). Contemporarily, urban sociologist Richard Sennett denotes three different ways Western societies view the stranger. The first as an alien; a figure who differs so radically that it cannot be lived together with as "the weight of difference" is too heavy [320]. The 2015 "Patriotic Europeans Against the Islamization of the West" (PEGIDA) initiative is an example of a dominant group alienating strangers. The second view is the stranger as a brother, where a "fraternal connection" is felt such as when Germans and Canadians welcomed Syrian refugees at airports and train stations with food, clothing, and flowers. The last, and most common, is as a neighbor, where one acts as "an ethical figure turned towards others, but unable ultimately to fathom them" [320]. The inclination in this neighborly view is to turn away, indifferent, "because you don't understand them" [320].

The general reaction to difference and strangerhood is then to turn away.

Intuitively, difference is uncomfortable because it threatens one's identity and beliefs, posits a destructive blow to a stable genealogy, and carries winds of deprivation and exclusion if the other takes over the resources of the collectivity. As discussed next, political philosophers [265, 160, 376, 67, 237, 79] and urban sociologists [75, 320, 319] have further identified the complexity of the urban context, the simplification of contemporary life, and the debilitating social diffusion of the global machine age as three substantive factors behind shunning away from difference:

2.1.1 Exposure and Alienation

Cities are riven with complexities that demote engagement among their dwellers and favor objective metrics. Individuals in cities find themselves alone while physically close to everyone else. The contradictory and overstimulating urban experience induces a physiological reaction that pushes city dwellers into aversion and antipathy towards the outside world as a form of self-preservation. Simmel terms this aversion *the blasé attitude* [375]. The blasé attitude leads to blasé behavior: "you see stuff happening and you move on, you don't get involved" [320]. The multicultural urban context then requires intellectualism as a physiological self-defense. Furthermore, "... the technique of metropolitan life, in general, is not conceivable without all of its activities and reciprocal relationships being organized and coordinated in the most punctual way into a firmly fixed framework of time which transcends all subjective elements" [375]. The reduction of life to numbers in the political economies of large cities therefore degenerates human relationships to the perceived benefit of those relationships (e.g. jobs and services). When the social value of human existence

is influenced by a "rational" and efficient money economy which seems to run on a ticking clock, the worth of individuals, groups and actions is determined by the amount of wealth those variables produce. Lastly, cities are inhabited the way language is appropriated [75]: they are only (at most) half one's own, as they are already defined by loaded histories, a plethora of associations, and a rigid (physical) grammar. By living in it, inhabitants wrestle with its determinism to construct meaning and symbolic outlets that bring "familiarity" despite "foreignness". Such imposed urban order, capitalist value-seeking, and exactness, coupled with the blasé attitude and impersonal cultural elements all entice turning away, and cement a feeling of strangerhood that could become perpetual for those deemed by socio-political norms to not belong.

2.1.2 Simplification and Reduction

Simplicity leads to exclusions and reducing the aptitude to face and live with difference. Architects, urban planners, engineers, computer scientists, and others have been preoccupied with removing complexity and resistance through standardization, user friendly interfaces, and friction-free interactions. Sennett argues that the simpler and more streamlined a form is, digital or physical, the "more it defines who belongs there and who doesn't" [320]. Beyond simplification, the design process in itself entails making choices which enfranchise and disenfranchise different people [374]. This leads to the following axiom: exclusion does not have to be enacted by keeping the other away; simplify a space, apparatus, or system and they will fit "one kind of person, but not others" [320]. Le Corbusier's Plan Voisin for example, homogeneous, repetitive, simple, and white-painted, symbolizes a longing

for the now and new, breaking away from past constituents and partisan dispositions [69]. In this brick mono-culture, complexities and differences have no fertile soil to flourish or attain maturity [320]. City narratives have also become simpler as they subscribe to fewer, but more powerful regimes. Beyond what unfolds through social media realms and increasingly through design, pedagogies, movements and campaigns, "stories are becoming private and sink into the secluded places in neighborhoods, families, or individuals, while the rumors propagated by the media cover everything and, gathered under the figure of the City, the masterword of an anonymous law, the substitute for all proper names" [75]. The fewer, more diffused regimes, monopolies, and systems then all aim for simpler and friction-less urban-scapes, even if that inadvertently excludes many differences.

In addition to exclusion, the "removal of resistance" from our designed worlds eradicates the need to engage in critical what/why/how questions, making contemporary urban societies increasingly uncomfortable with ambiguity and tension. According to philosopher and logician Charles S. Peirce, the value of something is not fully discerned unless it is taken apart mentally [184]. Putting in the effort (with its ambiguities and tensions) makes the individual appreciate and remember information "longer and better than if it is complete, clear and easy to access" [320]. On a sociological level, discomfort with complexity leads to shying away from that which requires mental and emotional work, such as "discerning the particularity of a black man or Muslim woman" [320]. When details and stories disappear, so does a the sense of the place: "deprived of narrations . . . the group or the individual regresses toward the disquieting, fatalistic experience of a formless, indistinct, and nocturnal totality" [75].

Seamless design in its various constellations and scopes can therefore eradicate the minimum thresholds of complexity tolerance and aptitudes necessary to co-exist in contexts riven with difference. Sennett further warns that the technological fluidity and efficiency smart cities promise could "stupidify" and numb its users/dwellers to issues around difference and agency. Pristine (and panoptic) smart cities will further discriminate against anything that counts as "abnormality, deviance, illness, death, etc." [75]. Under these near-future circumstances, a phantasmic view of democracy as an "exciting engagement with difference: the challenge of "the other"; the disruption of certainties, the recognition of ambiguities within one's self as well as one's differences with others" [265] says both what should happen and why it almost certainly won't. As complexity is eradicated behind user-friendly facades, future urban populations will not know how to lead an ethically reflexive life with strangers as they dwell in the increasingly authoritarian and streamlined technopolis.

2.1.3 Erasure and Eclipse

The urban population is not only overwhelmed by its over-stimulating life, but also too diffused and distracted to hold itself together as a public over pressing issues. Historically, the public sphere is where "concerned citizens took up issues of the common good through rational discourse" [193]. In the absence of contemporary Agoras and Pnyxes, an *othered* urban public has no coherent avenues to articulate or resist beyond social media as "public spaces are striated and hegemonically structured by dominant groups" [36]. Disarticulation is exacerbated by the individualist inclinations of liberal democracy in which

citizens feel sufficiently "equipped with the intelligence needed, under the operation of self-interest, to engage in political affairs" [79]. John Dewey contends that society members do not habitually conjoin over issues, nor does a social mass formation automatically create an acting public. But if a social mass comes to care about the consequences of these issues, a public is formed. The public then does not exist a priori - whether the urbanscape had spaces for it or not. It arises out of "those who are affected by the indirect consequences of transactions to such an extent that it is deemed necessary to have those consequences systematically cared for" [79]. Awareness of consequences is therefore fundamental in public formation. However, the "very size, heterogeneity and nobility of urban populations, the vast capital required, the technical character of the engineering problems involved, soon tire the attention . . ." [79]. Ultimately, masses that care about the consequences of social transactions exist but cannot identify or hold itself as a public.

The urban public is further "eclipsed" by corporate interests and technological advances that have connected too many communities together. The consequences of actions are now too diffused and complicated to comprehend. For example, if theorist and activist Jane Jacobs wants to protest a development in Brooklyn today, she might have to send "emails of protest to an investment committee in Qatar" [320]. In contemporary societies, "cataclysmic money", a term Jacobs coined to refer to large sums of capital that engender a trail of rapid and lucrative investments anywhere there is potential [173], is just one example of dynamics that cause indirect, substantive, and serious consequences "felt but not perceived and their origins are not found" [79]. As early as 1927, Dewey noted how the public was distracted by "too many ways of enjoyment, including radio, movies, readings, and automobile, as well

as of work, to give much thought to organization into an effective public" [79]. Written a century ago at the onset of the communication boom, Dewey's words are still relevant today. And despite the technological breakthroughs connecting congruous concerns and aspirations, "discovering the means by which a scattered, mobile and manifold public may so recognize itself as to define and express its interests" [79] is still a challenge, particularly for strangers who already stand in social crevices.

To summarize, urban contexts are riven with difference. Philosophers and urban sociologists have argued that the natural (self-preserving) inclination of urban populations is to turn away from difference and its associated complexities. This is exacerbated by technology impacts and the sheer, unfathomable, scale of urban issues that make it hard for a public to arise and maintain itself. These factors motivate my analytical approach in the next section, which is to articulate requirements for turning towards difference despite the blasé-ness urbanism exerts, the mental numbness induced by designed worlds, and the disarticulations of large-scale issues on the public.

2.2 Difference and the Political

Political theorist Sheldon Wolin wrote in 1996:

"Democracy needs to be reconceived as something other than a form of government: as a mode of being that is conditioned by bitter experience, doomed to succeed only temporarily, but is a recurrent possibility as long as the memory of the political

survives" [376]

In the previous section, Simmel [375, 325], Sennett [320, 318], and Dewey [79] offered psychological and sociological narrations of the metropolitan Western city. This section delves into the liberal democratic politics prevailing in such contexts, founded on rational frameworks, individual interests, and market-like competition. It distills arguments political philosophers have put forth to critique the pursuits of liberal democracies to rationally "resolve" inclusion, difference, and justice. It further identifies three approaches scholars have proposed to attend to the conflict, division, and antagonism inherent in the political project of ordering differentiated subjects, institutions, and values.

The term *political* in this dissertation is concerned with the dynamics that relate to or emerge out of *difference*. Politics on the other hand refer to the practices and institutions that bring order to the discord brought on by the political [82]. The political is too broad of a term to capture in one definition, so I identify in this section three general conceptions for it from political philosophy. The first views the political as "an expression of the idea that a free society composed of diversities can nonetheless enjoy moments of commonality when, through public deliberations, collective power is used to promote or protect the well-being of a collectivity" [376]. The second inception draws on feminist theories of care, and focuses on bringing pieces of pluralism into the public realm when it is "pertinent to do so", coupled with listening, "gritted-teeth tolerance of some things you hate", and a robust set of civic virtues that carry this political culture [67]. The third approach to the political is as "the dimension of antagonism that is inherent in human relations"; it is natural, productive, and must be acknowledged and engaged in contests over norms and power [241]. I

shall refer to these three inceptions as public deliberations, pluralistic care, and agonism.

2.2.1 Public Deliberations

This approach to the political builds on the deliberative democracy model of Habermas but with some elucidations and rectifications. Liberal models of Western democracy¹ typically discourage deliberations among citizens and encourage them to develop their ideas privately. Political philosopher Seyla Benhabib notes that if the public comes together in the liberal, non-deliberative model, it is to debate arguments and advance them in market-like competitions rather than develop a mutual understanding of issues [31]. The republican model is another view of democracy that exists in the West. It is invested in the values and virtues that exist among citizens, and aims to to create collective identity and public solidarity around the common good - to the point of overburdening the democratic process due to assimilation as Benhabib argues [31]. The Habermasean deliberative model addresses these limitations by building on both the republican and liberal traditions of democracy to enable decision-making that is still based on consensus/majority rule, but is informed by authentic public deliberations. His approach shares aspects of civic republicanism in that society members need to conjoin and examine their political interests as situated within the larger community rather than autonomous from it [41]. At the same time, Habermas confers with the liberal democratic tradition which sees that no consensual value system can work for society, so a level of market-like competition is

¹I use liberal (and republican) as described by Habermas and his followers and critics rather than as instantiated by a specific nationhood such as the US

required to advance a subset of the existing priorities. But he diverges from the liberal emphasis on individualism and autonomous decision making by envisioning a proceduralist-deliberative model whereby arguments are taken up in public arenas to establish mediation, form common convictions through communication, and arrive at agreements [144, 361].

One challenge with such a deliberative model is that a comprehensive degree of consensus and public reason is needed for them to converge, which can inevitably shun the pluralism inherent to the deliberating society [31, 213, 238]. This is why it becomes necessary to recognize the *coercion* at play in democratic processes. Coercion, as Jane Mansbridge notes, is an invisibilized but necessary aspect in political practices because interests among populations clash, so elected representatives must advance certain interests over others [213]. Even in majority rule, all or some citizens are coerced into what they do not want - for example through taxation, speed limits, gun controls, and urban and infrastructural reforms. The problem is not that coercion exists, but that citizens participate in it without explicit consent; in fact, it derives from "conventional unreflective consensus rooted in the internalization of social and cultural traditions" [213]. Democracies must then find ways to "fight the very coercion" they need [213].

Individual rights, freedom of speech, and oppositional political parties and interest groups help alleviate some coercion, but Mansbridge suggests that more is needed such as *protected enclaves*. Political theorists have considered several mechanisms to legitimize coercion such as making the consent-to-be-coerced explicit, saving coercion only for substantively causes such as discrimination laws, and ensuring equal participant power in decision making [23, 73, 29, 213].

Mansbridge articulates three specific criteria for legitimizing coercion: 1) that citizens must be aware it is happening, 2) they must be able to fight it, and 3) they have mechanisms to remember and question the injustices that come with it. One approach for fulfilling the criteria Mansbridge sets is by providing *deliberative protected enclaves of resistance* for non-dominant groups and losing groups to convene in, rework their strategies, and decide if they want to carry on the fight [213]. Spaces such as women's groups, cafes, and bookshops are therefore integral for democratic processes as they allow like-minded individuals to build solidarity, interpret hegemonic practices, surface the oppression they face, and strategize for the fight. Such spaces not only serve as ethical avenues to make coercion more legitimate, but they create deliberation arenas that could change current reigning practices. Mansbridge cautions that these protected enclaves must be balanced by exposure to others, for example through the agonistic encounters in the Mouffeian formulation [238, 237, 241] discussed later. This way, protected insights are exposed to reasonable criticism to prevent extremism. Mansbridge ultimately contends though that no deliberative democratic formula can create a system in which each can equally coerce and be coerced in turn [213].

Political theorist Iris Marion Young directs attention to the challenge of *pluralistic communication* when it comes to deliberations. One of the shortcomings of Habermas's model is that it hinges on rational engagement with issues, leaving no room for disagreements or "rhetorical outbursts" [384]. It assumes that participants have equal power; yet in reality, there is a social power that comes from "an internalized sense of the right one has to speak or not to speak" based on the "devaluation of some people's style of speech" and "the elevation of others" [384]. A parallel assumption in the deliberative

model is that discussion is universal and neutral, when in fact power *does enter speech* by favoring scientific and parliamentary principles that are formal, general, dispassionate, and disembodied. This favored style leans toward declaration rather than understanding, leading to speech that is assertive and confrontational rather than tentative and exploratory. Young summarizes the deliberative discussion as simply male, white, and upper-class, for those who like contests, and know the game rules. This inadvertently silences women, marginalized populations, and racial minorities whose speeches are naturally more excited, figurative, emotive, and embodied [384].

The remedy Young suggests to make deliberations more encompassing is by legitimizing "a plurality of communicative ways" in democratic arenas that still move from the individual, subjective experience to a common, objective good yet acknowledges that everyone's experience is perspectival and irreducible to a common good [384]. Further, in case that there is "absence of significant shared understanding", communicative deliberations must include *greetings, rhetoric, and storytelling* in addition to the customary speeches and arguments. Greetings are a polite way of acknowledging the otherness of others before dialogue through acts of flattery, honorific titles, smiles, handshakes, hugs, and giving and taking of food and drink. By rhetoric, Young refers to "the forms and styles of speaking that reflexively attend to the audience in speech" thus centering both speaking (which democratic deliberation is vehemently invested in) and listening [384]. The last pluralistic communication strategy Young proposes is storytelling to support a common understanding of the issues at hand by articulating the values as experienced from othered social, historical, cultural or geographic positions. Young notes that these values "... unlike norms, often cannot be justified through argument. But neither are they arbitrary. Their

basis often emerges from the situated history of a people. Through narrative the outsiders may come to understand why the insiders value what they value and why they have the priorities they have" [384]. Collectively, greetings, rhetoric, and storytelling can help engender trust, respect, sympathy, and a deeper understanding across difference.

Political scientist Anne Phillips invites us to rethink democracy altogether from a proceduralist system that advances "competitive egotism" to that which engages with the presence of the political [265]. Liberal democracy establishes decisions and norms through individuals participating as rational autonomous agents competing in a market-like structure with the goal of achieving a majority vote. This model reifies homogeneity by leaving no room for society members to directly engage with one another across their differences to make decisions that are collectively informed. Instead of eradicating difference, Philip argues that democracy should be recast as "an exciting engagement with difference: the challenge of "the other"; the disruption of certainties, the recognition of ambiguities within one's self as well as one's differences with others." [265]. This re-characterization requires expanding the focus of liberal democracy beyond politics of ideas (beliefs, opinions, interests, preferences, and goals), to the politics of *presence* (experiences, needs, values, identities). Politics of ideas alone lead to political exclusion particularly if the representatives do not have the characteristics of the people represented such as women and ethnic minorities or if the relationship between the two is vexed. Phillips notes "... when the politics of ideas is taken in isolation from what I will call the politics of presence, it does not deal adequately with the experiences of those social groups who by virtue of their race or ethnicity or religion or gender have felt themselves excluded from the democratic process" [265]. This echoes Young's

argument about the need for pluralistic means of communication that go beyond arguments and declarations. Lastly, while probing difference in democracy from the lens of group-based needs seems promising, Phillips problematizes the notion of group identities and classification as they reduce diversity and complexities within such groups to a categorical list.

The last work in the public deliberation approach to the political is Will Kymlicka's, who uses Canada as an example of group differentiated citizenship that speaks to some of the ideas engaged by Mansbridge, Young, and Phillips. Canada is a polyethnic, multi-nation state built on "accommodating difference as the essence of true equality" [187]. It has a flexible political system comprised of three types of differentiated citizenship rights. The first is self-governance claimed by the French and Aboriginal nations through which they exercise control over education, language, culture, resource development, and immigration. The second is polyethnic rights claimed by ethnic and religious minorities. The third is the special representation claimed by less populated territories and provinces. Within these three types of citizenship, groups can claim rights against their own members to protect the group from internal dissent that could destabilize it, as well as exercise rights against the larger society to protect the group from external pressures. This model could lead however to a group infringing on the rights of other groups or individuals - for example through religious orthodoxy. It can also inhibit a sense of shared identity and reduce willingness to make mutual sacrifices for a functioning democracy. Kymlicka further admits that self-governance threatens social unity, despite the shared values of freedom and justice. At the same time, denying self-governance can lead to resentment and even secession, jeopardizing that very unity. Constructing a common identity remains a "fragile and ongoing project"

in a country like Canada where two or more groups view themselves as self-governing nations and adopt a more internal rather than public approach to deliberations across difference [187].

2.2.2 Pluralistic Care

In a pluralistic society, people are both linked by circumstances and contexts and separated by diversities of age and experience, and "sunk into divergent layers of memory, perception, judgment, and action" [67]. Pluralistic care as an approach to the political decenters formal public deliberations, highlighting instead the world views, dialogical skills, time for care, and difference transcendence required for the daily social "collisions" among groups and individuals differentiated by many factors. Political theorist Bonnie Honig uses moral theorist Bernard Williams' term *dilemmas* [371] to describe the turbulence that arises due to differences inherent in pluralist societies [160]. She argues that dilemmas are not only a symptom of pluralism - they are daily experiences that constitute the contours of lived existence and are ineradicable from agency and subject identity. Hong observes that we could "think of the subject as positioned on multiple, conflictual axes of identity/difference such that her agency itself is constituted, even enabled – and not simply paralysed - by daily dilemmatic choices and negotiations. The perspectives of this subject suggest that we ought not to think only in terms of dilemmas as discrete events onto which unitary agents with diverse commitments stumble occasionally ... but perhaps also in terms of a dilemmatic space or spaces that both constitute us and form the terrain of our existence. These dilemmatic spaces vary in intensity and gravity but none is untouched by conflict and incommensurability" [160].

Honig goes a step further in delineating dilemmatic spaces by relocating difference from the outside (where it clearly manifests in pluralism and related conflicts), to the inside. Internally, difference is an ongoing struggle of "resistance", "adjustment", and "negotiation" ignited by an-ever present longing for *home* [160]. This longing elicits a "phantasmatic" image of an undisrupted home that leaves society members *unprepared* to survive a world with others full of difference, conflicts, and dilemmas. Unpreparedness "leads the subject to project its internal differences onto external Others and then to rage against them for standing in the way of its dream - both at home and elsewhere" [160]. The "zealotry" for home refuses to settle, leading to one of two scenarios: withdrawing from the other to a home elsewhere, or conquering "that tumultuous disorder" to build a home here. Honig advocates recasting the image of home so that it is no longer a promised land away from conflict, dilemmas, or difference (in fact, we develop psychologically and ethically by abandoning the comforts of home [320]). Further, the self relation with others should be normatively seen as characterized by simultaneous rage, struggle, mutuality, and debt. This leads to "an alternative future practice of politics" where you "get up and find yourself alive" despite the dilemmas and collisions with others [160].

Political theorist William Connolly advocates *deep pluralism* to move away from territoriality and difference privatization. Connolly starts by putting a responsibility on the majority within a plurality to show critical responsiveness that entails "careful listening and presumptive generosity to constituencies struggling to move from an obscure or degraded subsistence below the field of recognition, justice, obligation, rights, or legitimacy to a place on one or more of those registers" [67]. Writing in the context of sacred-secular co-existence, he

sets "agonistic respect" as a basis for deep pluralism for all sides where one has to "absorb the agony of having elements of your own faith called into question by others, and you fold agonistic contestation of others into the respect that you convey toward them" [67]. In this mode of deep pluralism, the "interdependent partisans do not automatically leave the different creeds or final ethical sources to which they appeal in the private realm... the respect side of the relationship comes from different sources for different constituencies. The respect between them is deep precisely to the extent that each can respect the other in drawing its respect from a source unfamiliar to it" [67].

A core aspect of Connolly's approach to deep pluralism is a double-entry proposition to the experience of time that leads to an ethical evolution around difference. The first entry is punctual time where one pursues the justice, legitimacy, and obligations they are already accustomed to. This is dubbed *politics of being*. The second entry is time as creative evolution, where one experiences events, sights, or learnings that jolt them out of routine consciousness. These experiences create a shift where "the tension between new experiences and the underbrush of prejudgments heretofore attached to them lead to politics of becoming" [67]. Politics that sink into this affectively imbued experience of time turn into *becoming*. This then leads to "paradoxical politics by which new and unforeseen things surge into being, such as a new and surprising religious faith, a new source of moral inspiration, a new mode of civilizational warfare, or the placement of a new right on the existing register of recognized rights" [67].

In urban contexts, Sennett calls for street benches strategically enmeshed in the city hubbub as moments where such temporal interludes, reflections and

transformations could happen [320]. Historian Michel de Certeau similarly holds the perspectival suspension from reality occurring momentarily for example by being in a voting booth or a train cart, as necessary "for the birth, outside of these things but not without them, of unknown landscapes and the strange fables of our private stories" [75]. Even in the context of socio-ecological relations, STS scholar Maria Puig de la Bellacas highlights the need to augment production time with "care time"; a time that slows down and thickens the present to attend to soil and its organisms and preserve our shared future on this planet [274]. At these moments of dwelling, "hierarchies of dogmatic orders" and individualism are muted [75]. When one dwells in an experience, they may sense a twist that shifts the experience trajectory elsewhere, sensitizing the individual to "forks not pursued as well as to some that were" [67]. Politics of being then preserve and continue, while politics of becoming engender ethical evolution. Once that dual approach to time is widely adopted, along with agonistic respect and critical responsiveness, ethical progress towards deep pluralism is made.

Connolly also expands on pluralism in relation to religion as one of the more challenging aspects to mediate and approach with care. The contention around religion in Western pluralism is due to the secular underpinnings of liberal democracy, the privatization of religion, and the dispute between transcendence and immanence [67]. Many secularists, theologians, anthropologists, philosophers, and social scientists reduce faith to a cognitive framework, ignoring its embodied and enacted aspects. Connolly writes that in the West, "rituals and exercises are understood only to symbolize a belief or faith already there, not to participate in the very constitution of faith itself" [67]. This is particularly problematic for Muslims (a "special" minority

group in Connolly's account) because Islamic faith governs many aspects of the devotee's public and private lives, so they "alone are unwilling or unable to abide" by faith privatization and its reduction to a corpora of mental beliefs [67]. Establishing secularism as the dominant regime therefore does not solve the tension by relegating religion to the private realm. In fact, the secularists' idea that faith must be left at home is in itself a form of faith [67]. Connolly deduces the inadequacy of public reason, deliberative consensus, and transparent procedures in regulating diverse faiths to co-exist because these stratagems are vested in cognitive models. Connolly then devises a multi-step plan for faith groups to achieve deep pluralism. First, individuals practicing various forms of faith must acknowledge "the ubiquity of faith to life while perceiving the potential for evil [xenophobia] within it" [67]. Periodically, they might find it "incumbent to oppose drives to self-righteous violence by their own religious leaders and by the territorial states that govern them." Second, there ought to be a 3-dimensional relational sensibility. The first dimension is pluralization, through which the cross pollination of diverse faiths across civic, corporate, and governmental institutions encourages leaders of faith communities to honor that variety. The second dimension is the positive cultivation of mystery within a faith by creating a visible culture of interdependent minorities and bringing them out of the closet. The third dimension is through practicing relational modesty through which each faith emphasizes "the religious virtue of hospitality and the civic virtue of presumptive generosity" to inhibit repressing or marginalizing other faiths. Ultimately, negotiating pluralism requires the "fugitive element of care" about the diversity of humanity [67] - where care is the ethos necessary to maintain existence (but is too multi-vocal to capture with a definition) [216, 234, 275].

A care-imbued approach to pluralism from Sennett's urban sociology perspective requires both dialogic and displacement skills. When talking to strangers, four dialogical skills are necessary: (1) listening well and being respectful of others, (2) using a subjunctive voice (e.g. using "perhaps" or "think" akin to Connolly's openness to contestability), (3) using an "it" voice to make the conversation less about the persons involved so that it's more amiable to evaluation and critique, and (4) "meandering" through informal rather than formal and agenda-riven conversations to discern unexpected meanings [320]. Regarding the last skill, Sennett explains that a "non-linear novel is far more compelling than well-made fiction; if after reading the first pages I can guess how a novel will turn out, I usually put the book down. In a city, too, heterogeneous voices and actions engage us as well-made expectations do not" [320]. As for displacement skills, immigrants are "forced into fresh experience due to displacement", so they learn to navigate their new realities by becoming "skillful flaneurs" while trying to retain a glimpse of home and memories. Non-immigrants need to do the same: navigating difference in their (home) habitats, searching for "primal warmth, intimacy and insideness", but ultimately growing by encountering complexities and differences [320]. In essence, while Honig tell us to abolish the notion of an undisrupted home [160], Sennett shows us how to navigate that home by learning from immigrants.

Finally, Sennett further attends to the physical inceptions of cities, which tend to promote indifference, despite being the natural habitats where different ages, races, classes, ways of life, and abilities crowd on its streets or in its buildings. Sennett argues that the 1850s *was the last time* urbanism tried to connect the built environment to the lived experience of difference. In that era, a "Great Generation" of designers and urban planners sought to make the city

accessible, equal, and sociable, its inclusion enabled by the "impersonal space of strangers" [320]. Haussman's Paris plan, originally conceived to curb riots and mobs and support rapid traffic flow, ultimately gave rise to the street cafe and attracted people from all classes. The repetitive block plan of Cerda's Barcelona, chamfered at the edges, grew into neighborhood gathering spaces that slowed crowds down and invited them to socialize. And in New York, Olmsted conceived Central Park as a "theatre" that brings people together from different races and classes around leisure and artificial nature, placates tension among the different demographics, and suspends for a second "the oppressiveness of the city" [320].

What then does it take to restore that ethical urban commitment to difference? The built environment can contribute to increasing complexity for example through public spaces that promote synchronous activities. Physical markers can affect focus, reducing the speed at which people could navigate the city so that they are aware of the particularities of the environment. Sennett suggests include obelisks denoting important places, crossroads creating awakening jolts, and street benches making people sit and observe arbitrary, problematic or valuable phenomenon. Borders, rather than boundaries, can create porosity between different city parts and demographics, enticing exploration and cross pollination, for example by locating community resources at community edges. Such city would restore the Greek's "depth of wonder which has diminished in our more jaded age... that a potter could keep a pot from cracking, or that the colours in which their statues were painted were so vibrant, whereas we wonder only at things which are new" [320]. Shape forms, i.e. forms that are easy to adapt and vary, constructed partially complete can allow the different city parts to grow into their diversity, yielding a complex

image of the urban whole. Instead of "cataclysmic money", Sennett invokes Jacobs's call for "gradual money", which is modest in amount, addressing modest everyday needs: building a play place, investing in street furniture or trees, a loan to the local grocery for a face-lift. This slowness dictates a small scale. In this city, conformity and neutrality are no longer a spatial social control mechanism that reifies the liberal "nothing outside really matters" [320]. These planing principles, along with embracing a view of home as riven with difference and dilemmas, living time in dual modes, showing agonistic respect and critical responsiveness, and gaining dialogical and displacement skills are some requirements scholars have set to cultivate pluralistic care.

2.2.3 Agonism

Conviviality and civility are necessary dampers when diverse groups interact with each other, be it in public deliberation contexts or during daily pluralistic encounters, but a healthy democracy also requires agonistic confrontations in parallel. As discussed earlier, Young makes a case for greetings and flatteries as forms of pluralistic communication in deliberation arenas where the public comes together over issues that matter to them [384]. Sennett echoes the important role greetings play in the daily chafing across mixed groups, but dubs these greetings (e.g. inquiries about one's day, or complimenting one's headscarf/dark skin/ethnic foods), *superficial civilities* [320]. These civilities are superficial as they are generally "bland", "blasé", "impersonal", and conceal one's true feelings. At the same time, they are necessary for maintaining social connections and can even heal ruptures. For example, a large Jewish-owned jewelry storage facility in London's Hatton Garden neighborhood was robbed in

2015, sparking suspicion among its mixed residents. Rumors naturally pointed to the Muslim residents. Until the real thieves were arrested (they turned out to be non-Muslim), Sennett recalls in his daily observations that the Muslim and Jewish sides responded to the tension with exaggerated greetings when running into each other, flattery (e.g. "your baby is growing up so fast"), and showing support (e.g. taking down Palestinian flags). Compared to the "Heideggerian withdrawal from others", or marginalizing the other, superficial civilities can smooth contact across difference even if they are "blasé" or hide how people really feel [320]. Alas, Sennett cautions that "mixed communities work well only so long as consciousness of the Other is not foregrounded. If something causes that foregrounding, then the weight of others is felt closer up, and mistrust can set in. ... a community ... has come close to the trigger condition" [320]. Events such as the robbery, "inflated by rumour" or exacerbated by miscommunication, misunderstandings, or existing biases, can "trigger violent confrontations in mixed communities" [320], reminding us that such acts of civilities are just that: acts and superficial. Civilities therefore help navigate day to day pluralist interactions or when the goal is to deliberate and establish consensus. But they do not address underlying ruptures, so with sufficient stimuli or destabilization, people become "suddenly unable to stand the sight of one another" [320]. It is due to this quandary, which public deliberations and pluralistic care slap a lid of conviviality and superficial harmony on, that Mouffe (and others) propose *agonism* [238, 241, 237].

To political theorist Chantal Mouffe, the pluralism at the heart of liberal democracy is an "axiological principle" that legitimizes conflict, division, the emergence of individual freedoms, as well as equality for all [237]. Paradoxically, the main focus of liberal democracy and popular sovereignty

(e.g. constitutional, communitarian, representative, parliamentary, and modern democracy) is proceduralizing processes to deal with difference, make it irrelevant, and relegate it to the private sphere through claims of rationality, objectivity, neutrality, universalism, and the common good. But a democratic society "cannot be conceived any more as a society that would have realized the dream of a perfect harmony in social relations" [238]. In fact, the real threat to democracy is "to negate the ineradicable character of antagonism and aim for a universal rational consensus" [238] - this ineradicable character is what the political means for Mouffe. Given that citizens have diverging and even conflicting conceptions of the good, a democratic zeal for consensus and harmony can conceal boiling violence, repression, and antipathy behind fragile rationality façades. Another problem Mouffe identifies with such democratic orders is that their conceptions of rights and ethics are based on theoretical conceptions of justice and morality, rather than social and moral interactions of that community. With little regard to the historical, social, embodied, and political dimensions, a society's political identity is constructed without necessary articulation or struggle [237].

Mouffe accordingly proposes a radical democracy model where citizenship is not just one of many possible identities (which is the case in liberal democracy) or the dominant identity (as in republicanism). Rather, individuals are each seen as "an ensemble of subject positions" corresponding to the multiplicity of social relations in which these positions are inscribed, constructed by a diversity of discourses, and in constant displacement and determination [237]. Citizenship then becomes a common political identity whereby people engage "in many different purposive enterprises and with differing conceptions of the good", but submit to a set of common ethico-

political values that are inscribed in the community and "articulated through new egalitarian social relations, practices and institutions" [237]. These new dynamics do not shy away from the component of violence and hostility inherent to social relations. Instead, they consider how to create the conditions under which conflictual forces can be expressed, confronted, defused and diverted. This includes making permanent spaces for confrontations and contestations, as various members of the public engage in passionate disagreements and dialogues that tinker with orders and hegemonies not rooted in their current conceptions of the good. Hypothetically, these approaches can inhibit any concentration of interests from holding a monopoly on power or decision-making. But power and exclusion can never be fully erased in radical democracy. Instead, they are made visible so that they can be contested. Lastly, Mouffe reiterates that politics cannot be reduced to rationality, precisely because it indicates the limits of rationality, and that "[c]onflict and confrontation indicate that democracy is alive and inhabited by pluralism" [238]. *Embracing productive conflict* and making contexts for it is then what gives rise to agonism, where the ultimate goal is to continuously destabilize hegemony and build a political identity true to pluralist citizenry.

It should be noted that Connolly (discussed in the pluralistic care) is also an agonism proponent as evident by his "agonistic respect" requirement for pluralism [67]. This requirement referred to accepting in silent agony others questioning one's ideals, and subsuming one's skepticism towards their ideals through respect. But agonism and pluralistic care differ particularly in their underlying logic and motives. Mouffe's agonistic democracy emphasizes the "polyphony of voices" in a mixed society the way Connolly posits pluralism as a way of life. But Mouffe emphasizes the need to transform liberal democracies

as a whole to agonistic ones to create a more inclusive and egalitarian society. Connolly's pluralist inceptions work at a smaller level, which is that of political and moral institutions as well as acting on one's self. Mouffe's agonistic democracy sees opposing views as essential to a thriving democracy and removes the label of enemies from their holders. In their contestations, multiple collective identities struggle with differentiated positions in order to choose an alternative. On the other hand, agonistic respect as Connolly puts it is a "kissing cousin of liberal tolerance . . . liberal tolerance is bestowed upon private minorities by a putative majority occupying the authoritative, public center" [67]. Agonistic respect is therefore a more ethical step than tolerance as the latter exists so long as the public majority allows it to exist. The same can be said about public deliberations, since liberal tolerance is what makes them possible. But Connolly admits, "people seldom enjoy being tolerated that much, since it carries the onus of being at the mercy of a putative majority that often construes its own position to be beyond question" [67].

For Mouffe, difference is an a priori human condition rather than a fracture towards social cohesion or political sovereignty that needs to be tolerated. Further, democracy can never be an end state or a finished project, so "to imagine that pluralist democracy could ever be perfectly instantiated is to transform it into a self-refuting ideal, since the condition of possibility of a pluralist democracy is at the same time the condition of impossibility of its perfect implementation" [241]. Finally, institutions in Connolly's theorizing are tasked with disciplining, creating and instilling a sense of common ethos in the public to form a national sovereignty in the presence of pluralism. For Mouffe, once the preconditions for agonistic democracy are brought to existence, institutions maintain an ethical society by defusing possible violence

as the various members of its public engage in constructive dialogue and passionate disagreements that destabilize hegemonic systems not rooted in its values.

The next section will investigate how Human Computer Interaction (HCI) engages with the political through aesthetics and participatory design contexts that support engagement with issues, including through agonism.

2.3 Design and the Political

Design and STS scholar Carl Disalvo writes in his 2012 *Adversarial Design* book:

"We are familiar with design for politics but less familiar with political design. We have fewer ways of describing and analyzing what the political is doing and how it is doing it"

[82]

Design is a "deliberate and directed approach ... taken to the invention and making of products or services to shape the environment through the manipulation of materials and experiences" [82]. A traditional take on design sets it as a practice that for solving problems and delivering products to the market such that it affirms the status quo [89]. But design as leveraged in HCI (and in this dissertation), takes on a more expansive scope that includes deliberative [342], speculative [28, 89], evocative [148, 147], expressive [83], and/or reflective [317] processes to support articulation and conversation with individuals and communities through innovative socio-material assemblies.

Scholars and researchers engaged in this mode of design establish that "the basis for assessment and judgment is not whether an issue or situation resolved through design. Rather the basis for assessment and judgment is whether we now have a better recognition and understanding of the contours of the issue or situation" [83]. Such reformulation speaks to the critiques philosophers and sociologists expressed in the last section about the tendency of Western liberal democracies to discourage deliberations, encourage citizens to develop their ideas privately, and only engage in arguments rather than efforts to understand each other. This section therefore reviews three seminal HCI works that engage with the political by supporting the formation of publics around issues [194], enabling agonism through adversarial designs [82], and giving rise to agonistic assemblies around participatory design [36].

2.3.1 Participatory Design and Publics

HCI has turned to participatory design (PD) to aid public formation, increase participation rates, and empower marginalized voices. Dewey establishes that an act is public when its "indirect consequences are recognized and there is effort to regulate them" - whether the act itself is done in public or private [79]. A public in turn forms when citizens experience and gather around issues with public consequences that are pertinent to them such as unemployment, housing insecurity, and lack of healthcare. But the unfathomable scale of issues affecting urban populations, who are already "diffused" and "distracted" as Dewey contends, have made it challenging for them to organize themselves around shared concerns [79]. Technology and globalization in turn, which have enabled/supported unprecedented forms of engagement across citizens, have

also implicated/alienated public formation by expanding the scope and reach of public and private acts and their public impacts.

For design scholars Christopher La Dantec and Carl DiSalvo, PD can provide the opportunity and mechanisms for various groups to form multiple public bodies, organized and thriving around design and shared issues [193, 194]. A PD that supports the rise of publics would "specifically address the ways in which participants endeavor to enact desired futures and prompt change" [194]. This "articulation of issues in publics, and the embrace of conflict and contention in the formation of a public ... differentiates publics from other concepts such as stakeholders" [194]. La Dantec and DiSalvo share two community-based projects that bring technology to underprivileged groups as a form of constructing publics.

The first project, the Community Resource Messenger (CRM) , builds a resource access kiosk for an emergency shelter for single-mother families across two, situatedly defined publics [194]. Prior to CRM, information about resources were shared through one-on-one counseling sessions with case managers, thus capping the number of beneficiaries due to limited staff. By making information available through a kiosk, those providing help were able to distribute information and resources more effectively and to a wider segment of the population while recipients connected to more resources and with each other. Le Dantec and DiSalvo distinguish between two CRM publics whom they engaged with differently through participatory design activities that converged on a kiosk: the shelter staff public and the shelter residents public. The delineation of publics stems from the divergence of needs (managing vs. accessing resources), and due to the fluid nature of the second public composed

of families that continuously join or leave the shelter. Further, the CRM project was originally intended to target a wide cross-section of homelessness. The focus was then narrowed down to single mothers with children as dictated by the shelter in which the research work was conducted in. Such exclusion shifted the pre-determined public formation into a situated one. Both the two-public distinction and exclusion illuminate that the public is not an autonomous, undifferentiated mass. This practically informs our understanding of Dewey's public formulation which does not break down the public into tiers around shared issues but assumes the formation of homogeneous publics along them [194, 193].

The second project Le Dantec and DiSalvo draw upon to concretize the intricacies of publics is the Community Sensing Project (CSP), carried out in a small town in the US [194]. The project started as an opportunity to bolster the identity of an economically depressed neighborhood and increase resident agency, particularly around a bridge repair issue that threatened to increase incoming traffic, commuters, pollution and noise. A public emerged to combat this shared issue through regular meetings, design workshops, and the premise of deploying robotics and sensors to measure traffic and pollution. Six community members regularly attended the weekly PD workshops at the library, with most having a maximum of twelve attendees. As the technology required for traffic monitoring was not available in the community, outside experts had to be brought in and become part of the public. The group therefore grew in size and diversity, but the "original set of community organizers and participants explicitly expressed a desire to maintain the group's identity and functioning as a coherent singular entity, as a group dedicated to addressing this problem in *this* manner" [194]. Among this singular public, conflict naturally

surfaced for example around starting a pirate radio for the town, the channel content, and the content source, which "became an issue requiring direction and management" [194]. The discord suggests that within a public, there is a need to establish a hierarchy, manage, and control how the issued is addressed. What the hierarchy should be is unclear from this work, but CSP echoes that a general, autonomous, undifferentiated, and smoothly operating notion of public does not really capture the tapestries of differences and conflict within it, and dictates the necessity of some form of a patriarchal order.

Le Dantec and DiSalvo make another important contribution in this work, which is the delineation between "enabling participation" and "constituting publics" [193, 194]. The latter cannot be assumed to be a natural consequence of the former, as it requires discovering and expressing *attachments*. Building on Latour [189] and Marres [215], Le Dantec and DiSalvo define attachments as the "social and material dependencies and commitments of the people involved" [194]. Such attachments to issues, and the relationships, emotions, beliefs, conflicts, and dependencies within a public are essential "to convey the consequences of an issue and to enroll others in a cause" [194]. This aligns with the centrality of consequences to Dewey's definition of the public. It also elucidates that a mandate for HCI practitioners is not only to engender or increase participation around an issue through PD to form a public, but also to identify and form attachments so that a public "adheres".

2.3.2 Adversarial Design

Adversarial design takes an object-oriented, technology-centered approach for doing the work of agonism, which is confrontations and contestations, through the making of products and services, and the users experience with them. DiSalvo sets three agendas for adversarial design: revealing *hegemony*, reconfiguring the *remainder*, and giving rise to agonistic collectives [82]. In the early twentieth century, Marxist philosopher Antonio Gramsci [134] described *hegemony* as "the way one group develops dominance over another group not by force but by obtaining implicit consent from the subordinate group through social manipulation" [82]. His definition sets dominance and class as central to the concept of hegemony. Eight decades later, Mouffe and Laclau [188] expanded Gramsci's theorizing of hegemony beyond class, defining it instead as a set of "related factors, actions, intentions, and objects that are in constant flux" and need to be constantly examined, questioned, and put under pressure from multiple positions [82]. As for the term *remainder*, it describes in DiSalvo's work the "people, practices, and discourses that are overlooked or written out of institutions, policies, legislation, and theories in the attempt [to] produce a consensus that lacks conflict or disruptive differences" [82]. Adversarial design then includes the excluded and makes it "the dominant character of the designed thing" [82].

In the book with the same name, DiSalvo uses adversarial design as a lens to identify and analyze existing data visualizations, social robots, and ubicomp systems concerned with understanding current conditions, and making contestational ideas, beliefs, and capacities for action experientially accessible and known [82]. State-Machine: Agency is an example of an

adversarial data visualization he cites, which depicts where money supporting electoral campaigns comes from, thus revealing to voters possible biases and hegemonic yet invisibilized political correlations [57]. Staying in the domain of politics and resistance, another example DiSalvo considers to be adversarial is the Ad-hoc Network Travel Mug designed by Mark Shephard [321]. As surveillance becomes more pervasive and intrusive, circumventing that becomes a priority for the remainder to find and communicate with each other without the watching eyes of authority. The mugs therefore serve as input and routing devices capable of sending short messages to other mugs through a closed network, allowing users to momentarily evade established surveillance networks. The core concept of the mug network is contestation through "a design of connectedness achieved by embedding computational technologies into everyday objects and then networking those objects together" [82]. In addition to bypassing official communication channels and structures, the short-range network is not fixed in place but moves with the user and is only active when enough users are near each other.

Adversarial designs do not have to be networked to reveal hegemony or support the remainder; the CCD-Me-Not Umbrella [322] example DiSalvo discusses is equipped with LED lights that distort the environment for CCD surveillance cameras, inhibit vision algorithms from creating clear images, and hide its user from surveillance. Recalling Mouffe's words "disarticulating the existing order is a particular task of agonism" [240], CCD-Me Not and the Ad-Hoc roast network envision what DiSalvo terms a counter-collective, thus providing the marginalized with tools to connect and dismantle systematic surveillance.

Along with revealing hegemony and configuring the remainder, adversarial design supports the rise of agonistic collectives through social robots and ubicomp systems. Social robots are distinct from other types of robots because they are not intended to replace human labor, but to provide a sense of community and connection [82]. Their interactive conversational capacities entail a political edge inherent to any social interaction, which begs the question: how have the expectations and relations between humans and robots been established and reinforced [51, 82]? Considering and applying agonistic encounters to social robots can then "expose perspectives and assumptions in robot design and make veiled issues available for inquiry and critical design" [82]. A specific example for this design is Amy and Klara, a robotic system composed of two synthetic speech robots which can escalate their conversation into quarrels and foul language [51]. Their designer Marc Böhlen notes that machines "that curse and pick a fight might offer a more realistic preparation for a shared future between machines and humans", thus contesting normative human-robot interactions which are typically dubbed as productive and cooperative [50].

In the same vein, Usman Haque's Natural Fuse [149] materializes a "series of problematic relations between desires, actions, and consequences and thereby functions as an open, interpretive, and participatory space of contest" — thus giving rise to a technology-mediated human-human agonistic collective [82]. The Fuse contains individual nodes, each made up of a lamp, a plant, and a switch, connected together via a network. The plants cap lamp use, which can lit up but only as much as its associated plant offsets carbon. Users who exceed the sink of their plants can overtake that of other plants in the network, which causes the disenfranchised lamps to turn off. Connecting multiple Natural

Fuse sets creates nodes in a system where users can take more power (selfish consumption) at the expense of killing other plants, stay in the dark (off), or attempt an equilibrium (selfless consumption). The underlying design principle is the prisoner's dilemma; a limited resource used by different individuals who must make a decision that affects everyone else. Through this exploration of "relationships between individual needs and desires and the notion of a common welfare with regard to mitigating climate change", design is not used to provide a solution, but to "problematize the situation", and give rise to many possible conflicts through the design of a system that is predisposed to disequilibrium [82].

In summary, adversarial design provides a highly aestheticized technology-enabled approach to revealing invisible hegemonic power structures. It seeks to equip the "remainder" with tools to combat that hegemony. And it supports disarticulating existing systems and norms through agonistic engagement with politics, ethics, and social associations that build "new sites and practices of contestation" necessary for democratic politics [82].

2.3.3 PD-Oriented Agonism

The second approach to design and agonism is found primarily in the work of Bjorgvinsson et al. on agonistic participatory design (PD) at the Malmo Living Labs (MLL) in Sweden [36, 35]. The researchers use PD to support social assemblages and the conflicts that arise around them when engaging with issues of political nature. In these "agonistic public spaces" [34], design activities center controversies and pluralism among participants working together to

open up "new ways of thinking and behaving" [36]. The Malmo Living Labs are located in a university city with a large immigrant population, so an incessant concern there is how to build connections among the heterogeneous residents. One of the lab mandates is to explore how design and innovation can democratize future-making beyond hegemonic social groups. The authors report on their work with The Voice and Face of The Street (RGRA), a hip-hop youth organisation made up of first and second generation immigrants who orchestrate "multi-ethnic encounters" through performance and art to address integration and stigma towards immigrants [36]. RGRA engaged with MLL to improve their presence in the media and urban landscape by co-designing a barcode beat maker. The youth performed at a major grocery store in the city "by scanning grocery barcodes that were converted into unique hip-hop loops" [36]. Their public performance challenged the hegemonic Swedish attitude towards Arab immigrants, who are carefully surveilled while shopping.

Breaking through hegemony does not always unfold without negative consequences as evident from MLL's collaboration with the Herrgård's Women Association (HWA). HWA was established in Sweden with 200 Middle Eastern women and 200 children who felt excluded from society due to their limited language skills and diasporic identity. They formed an association to support each other, cultivate awareness around health and societal issues, and gain vocational skills [35]. MLL researchers worked with HWA with the intent of bridging their skills to Swedish society and increase their recognition within it. In *infrastructuring* HWA's engagement with MLL (i.e. the process of building socio-material bridges and establishing needs [178]), Bjorgvinsson et al. explored how HWA could support refugee orphans and cater food to corporate offices while acquiring social media skills. HWA members proved

resourceful and successful in their food ventures but were held back by their limited understanding of a hegemonic context and business system [36, 35]. For example, the researchers' attempt to connect HWA with a network of Swedish businesswomen failed as HWA insisted on building their constellation as a "collective" through which they faced a foreign society together. The Swedish business experts on the other hand valorized "individual" development as the basis for the Western liberal economy.

The members found themselves also challenged by another hegemony - but in their domestic contexts. HWA women attempted to honor a traditional patriarchal family model in which men were in charge of financial matters and being out in society, yet these very same men "have lost their authority on arriving in Sweden since many of them are unemployed" [35]. The women had therefore been unsure about how to handle their booming culinary ventures which challenged their familial traditions. As they maintained secrecy about their work while collaborating with MLL, HWA premises were firebombed twice within a few months and legal papers stolen. The police did not take a stance as Bjorgvinsson et al. report [36]. The authors speculate about a few reasons: for example that the women were challenging authority (as generating profit as an NGO with small overhead expenses is questionable by Swedish union laws), starting to break into Swedish society without an assimilation process (e.g. becoming proficient in the language), or clashing with traditional family dynamics. Whatever the cause, this work on destabilizing existing systems on multiple fronts raises considerable concerns about the cost of challenging "authority and hegemony", especially when one is a stranger, and the external factors restricting PD before it even gets to the co-design stage. We are further reminded that ethical and moral concerns require projecting the

risks and possible backlash against already marginalized communities when engaging in adversarial, agonistic, or non-normative trajectories.

2.3.4 Design, Publics, and Agonism Recap

Design can provide socio-material contexts for citizens to gather around matters of concern, voice their opinions, and participate as (agonistic) publics [81, 194, 35, 34]. As the primary mode of engaging with the political in HCI, design for agonism centers conflict "that is not merely symbolic", that has "social, material, and experiential consequences", yet "does not result in the annihilation of the other" [82]. It makes clear that we have to "abandon the notion that any one design will completely or even adequately address our social concerns or resolve our social issues", so that such design "can provide those spaces of confrontation — in the form of products, services, events, and processes — through which political concerns and issues can [be] expressed and engaged" [82].

The works discussed in this section provide many lessons about what it takes (and means) to work with difference publics. Given the way dominant groups establish themselves through various institutions that force strangers or the marginalized to comply, HCI scholars use publics and counter publics to "tinker" with channels of power and dominance through design. Recalling the Ad-Hoc roast network [321] and the CCD-Me Not Umbrella [322] projects for example, these designs target different hegemonic systems and institutions (security, surveillance, and urban terrorism). They expose linkages that could be prone to disruption which also inscribe certain undesirable hegemonic

traces. Through the disruption of linkages, the counter public is able to reveal previously hidden power structures. Exploiting that weakness and using direct and specific action to disconnect various linkages can help catalyze the formation of public/agonistic publics/counter collectives.

But many of these adversarial works are speculative. A productive takeaway in fact is the contrast between adversarial design [82], which follows a safe approach to conflict and difference, and the debilitating circumstances Bjorgvinsson et al. [36] faced in their community-situated work. The works DiSalvo cites as adversarial create or add (e.g. social robots, data visualizations, or ubicomp systems) but never remove, destroy, or unmake to tinker with hegemony. The outcomes are anticipated to be positive: citizens become better informed voters if they understand candidates' funding, State surveillance is bypassed, and the environment is detoxified, etc. The projects are constructed and showcased in lab, web, or exhibition contexts that are not generally tied to explicit material contexts where difference and conflict can cause real or consequential friction. Lastly, and as DiSalvo admits, these works depend on a high/professional sense of aesthetics to articulate world phenomena and "lure" people into considering or using them (in a way that cannot be attained when working with novice participants) [82]. In contrast, Bjorgvinsson et al.'s work, in its multi-dimensional altercations with hegemony (Middle Eastern family traditions, Swedish cultural norms, Nordic union laws), was incapacitated by the very real and debilitating reality it sought to question and destabilize.

These two extremes raise important questions for reflection and future work: is there a middle ground where hegemony is "tinkered" with in a way that protects the participants yet has some form of impact beyond the mere

production of *aestheticized* (and safely detached) artifacts? Further, in a market economy where value producing institutions and socio-material relationships have a higher chance to survive in the long term, is it a realistic goal for scholarly design work to implement changes as ambitious as agonism (i.e. destabilizing the hegemonic ruling system)? More pragmatically, are there forms of aesthetics that are speculative but not "spectacular" - which would help citizens construct designs for the political despite being novices in design? And for the sake of impact, should this mode of design focus on constructing publics rather than making objects? Some of these questions will be tended to later in chapters 4, 5, and 6.

2.4 Synthesis

Against a backdrop of overstimulating urban contexts [325, 375], numbing designed worlds [320, 75], and a scattered public [79], the scholars discussed in this chapter have set several approaches and requirements to make Western liberal societies better suited for pluralities of existence. For a public deliberations approach aimed at consensual decision making, requirements include admitting coercion [213], creating protective enclaves for those losing public deliberations [213], pluralizing deliberation protocols [384], and augmenting idea-based deliberations with a politics of presence [265]. The pluralistic care approach, which applies to day-to-day activities, entails opening up minds, hearts, institutions, and physical environments to stories, dilemmas, complexities, critical curiosity, and practices that break from inscribed norms through interactions and introspections [320, 75, 67, 160]. Finally, the agonistic approach, envisioned to ensure a legitimate democracy, requires a distributive

power where diverse voices carry out a contestational labor, constantly transforming hegemonic values, and re-devising a political set of ethos as the common ground among a differentiated populace [238, 241, 237]. The chapter also covered the practical aspects of activating some approaches to the political (agonism specifically) through a niche set of works in HCI such as participatory design with publics [194], adversarial design [82] and agonistic participatory design [36, 35].

The requirements making up the three approaches to the political are contingent upon several multi-level assumptions. Mansbridge admits that democracy is capitalist, racist, classist, and patriarchal, so the aforementioned requirements suggest a revolutionary overhaul that inspires states to take on such substantive changes [213]. The requirements further assume overarching interventions at all levels where "institutions, disciplines, prohibitions, and channels ... install the same habits, sentiments, and self-restraints in the citizenry, to create a national ethos of sovereignty" [67]. These requirements presuppose that we master ourselves because "who belongs and does not belong are not inscribed in law alone. They also reside in the daily practices of the majority, in how it responds in public places, in the workplace, on stage, in commercial life, at dinner parties, in the courtroom, at the police station, and so on" [67]. The requirements imagine a level of mutual civic/political virtues that serve the common good and grant personal liberty, which circle back to the assumptions Habermas inscribes in his deliberative democratic model. Lastly, there is an assumption that issues and consequences around the political are investigated and reported with a genuine interest in public good.

2.4.1 Missed Assumptions

Difference as Phil Wood and Charles Landry put it in *The Intercultural City*, "takes many forms. It acknowledges that population groups, differentiated by criteria of age, gender, class, dis/ability, ethnicity, ... culture and religion, have different claims on the city for a full life" [379]. Scholars in this chapter acknowledge that difference is nuanced (enough that using group identities runs the risk of essentialism [265]) and that power is ultimately in the hands of the majority [67]. But they do not attend to the power differentials inherent in the various constellations of difference within a given context. An encounter across difference, whether in a deliberation arena, a casual daily interaction, or over dissensus, is not a level field. For example, activating a gender-neutral bathroom policy in my institution was not as conflictual as establishing a prayer room. Similarly, while colleges, women centers, bookstores, and cafes are vital protective enclaves [213], places of worship (also protective enclaves) are subject to increased surveillance and prosecution on the pretext of potentially harboring terrorism.

Further, a more subtle assumption made through the requirements to approaching difference is to treat difference as a terrain of identifiers that can be grouped, shuffled around, and equated. But difference is far more than a label; it often engulfs the lived experience of doing things in certain ways, potentially hailing from a long trail of traditions, and in divergent ways that may not fit together or should not be directly compared. An example is Connolly equating Abrahamic religions with the ideology of a single philosopher (William James) when arguing that one needs to show their faith as profoundly contestable to others [67]. This is a point I cannot agree with

as a Muslim, and my foundational objection is with allowing one's faith to be made profoundly contestable to others (who might be only marginally knowledgeable about that faith). Further, the equality Connolly suggests can (from my view) be insensitive to the masses of Jews, Muslims, and Christians who have practiced their faith for centuries with scriptures, devotees, dedicated institutions, and fields of study too numerous to amount to that a single man. Despite the genuine agonistic respect shown, Connolly's attempt to equalize the two for the servitude of pluralistic care emulates from my perspective the same rationalism, essentialism, and universalism of Enlightenment and liberal democracy scholars have set to critique.

Lastly, scholars read in this chapter who focus explicitly on difference and the city do not acknowledge that the freedom to navigate (life or the city more specifically) is differentially distributed. Many of them speak with a hopeful and romantic tone about difference from a (relatively privileged) epistemological and class standpoints. For example, the seamless flaneur experience, implicit in Sennett and de Certeau [75, 320], do not foreground the differential experience of cities from various vantage points or vulnerabilities. What about the experience of the city (or the political) as a scary threat? As exhausting, draining, or alienating? What about political encounters across difference that are not rooted in constructive deliberations, ethical curiosity, or respect? These questions reiterate the tricky assumptions behind some of the requirements, including the neutral/homogeneous treatment of difference.

Notwithstanding, these scholarly works are generally theoretical and abstract, and it is only with more contextual mappings that hegemony can be highlighted and power asymmetries within difference and pluralism teased

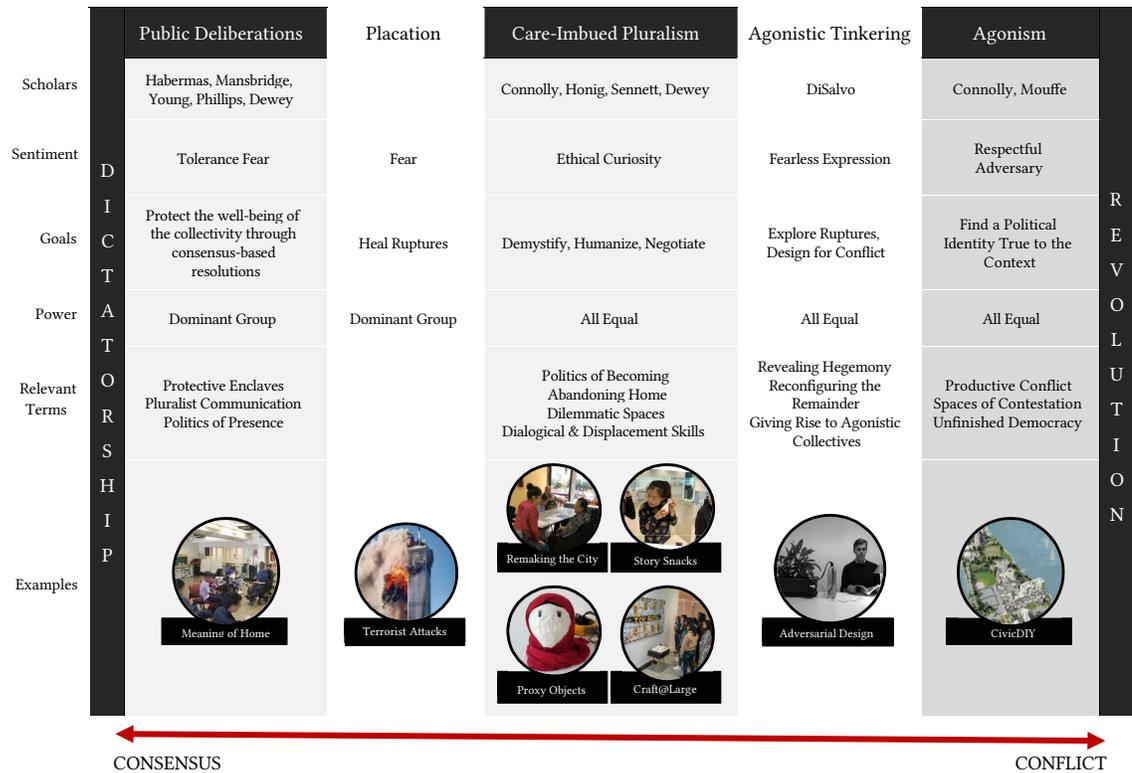


Figure 2.1: Proposed Spectrum of the Political

out. A productive takeaway here then is that *we cannot talk about difference without locating the hegemony it is enmeshed in*, and the relevant priorities, coercion, retributions, allies, and opportunities in that hegemony.

2.4.2 A Spectrum of the Political

The three approaches to difference identified in this chapter can generate more ways to see the political, including as a continuum based on the level of consensus attempted or conflict tolerated. As I suggest in Figure 2.1, dictatorship (which assumes default consensus with the ruling regime) and revolutions (which hold that no form of consensus is possible or all attempts have been exhausted) sit well on the two ends of the spectrum. I further

suggest two more stances that cannot be folded within the other five political approaches: *placation* and *agonistic tinkering*. Placation is a stance that combines fear with care to sustain co-existence. It is a position marginalized or non-dominant groups revert to when members of their groups (or others in the name of that group) commit a felony against the majority. Classic examples include crimes by black persons or faith-motivated terrorist attacks. In a placative state, the non-dominant group must mend the rupture out of fear of retaliation, fear for their lives/well-being/rights, and care for those affected. For example, when someone commits a violent attack in the name of Islam, fellow Muslims and I find ourselves in that fragile and involved state of fear (of counter attacks and microaggressions, which do happen), care (towards those who were scared or affected), and repair (of the rupture created, declaring what was done is non-Islamic, what Islamic actually says, etc.). This does not fit into care-imbued pluralism, because there is still a power asymmetry between the two groups and a fear sentiment.

I further propose agonistic tinkering as a stage before agonism. Practically speaking, many works in design and HCI (e.g. adversarial design) approach agonism from a hypothetical or controlled stance that is still steps away from the dissensus arenas Mouffe envisions. Agonistic tinkering though opens up exciting opportunities for creating ruptures and exploring disruptive alternatives from a hypothetical position of power not possible in real life. The last approach on the spectrum is agonism, which sets out to destabilize and re-define hegemony through a formal recognition of conflictual engagements within the polity and a continuous restructuring of political identities. The three chapters to follow will showcase empirical investigations of the three approaches covered in this chapters as laid out in chapter 1.

CHAPTER 3

DEFYING DIFFERENCE BY DESIGN: REFLECTIONS FROM AN ORAL HISTORY PROJECT WITH YOUTH



Figure 3.1: Oral history interviews at the local long-term care facility. Right: In-class transcript processing

Identifying and enjoying moments of commonalities among a public is one possible approach to the political. This chapter describes how seventh grade students from an ethnically diverse public school at a major American city surfaced commonalities among them using oral history and qualitative data analysis. Through a unit co-developed with a teacher from the school, students interviewed their parents (predominantly immigrants) as well as community members about what home meant to them. Students then went through a scaffolded and collaborative data analysis process to surface what home meant to the class and community. This chapter describes how the results converged on a shared notion of home themed around family, nature, food, dreams, and memories. By delving into five design tools/choices we incorporated in the process, this chapter explores how a deliberative approach to the political was supported by standard design and analysis techniques that are inherently formulated to defy difference. The chapter also reflects on how surfacing commonalities was not enough to alleviate tensions around ethnical, cultural,

and religious differences in the class.

3.1 Introduction

Oral history is the "firsthand testimony of people's experiences of history" [12]. It is recorded around a historical moment of interest (e.g. the occurrence of September 11), but often delves into much earlier and later events in order to "see who the person is and how that person's particular point of view was formed" [12]. Oral history interviewing has been practiced for over three thousand years [286], and its use in research can be credited to anthropologists who have for long applied this practice "to access the experiential knowledge of people living in field sites" [196]. It was then formalized as an archival technique in 1948 by historians at Columbia University recording the memoirs of "Americans who had led significant lives" [344, 286]. Oral history has gained further traction since the 1960s as an approach for conducting qualitative research - the latter emerging vis-à-vis positivism's emphasis on quantitative practices [196, 19].

Oral history is based on transmitting qualitative knowledge through a highly inductive (open-ended) oral interview (or series of interviews) that emphasizes the participants point of views. It diverges from in-depth interviews in that it often covers extensive parts of the interviewee/participant's life and links between them and larger contexts and themes, rather than focusing on a specific topic [196]. And unlike history, which is the study of the past, oral history collection forms a "relationship between the past and the present", that through "placing memory front and centre" in a dialog between the interviewer and interviewee, it creates a "shift from learning about to

learning with" [157]. Today, oral history is applied in a range of fields such as education, anthropology, sociology, history, and critical studies to fill in factual gaps about the past, elicit subjective experiences and marginalized voices, link micro-level experiences to macro societal dynamics, and construct epistemic understandings of cultural terrains through insider perspectives [196].

Oral history collection has also been democratized to broader demographics thanks to the recording capabilities of mobile devices [341]. This democratization expands what oral histories are and can be used for. It also marks the increasing affordances and complexities of the processing, sense making, and narrative construction of the *qualitative data* generated [341]. Handling oral data and the evidence they embody was traditionally preserved for expert historians [343]. But "borrowing" methodological developments from other fields such as qualitative sociology has helped shift oral history analysis to an accepted and widely adopted method of knowledge and theory generation [307]. At the forefront of this is *qualitative analysis*; the iterative process that entails "open ended" and "organic" treatment of the data in systemic ways that leads to emergent findings [58, 380, 174].

The Meaning of Home Project is a 13-week social studies unit we developed and taught at a public school in the vicinity of our campus. In the unit, we fuse the collection of oral histories with the qualitative analysis of their transcripts to create a rapport-building space for grade 7 students around the concept of home. The dialogical and inter-subjective aspects of both praxes seemed promising from our perspective for the highly diverse and transient classroom, where a range of ethnicities, religions, and English proficiencies co-exist, to engage in shared meaning making. We chose "home" as a

topical theme for oral history collection for its relevant and alluring aspects especially that many of the students had experienced frequent social and geographic dislocations. The project leveraged various activities around oral history collection and analysis (eliciting memories and opinions from diverse interviewees, exchanging transcripts, engaging with and negotiating emergent codes, finding patterns) to support students in learning about one another as they learn about other epistemic processes. Pragmatically, we also sought through this project to (1) give students experience with collecting oral history and primary historical materials, (2) expose them to different approaches to dealing with and synthesizing the resulting data, and (3) using oral history transcripts and qualitative data analysis to develop shared narratives about the "Meaning of Home".

The goal of this chapter is to highlight the motivations and execution details of the project, and how they were operationalized to create a common narrative among difference. A large amount of ethnographic data was collected during this project, including audio recordings of all class activities from multiple student groups, videos of the final presentations, notebooks, homework sheets, semi-structured interviews with the teacher and students, and oral histories with student guardians and other community members. This chapter primarily narrates the opening (project set up) and closing (my post-project reflections) "acts" as they speak to this dissertation's methodological operative of approaching the political through design. I will attend in future papers to the rich ethnographic data (which are more learning-science oriented). The chapter sections are organized as follows: section 3.2 starts by reviewing scholarly works on engaging youth with oral history interviewing to support their education, inter-generational interactions, and critical reflection. It also offers a

brief background on the processes of qualitative data analysis, grounded theory and open coding. Section 3.3 situates Meaning of Home relative to Simmel's conceptualization of the "stranger" [325] as a fixed yet transient facet of urban populations, and the use of consensus-oriented deliberations among a public as a strategy to approach difference. Sections 3.4 and 3.5 cover the setup and pedagogical design details of the project, including the activities and artifacts for scaffolding the collection and qualitative analysis of the oral histories. Section 3.6 reports on the project outcomes, including the "performativity" of this approach as far as the political goes, and is followed in section 3.7 by a reflection on five design tools and approaches that support commonality finding. I conclude in section 3.8 with a few arguments about engaging with "raw" oral history recordings, data outliers, and societal difference.

3.2 Related Work

Researchers, activists, and educators are increasingly collaborating with communities, especially marginalised ones or those traditionally excluded from historical accounts, through oral history projects. The collaboration goal is to support communities in rewriting and representing their pasts [373, 307] and to "revise what previous interpreters have seen in their terms, and reshape artifacts and memories accordingly" [208]. Oral histories can be leveraged for more purposes than narrating and reinterpreting past events - including for example to make meaning of the present [46], build rapport across generations [332], and establish counter narratives [197, 264, 104].

The adaptations and archiving of oral histories in community settings have

been shown to help a community "define and explain present conditions according to how it remembers (or wants to remember) the past" [286]. Collective recollection is therefore a means to forage a meaningful narrative of the present [285], and is useful "in illuminating how people relate to aspects of social life" [307]. While rosy reminiscence, nostalgia, and retrospective associations can embellish such oral histories (individual or communal), researchers deem these aspects a valuable "reflection on what has been lost" or overcome [286], and a form of "meaning-creation" [307] rather than as "depositories of facts" [306]. In this section, I describe how researchers have worked specifically with youth around oral histories, and follow it by a review of basic qualitative data analysis principles we applied in this project.

3.2.1 Youth Engagement through Oral History

Engaging youth with oral histories by having them interview, process and curate data with/of (older) adults has been shown in Youth Participatory Action Research (YPAR) contexts to engender rapport and mentorship as the interviewees become invested in helping young people understand and contextualize what is narrated [257, 285, 107, 64]. Anthropologists working with African American youth on collecting oral histories from older community members report on the communication and rapport established across the two generations, and the young serving as record keepers of the community's past [373]. In a context of occupation and conflict, Soliman et al. document Palestinian youth collecting 100 hours of oral histories from their marginalized community around resistance, agriculture, celebrations, traditional tools, and homes [332]. The authors argue that the oral histories (and the videos

produced based on them) are political and epistemic tools that support youth in developing testimonial injustices, preserving their heritage, and emulating the story-telling traditions of the 1940s around protecting Palestinian culture and memory [332]. Analogous to Palestinian storytelling traditions, stories are important in the pedagogical and intellectual praxes of Indigenous people as they offer views of the world, self, and rootedness in geographic places [16, 70, 46]. Brownlie and Crowe have therefore explored contexts for disenfranchised Aboriginal youth in an urban Canadian context to listen to indigenous oral histories of strength and resistance, develop interviewing skills, and gain reflexive knowledge about research ethics (including the research they themselves were participants in) [46]. Working with educational inequity in the South Bronx of New York City, Guishard et al. developed a youth research collective to document the struggles of local women initiatives for educational justice [137]. The youth researchers collaborated with adult researchers to conduct oral history interviews, run focus groups, analyze interview data through coding, and approach the findings through critical frameworks. The authors report on how the youth came to appreciate the struggles of their parents through the interviews, and celebrate the "catalytic energy" that emerges when "multiple generations come together to critique what is, to create what could be, and to produce a Web site ... for organizing future members" [137].

In the classroom, teachers and education researchers are increasingly engaging their students with oral histories and share enthusiastic accounts of its advantages and rewards for youth [176]. That includes learning history in active rather than passive ways, engaging students in research outside the classroom, and seeing multiple perspectives around the same event [310, 276].

Putman and Rommel-Esham examine how elementary school students use oral history gathering and comparative analysis to investigate occupational change over time [276]. Students were able to go from simple knowledge elicitation to deeper analytical levels in both the interviews and in subsequent analysis with Venn diagrams to compare and contrast information from the two time periods. They communicated their findings through essays, posters, newspaper articles, and making slide presentations [276]. Al-Shammari finds that social studies teachers perceive oral history as an effective teaching approach as it cultivates class engagement, supports the students' inter-personal and intellectual development, provides auxiliary learning material, and improves "national values and identity" [11]. Fine et al. explore how oral history collection "by/with/for" young students of color around racism, uprisings, and state violence affords a culturally responsive education for the adolescents and elicits counter narratives against the censored and whitewashed history taught in middle and high schools in the US [104]. Despite the potential of oral history for youth empowerment and "capacity building" [332], several challenges still hinder its wide pedagogical adoption including the lack of funds and equipment, tight semester time lines, student disinterest, and limited teacher training [285]. Sitton et al. explain the latter in that unlike other educational innovations, "the idea of classroom oral history began with practicing teachers in real-world classrooms and, up to this point, has spread largely by word of mouth and example. The oral history project is a grass-roots teaching innovation" [327].

The Meaning of Home Project builds on the explorative, communicative, and meaning-making qualities of engaging youth with oral history as established by other scholars and educators. It also makes three contributions

to the literature. First, this project offers a detailed sequential approach to the pedagogical design, activities, and tools of a social studies unit that (1) is centered around oral history collection and analysis (rather than merely incorporating them as auxiliary techniques) and (2) can be run with limited resources. Second, this project explores how intergenerational accounts of "Home" by guardians can help students *learn about one another* and engage in a commonality-oriented deliberations around it. Lastly, this projects tends to the iterative, collaborative, and negotiative affordances of manual qualitative analysis to support the youth engagement and meaning making of the oral history accounts.

3.2.2 Qualitative Data Analysis

Qualitative research is a nonstatistical inquiry process that has emerged as a reaction to positivism and its emphasis on "strict empiricism" and "objective, value-free, universal knowledge" [220]. The primary goal of qualitative research is to study social phenomena "from the inside" by collecting and analyzing participant observations, in-depth interviews, everyday accounts, oral histories, focus group records, documents, and artefacts among others [108]. The different data collected and analysed allow the researcher to "develop (more or less generalizable) models, typologies, [and] theories as ways of describing and explaining social (or psychological) issues" [108]. McNabb suggests three common strategies for doing qualitative research. The first is explanatory, where the goal is to build theories that explain a phenomenon. The second is interpretative, aimed at understanding a phenomenon that cannot be explained necessarily, so the research derives subjective interpretations of the social events

and actions. The last approach is critical, set to empower and emancipate by exposing harmful and alienating social conditions and motivating a change in individual and group beliefs and actions accordingly [220].

When it comes to the analysis and interpretation of qualitative data, grounded theory is a widely used approach across several disciplines. It allows "the discovery of theory from data systematically obtained from social research" [130]. Analysis begins after relevant data has been collected by coding the data, a key "analytical process through which data are fractured, conceptualized, and integrated to form theory" [68]. Coding typically requires several runs, during/after which coded data are grouped into themes or categories. Codes and categories are iteratively reevaluated as more data are processed. A theory is formed when no more revisions are possible in the codes and categories. Barney Glaser, a sociologist and one of the grounded theory founders, sets two phases for this process. The first phase is open coding, during which the researcher assigns as many codes and at the level of granularity they see fit, in a natural, unconstrained style and with continuous integration and revisions [129]. The second phase, theoretical coding, is focused on rearranging the "groupings" and assigning formal concepts (e.g. from a theory) which link codes and integrate them into a theory [129].

When data is fitted into the emerging structure of codes and categories, commonalities are "compared and contrasted as the analyst weighs possible theories against other possible interpretations. Ultimately, a theory that is "grounded" in the data will emerge from the analysis" [220]. This clustering, or theme-based analysis, is a "key activity in all qualitative data analysis" [220]. It is driven by humans' intrinsic need to "bring order" to data and "look for

and construct patterns out of it" [302]. Focusing on the central themes in a data collection helps "determine common ways an issue or topic is represented (e.g. in media), or explore the way(s) it is "constructed" as an object of interest" [45].

Despite the popularity of qualitative analysis among education and social science researchers [336], there is almost no literature on teaching qualitative data analysis and grounded theory to youth. In the context of YPAR, Foster-Fishman et al. assert that "engaging youth in meaning extraction through data analysis is an essential, though often forgotten, step in YPAR" [110]. The most relevant work here is Caraballo and Lyiscott's account of teaching critical qualitative research in a YPAR project [56, 214]. But their focus is on developing research agendas with youth rather than engaging in qualitative analysis. Similarly, Marciano and Beymer report on an after-school program where youth conducted collaborative research activities by developing research questions and collecting interviews, surveys, and focus group. The youth then analyzed the data by discussing what they collected in small-groups, and built on discussions and reflections to revisit their research questions and collect additional data [214].

In *Meaning of Home*, the tenet pedagogical subject matters are qualitative data collection and (interpretive) qualitative analysis. I detail both approaches in this chapter, including how we taught and applied open coding in the classroom to generate a concept of home *grounded* in the participants' oral histories and the socio-spatial aspects of their narratives. I describe how we emphasized coding and categorizing in this project as the primary means to extrapolate a "broad view of the data" [220] and find reoccurring themes and how we synthesized "manual" findings with computational ones. This work

therefore contributes many pedagogical strategies and research insights given the under-explored nature of this topic.

3.3 Home, Difference, and the Stranger

Public schools, offices, markets, and streets in the city are places where we are "in the presence of otherness" [318]. This otherness stems from a multiplicity of differences around "race, language, religion, standards of living, customs, cultural traditions, and ideals of government and moral conduct" [378]. Sociologist Georg Simmel characterizes how modern migratory trends fuel difference in cities through the emergence of *the stranger*. The stranger is not Stanley Milgram's "familiar stranger" whom one regularly observes in the shared urban environment but not interact with [224, 262]. And is not "the wanderer who comes today and leaves tomorrow" [325]. Rather, Simmel's stranger "comes today and stays tomorrow", participates as a member of the dominant group, but remains distant from its members since they were not a member from the start and may cease to be one at any point [325]. The stranger is fixed within a geographic space but they bring qualities "into it that are not, and cannot be, indigenous to it" [325]. Despite being an active participant in society, the stranger does not hold deep relationships with that society's members because what is shared with them: occupation, nationality, or social position, are general and generic. In other words, "the stranger is perceived as being in the group but not of the group" [378].

The stranger has historically been the trader, but the types and perceptions of the stranger have increased. Today, immigrants, expat workers, visiting

talents, and international students can all be considered strangers by Simmel's definition. They are fixed aspects of contemporary cities and accentuate the various types of relationships found within them. But the stranger does not become "a full partaker in the life of the city until he has been included in the intimate relationships of at least one, if not more, of its groups. Until then he remains a stranger" [378]. Establishing intimate associations is not easy given the blasé attitude cities cultivate [375] and the tendency of urban social structures to make their subjects appear "uniform", "unimportant", and "submerged in the crowd" [378, 375]. Another factor involved in cementing strangerhood is how society views the stranger: it could be as a figure who differs so greatly that they cannot be lived with, or as a brother with whom "fraternal connection" is felt [320]. The most common view of the stranger in the West though is that of a *neighbor*, where one turns towards them but is inclined to turn away, indifferent, because you ultimately cannot "fathom them" [320].

The neighbor-stranger view folds in it two idiosyncrasies. The first is the general discomfort (and overwhelm) with the complexities of approaching/understanding/co-existing with strangers, which further promotes mental laziness around "discerning the particularity of" a stranger, e.g. "a black man or Muslim woman" [320]. The second is how strangerhood threatens the "phantasmatic" vision of home as a space of safety and withdrawal from the pandemonium of the *political* [160]. Humans have an ever-present longing for a home (be it in physical structures, objects, or conflict-free societies) due to our innate fear of the unknown, dilemmatic, or conflictual [160]. This is why architecture from early times has promised "protection from time's terror. To feel sheltered is to have banished feelings of vulnerability and mortality" [111]. We design and build structures that keep the hubbub of the outside

world out and evoke feelings of safety and seamless comfort by "the fire burning deep in the solid masonry of the house itself" [381]. The French philosopher Gaston Bachelard writes: "life begins well, it begins enclosed, protected, all warm in the bosom of the house" [22]. These artful enclosures can capture idealized pasts before they flee because "something closed must retain our memories", thus preserving whiffs of untroubled times. Intermeshed with this stability are "fixations of happiness" where we find security despite knowing the fundamental precariousness of our existence [22]. When a differentiated other comes (e.g. an immigrant), they act by virtue of their difference as a "tumultuous disorder" that threatens to break away this image of home. This potential turbulence threatens identities, beliefs, and genealogies and exposes their vulnerability to being destabilized, discontinued or unmade. The turbulence of difference is projected back to further estranges the stranger.

Political theorist Bonnie Honig argues that democratic empowerment is only attained by giving up *the ideological place called home* to affirm the risks and the irreducibility of difference, dilemmas, and conflict for the sake and promise of social democratic struggle [160]. Urban sociologist Richard Sennett analogously puts forth that we develop psychologically and ethically by abandoning the comforts of home. We can learn that from immigrants, as they are "forced into fresh experience due to displacement", so they learn to navigate their new realities by becoming "skillful flaneurs" while trying to retain a glimpse of home and memories [320]. The dominant (non-stranger) group is ought to do the same: navigating difference in the environment, searching for "primal warmth, intimacy and insideness", and growing by encountering complexities and differences. In essence, Honig tell us to abolish the notion of a home, and Sennett shows us how to pragmatically leverage that by learning from

immigrants [320].

In this project, we link "home" and the "political" in the context of an urban and ethnically diverse seventh grade classroom where many of the students are recent immigrants or expats. Despite students living in the same community, many do not get sufficient chance to be "included in the intimate relationships" of the class and become "of the group" [378]. We conflate home and the political here not by abandoning the notion of home though. Rather, it is by using "home" as an issue that matters to a *public* to surface (1) what came before the shared now (which is riven with difference), (2) how we make a place home, and (3) the commonalities that help us settle with a shared home with the dominant and the neighbors-strangers.¹ In orchestrating this, we are inspired by the public deliberations approach put forth by Habermas [144], Phillips [265], Wolin [376], Kymlicka [187], and Mansbridge [213] explored in the previous chapter, which hinges on the idea that "a free society composed of diversities can nonetheless enjoy moments of commonality when, through public deliberations, collective power is used to promote or protect the well-being of a collectivity" [376]. The Meaning of Home Project is further motivated by storytelling as one of the plurative communication strategies Iris Marion Young proposes. Stories can support a common understanding of the issues at hand by articulating experiences from certain othered, social, historical, cultural or geographic positions. Through narrative, "the outsiders may come to understand why the insiders value what they value and why they have

¹The term "neighbor" here is befitting in two ways. The first is in how Sennett uses it as a way to view the "stranger" - which this classroom had many of. The second is in that most of the students were in fact neighbors, living in a small range of residential buildings in the neighborhood. We too were their neighbors as my advisor and I both lived in that community at the time. Further, our new campus was established in that community a few months before the start of this project, and we were negotiating ways to meet and know our new neighbors (more on that in chapter 4).

the priorities they have" [384]. Lastly, in designing this project to also include intergenerational oral histories, the students can "access the socially constructed reflective thoughts" of their guardians (who are strangers too). This access "not only accounts of their life experiences, but also how and why they have lived their life in the way that they have, and the thoughts and ideas that have guided their everyday" [261], including how to make a place home as they navigate massive social dislocations. This can further create a social construction of home that cuts across individuals' experience [323], and a reason and a context to "fathom" the neighbors-strangers.

3.4 Background and Project Setup

Our campus is located on a small residential island within a major American city. A large number of immigrant and expatriate families live on the island due to its affordable rent options (gentrification is rapidly changing that though) or for its proximity to their work location (a large international organization). The island has a public school with grades pre-K to eight, and is a 10 minute walk from our campus. In the fall of 2017, my advisor met with the school administration and teachers to explore research collaborations around mapping and oral histories. The social studies teacher, anonymized as Mr. Finn, expressed interest in collaborating with our lab.

As a general research problem to jump-start the collaboration, the teacher noted that the school's student body is both ethnically diverse, which is common for public schools in our area, and transient given that many international students enroll or leave at any point during the semester due to

their guardians' shifting work placements. Diversity and transiency made it harder for students to find deep connections with their classmates. The teacher was therefore seeking pathways for upper year students (seventh and eighth graders) to work through the multitude of ethnicities, religions, and English proficiencies present among them and engender a sense of rapport. His hunch was that the students already shared many commonalities that they just needed ways to become attuned to them.

My advisor (the PI on the project) was interested in working with youth on data collection, analysis, and dissemination around oral histories. Mr. Finn had worked as a museum historian before becoming a social studies teacher, and he too was interested in oral history as a potential practice for his students to learn and apply. At the time, I was wrapping up a 4-year research project on homes and diaspora. My work had examined how refugees build and customize their homes in camps [298], how camp youth prototype "dream" homes that transcend contextual limitations [296], and how design activities around the concept of "home" support reminiscence and past reclamation among immigrants [294]. As it was my first time living away from family, I was also grappling with how to make the campus and city I have just moved to for doctoral studies feel like home. Home, in a broad ontological sense, was therefore a topic of personal and intellectual interest to me. The project eventually launched around three themes: home, oral history, and finding commonalities.

3.4.1 Pedagogical Design

In October, 2017, we started to meet with Mr. Finn at his classroom during the prep (8:00 am) period on a bi-weekly basis. The three of us (the project team) moved to weekly meetings in early 2018 to prepare for launching the unit in March 2018. Early meetings focused on introductions, getting to know his pedagogical interests, laying out the requirements of the Department of Education and other places, and mapping out possible intersections between our skills and interests. After two months of meetings, we converged on the idea of a unit in which students collect and *iteratively code* [303] oral histories around the meaning of home as a way to surface commonalities among them. Through data collection, analysis, and synthesis, youth could also explore two questions: *what does the word home mean to them: a space, a memory, a group of people?* And if they had the chance, *what kind of home would they like to create?*

For both scheduling purposes and curriculum fit, we designed the unit for 701 - the (singular) grade seven section at the school - using the following guides:

- **Working from a Common Stratum:** Searching for a home or making a context feel like home is a common and instinctive human pursuit [160]. Mr. Finn's students were adolescents at the stage of exploring and reinventing themselves and their worlds. We therefore chose "Meaning of Home" as a theme for the unit since students could find ways to relate to the concept or start to critically think about it. We also felt that this theme was a good way for new and expat students to bring stories of homes elsewhere while still contributing to a common narrative.

- **Expert Knowledge Transfer:** We wanted students to learn and apply the same skills we use in our research such as oral history collection, iterative coding, and computational analysis. The unit therefore focused on practical applications that we scaled down and scaffolded with various assignments and artefacts.
- **Intergenerational Interactions:** Analogous to our lab's commitment to community-based work [300, 299, 358], Mr. Finn wanted to enrich his students' interactions with their guardians and other community members. We therefore incorporated oral history interviews with guardians and community members, and structured the primary analysis around the guardians' corpus. We saw that engagement with guardians could afford students a reflexive understanding of the contexts they called home since "the passage of time enables people to make sense out of earlier events in their lives", and actions "take on new significance depending on their later consequences" [286]. Further, if students could find commonalities among their guardians (predominantly immigrants) at the class level, then what they share is even deeper and intergenerational. As for community engagement, we included a class field trip to the long-term public hospital for students to conduct oral history interviews with some of the residents.
- **Repeated Exposure and Practice:** Following from the previous points, we wanted students to become young experts on the topics they were learning through repeated practice. As such, we had students interview each other during class, interview a guardian, interview a community member, and listen and do light processing on all three interviews. This way, they got to practise collecting and listening to oral histories multiple times in different

contexts within the span of few weeks. We followed a similar model with coding and computational analysis.

3.4.2 Instagram Explorations

During unit planning in December 2017, I wanted to get a sense of what home meant to others to help scope the oral history protocol questions. I therefore queried 5000 Instagram captions that contained the hashtag "home", and did the same for relevant terms such as "myhome", "myhouse", and "home" (in Arabic²), among others. Once hashtags were retrieved and filtered, I generated a co-appearance graph with the networkx Python library. The connected hashtags were then processed in Gephi (a graph visualization and analysis tool) using Modularity analysis which breaks the network into clusters where nodes have dense connections within the cluster but sparse across them (Appendix B.1).

As illustrated in Appendix B.1 - Figure B.1, the hashtags co-occurring most often with the "home" hashtag were related to home decor, love (in the context of winter/cooking, given the time of the year), aesthetics, and then family. Exploring the same hashtag with the possessive pronoun led to more diffused results, with the predominant clusters being home decor and interior design (Appendix B.1 - Figure B.2). Other relevant themes were "myhomevibe", "myhousethismonth", and "homeobsessed", which associate "home" on Instagram with promoting, showcasing, and sharing decor ideas. Lastly, the word *bayt* in Arabic means both home and poetry verse. Most results for quering "home" in Arabic related to poetry, then real-estate and

²Mr. Finn indicated that many 701 students were Arab ESL (English as a Second Language) learners. So I wanted to explore if the Arabic hashtags around home shed any extra or different insights that could be useful for the students given my fluency in the language

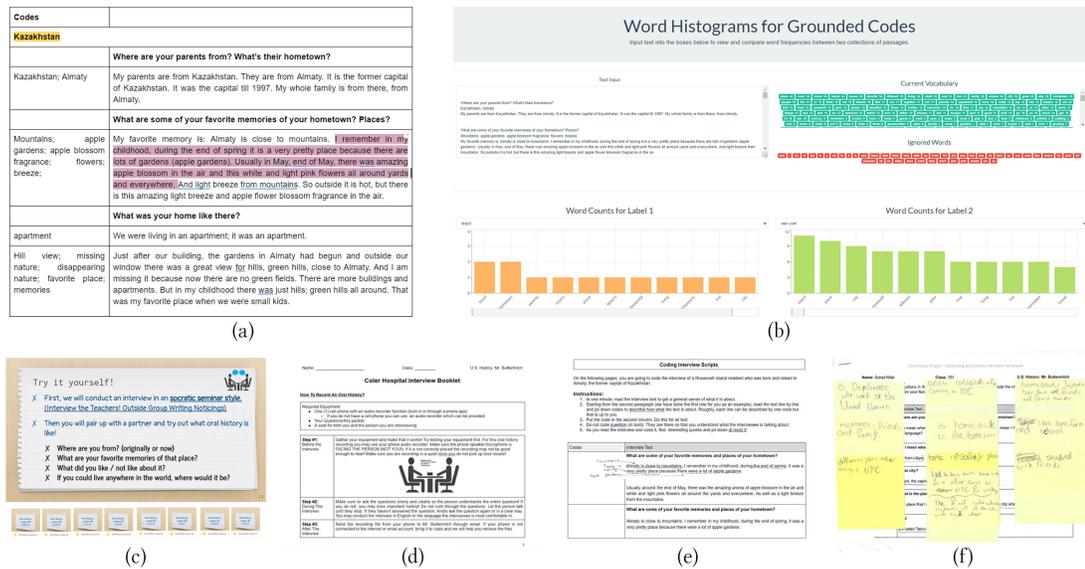


Figure 3.2: Unit Artefacts: (a) Transcript coding template for use with (b) the Word Histograms for Grounded Codes (WHiGC), (c) teaching slides, (d) oral history interview packet, (e) homework transcript coding packet, and (f) in-class coding packet

country names such as Saudi, Kuwait, Dubai, and others (Appendix B.1 - Figure B.3). The country cluster is expected given the strong sense of patriotism associated with homelands in that region. While this exploration around a different language did not end up informing the the oral history protocol design, language in general has played a vital role as discussed later.

3.4.3 Pilot Run

Following from Instagram findings, we wanted to design an oral history protocol (which is the core component of the unit), that moves away from literal/decorative/patriotic ascriptions of home. We therefore devised the questions to focus on memories, meaning making, and critical reflections. In February 2018, Mr. Finn tested a pilot version of the protocol (Appendix B.2)

with a group of students from grade eight as bonus homework. Ten students interviewed their parents and one interviewed their grandparent. We ran this pilot to: 1) gauge the expected length of interviews, 2) determine if the resulting transcripts were doable for students to code, and 3) design a coding format that can be directly copied and pasted to the Word Histograms for Grounded Codes (WHiGC) tool we were building for this project (section 3.5.4).

Once students submitted the pilot interview recordings, we listened to them individually. I also transcribed the interviews instead of using a transcription service - a decision that will impact how I later reflect on this project as a whole in section 3.7.3. In a Google Doc, I put the transcripts in a two-column table (one for the codes, one for the text), and broke long answers into multiple rows so that each row corresponded to one theme (and therefore a cohesive set of codes). I then coded the transcripts, highlighted interesting quotes, and took notes (Figure 3.2-a).

In terms of insights arising from the pilot, the interviewee responses were generally short enough that for the most part that they did not need to be broken into separate cells. The transcripts however contained a plethora of city names, countries, and places, housing components, housing types, and living arrangements (extended family, nuclear family). We discussed several pragmatic aspects that came out of this, such as whether students should code cities and places specifically or generically (i.e. "place name"). We reckoned that specific codes would work well with the WHiGC tool (Figure 3.2-b) to find which words occur frequently in relation to a city or place. Further, we made the protocol shorter and changed the phrasing of questions so that "home" became "hometown" instead, as the latter in our opinion seemed more encompassing

Week Number and Topic	Details
1 What is Oral History?	Basics and oral history examples, project introduction
2 Skills to Interview	How to perform interviews, how to obtain consent and why How to follow up and seek clarifications Semi structured interviews
3 Recording with Mobile Phones	Interview recording basics Using a mobile phone for recording Task: Practicing recording in student groups HW: Interview your guardian about the meaning of home
4-7 Qualitative Analysis	The importance of data coding and analysis Modeling open coding on a generated 701 transcript HW: Qualitative coding on own transcript
8-9 Computational Analysis	Using WHiGC to find patterns and themes Google N-grams and Trends Computational vs. manual analysis
10-11 Putting it Together	Creating a presentation: "What Does Home Mean to Us?"
12 Summarizing	Literacy skills summary Unit recap: What makes A Place A Home?

Table 3.1: Meaning of Home Syllabus

and might elicit richer responses. I reflect on this last decision, made quickly and without too much consideration, in section 3.7.5. With that, we were ready to start the unit with class 701.

3.5 The Meaning of Home Oral History Unit

Our 3-member project team launched the unit in March 2018 and co-taught the class for two periods on Fridays until the final student presentations in June 2018. We met on Thursdays during the 8:00am prep period to set up for the next day and discuss material for the following week. Mr. Finn did most of the teaching, but my advisor and I taught the parts we were well acquainted with such as obtaining consent, qualitative coding, and computational analysis. Below, I describe the four primary parts of the unit:

3.5.1 Teaching

The unit covered the following topics in-order: oral history basics, semi-structured interviewing skills, recording on mobile phones, transcript coding, thematic extraction, computational text analysis, and computational vs. manual analysis (Table 3.1). The culmination was group presentations on "What Home Means to 701". We collaboratively developed the material slides using the template Mr. Finn used for teaching (Figure 3.2-c). During weekly meetings, the teacher gave feedback on the content we added to ensure that it meets the ministry standards of practice for teaching. This includes for example ensuring that class activities do not last too long, oscillating between writing, listening, and discussion to prevent fatigue and maintain student engagement. In-class teaching activities included listening and learning from oral history interviews from YouTube, Stop and Jot/Turn and Talk about concepts taught or homework assigned, and doing Socratic circle discussions, among others. Except for guardian and hospital interviews, all the unit activities took place at the school.

We designed multiple paper packets that students used for homework and class activities. This included an oral history interview packet (Figure 3.2-d), containing reminder information on setup and recording, consent, and the interview protocol. Each interview question in the kit had white space below it to transcribe answers or write notes, and to indicate the timestamp of the question for easy retrieval later on during analysis. Students referred to the packet when interviewing their guardians and we handed them a similar packet during the hospital field trip. Another paper packet we designed was for open coding (Figure 3.2-e), which included the transcribed guardian interview for

each student with space for coding on the left. We provided similar but slightly modified transcript packets for students to exchange with their classmates, who each did a round of coding on one transcript that was not their own (Figure 3.2-f).

3.5.2 Oral History Interviewing

There are multiple ways to approach oral history collection, including photo elicitation, memory mapping, life reviews, and walking interviews [157, 285]. In this project, we performed *life story interviews*, which focus on the chronological unfolding of events [157]. Our protocol (Appendix B.3) zoomed in on two frames of reference in the interviewee's life: the places, memories, and events associated with their hometown, and then those associated with where they live now.

We spent the first three weeks of the unit (6 periods in total) on how to listen to and conduct oral history interviews. Our teaching and feedback emphasized the reciprocity of the interview process and the "shared authority" [114] among the two parties in directing the course of knowledge extraction. We also covered attentive listening, how to elicit more information, and how to guide the conversation back to the main topic. In the third week, students brought their phones (after obtaining the necessary school permissions) and practiced interviewing each other on a topic of their choice. After that, they had a few days to interview their guardians at home and share the recordings with us through the class cloud drive - a process we had rehearsed in class. In week 9, we took a field trip to the long term care facility on the island (a five

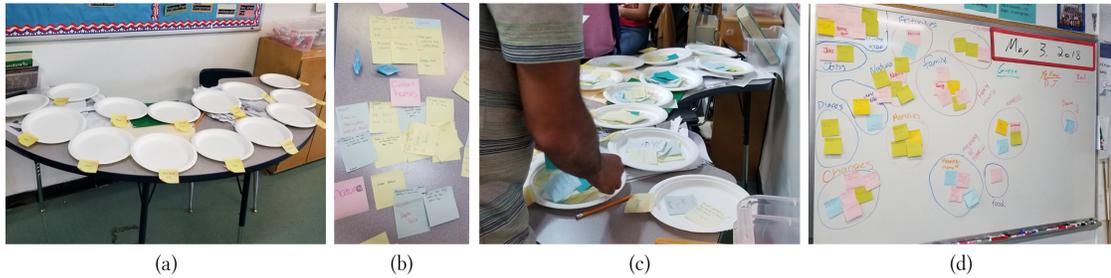


Figure 3.3: Categorization activities: (a) Category "plates" generated by the project team, (b) students categorizing transcript codes in groups, (c) groups distributing their codes across category plates, and (d) affinity diagrams for the final class-level categories

minute walk from the school) where groups of students conducted interviews with the residents (Figure 3.1).

Interviewees had to sign an oral history interview release form. In both cases (at home, in the hospital), students administered the consent process we covered in class (they were also familiar with it from the assent/consent process they went through for the project). Through other collaborations with the hospital residents, we knew they were interested in recording oral histories. But in the case that a guardian did not want to sign the release form, was not comfortable with an oral interview, or was not available, students had the choice to interview a different guardian/family member/community member, or submit a written interview. The oral history homework with guardians resulted in 23 oral interviews and 3 text interviews, and they ranged in length from 2 to 16 minutes. As with the pilot, I transcribed the interviews, arranged each transcript into tables, split the responses to some questions into separate rows if they were too long or covered multiple themes, and prepared a coding packet for each student (Figure 3.2-e).

3.5.3 Coding and Categorizing

The goal of coding the transcripts and building themes was to help students move from data collection to analysis, detect patterns across the data, and deliberate a collective notion of home from the class. We introduced coding to students as "an interpretive, heuristic, and exploratory process" [290] for summarizing and condensing data. We did a live example in class on one of the pilot transcripts using both *descriptive coding* (codes that summarize the excerpt) and *in vivo coding* (codes quoted directly from the excerpt) [303]. We also provided a list of what codes can capture such as actions (e.g. lining up for lunch), activities (e.g. living one day at a time, concerned with unhealthy diet), concepts (e.g. racial diversity, sense of self worth), differences (e.g. conflicting cultural norms), opinions (e.g. smiling is more important than wearing fancy clothes), and processes (e.g. melting ice caps). Finally, we emphasized that coding is a creative and interpretive process that there are no right or wrong codes as long as they stay true to the transcript.

After some practice in class, students coded their transcripts as homework using the packets provided. If they needed more than one code per row, they used arrows to indicate which sentence(s) each code was referring to. To emulate the iterative and reflexive coding used in qualitative research, each student had to also code the transcript of a classmate and reflect on how that was different from coding their own. The following week, students received the transcripts of their classmates, did the coding in class, and we reflected on the process. Students then got their transcripts as coded by a classmate, went through the codes, and revised their codes accordingly (i.e. second cycle coding). Students then wrote the final codes on post-its, attached them to the

coding packet, and submitted them to us.

We brought back the transcript packets (with code post-its) to our lab, and went through all of them to generate category plates (Figure 3.3-a). The following week, we went from codes to categories. Students in groups of 3 to 5 consolidated their codes first, combining similar ones, and generating categories to classify the codes (Figure 3.3-b). During the activity, groups practiced telling stories using codes only. We asked everyone then to choose representative codes from their groups and put them in the appropriate category plates (Figure 3.3-c). Lastly, we went through the post-its in each plate and sketched the final categories on the whiteboard through affinity diagramming (Figure 3.3-d). The result was to go from two hours and twenty minutes of audio transcripts to 10 categories, which will be described in section 3.6.

3.5.4 Computational Analysis

Professor Alexandra Schofield (who was a Cornell PhD student in Computer Science at the time) and Professor David Mimno helped us build WHiGC [312], a tool to teach students the affordances and limitations of computational text analysis in comparison to manual coding. The tool (Figure 3.2-b) takes as input the two-column code-transcript tables (Figure 3.2-a), which can be copied and pasted into the "Text-Input" box. When the text is pasted, a histogram of its word frequencies appear on the screen. The "Current Vocabulary" pane lists all words in the corpus; clicking on any of vocabulary words adds it to the "Ignored Words" pane and removes it from all histograms. Clicking on an ignored word puts it back into the vocabulary and histograms. This "stop word" feature is for

students to learn about removing words that are commonly used in English (e.g. determiners and prepositions) which may not contribute to the analysis. Since the input has the codes associated with the transcripts, the tool also displays word frequencies of the excerpts associated with up to two codes to allow for comparison. WHiGC was built in Java Script based on Mallet (the MACHine Learning for Language Toolkit)[218] and hosted on the Heroku Platform [155] so that students can access and run it from a URL.

In addition to our tool, we tested Google Ngram viewer (which displays word frequencies from a large corpus of books) and Google Trends (which analyzes the popularity of top search queries). The goal of this computational text analysis was to reflect on insights that could emerge from word counts, how word counts are different or similar to manual coding, in what ways frequent words relate to categories, and what does each approach say about what home means to the class. Collectively, the four parts of the unit (teaching, oral history interviewing, coding and categorizing, and computational analysis) focused on approaching difference through consensus-oriented deliberations by 1) collecting a range of interviews, 2) exposing students to different ways of dealing with qualitative data, and 3) fostering collaborative synthesis and sense-making through the different approaches we tried.

3.6 Project Outcomes

After a few iterations of group and class level affinity-diagramming on the transcript codes, we converged on the following common categories across the Meaning of Home interviews: family, memories, nature, change, activities,

Category	Manual Coding Outcomes		WHiGC Outcomes	
	Number of Codes	Codes on Meaning of Home	Common Words	Frequency
hometown*	39	"where you never feel alone"	room	36
family	30	"a space with family"	house	32
memories	27	"a place where it is safe"	family	20
likes and dislikes	18	"where she is safe and family [sic]"	city	20
places	17	"where family is and happiness"	country	20
change	16	"synonymous to family"	people	15
activities	15	"place as kind of a new beginning"	friends	18
meaning of home	10	"studying and working hard"	together	17
nature	8	"my family traditions, culture, food and family values"	parents	16

Table 3.2: Resulting categories and common words. *This category has the largest number of codes because city and town names, spanning 11 countries, cannot be consolidated. But this category was not as thematically prevalent as others such as "family" and "memories"

places, likes and dislikes, meaning of home, and hometown (Table 3.2 Columns 1 & 2). In terms of WHiGC outcomes, once we remove determiners, prepositions, and words repeated in the interview protocol (e.g. place, home, island), the most common words appearing in the interviewee responses relate to family, relationships, and places (Table 3.2 Columns 4 & 5). Once data analysis at the class level was done, the final project deliverable was for students (in groups of 3) to choose one of the categories, and narrate what it means to 701 in the context of home. Students were required to refer to transcript codes as well as cite relevant quotations from at least three classmates' interviews from outside their groups. This was yet another opportunity we wanted to seize to help them learn about one another and their guardians. To simplify code retrievals, I scanned the codes we categorized in class and put them in separate pdfs (one for each category). All transcripts, scanned codes, and WHiGC-compatible data were made available on the classroom cloud drive. We also encouraged students to use images, maps, and WHiGC histograms as evidence.

Overall, the qualitative and quantitative data converge on a highly relational notion of home as reflected by the large cluster of codes on "family" and

"memories", the commonality of words related to them (family, people, friends, together, and parents), and the codes and quotations students gathered on what home meant to the interviewees (Table 3.2 - Column 3). In the final presentations, the presenting groups recognized that *"our class is an international class"* (g1) and *"every single person has their own meaning of home"* (g2). However, *"a lot of 701 families had their meaning in common. For most families home was about emotions rather than the place in particular"* (g1). Further, guardians *"all give different memories but still have a similar thing which is the same meaning of home"* (g2). During the presentations and followup discussions, students were explicit about the code and quotation sources (e.g. student x's interview, student y's mom, student z's dad, student r's hometown, etc.). This eloquently highlighted the "multiple voices but one public" aspects of the project by creating a cohesive narrative that packed a plethora of subjects, memories, stories, hometowns, and dreams in 90 minutes on the last day. It celebrated learning *"a lot about our friends and where they are from ... also learning about our parents and other people's parents"* (g3). As another group put it, *"we learned from our oral history interviews, codes and categories that class 701 had many things in common... they are all connected in a meaningful way"* (g6). Some students also incorporated photos of their families in relation to the categories they presented on, which added to the plurality and richness of the stories. Collectively, the engagement with oral histories and their analyses helped in "discerning the particularity of" a stranger [320].

These findings reify the goals outlined in the project motivation and set up, which is to help the students (many who are neighbors-strangers) learn about one another and find commonalities deeper than the surface-level differences. Perhaps the ultimate commonality emerging from this unit is that whether a guardian/community member grew up in Dhaka, Bangladesh or in Brooklyn,

NYC, home meant the same thing to them: being with family, having good times and making memories with friends, relaxing in nature, and working hard to obtain education. Nature was a (surprisingly) prevalent theme in the interviews, with students finding that many of their parents commonly citing one park in our city as a reminder of their hometowns. I am compelled to believe that Habermas, Young, Mansbridge, Sennett, and Dewey would have been enthused over the communicative and pluralistic social performance taking place in 701 presentations, the multiple international and intergenerational voices it brought together, the dialogical references to both difference and commonalities, and the joint identity Meaning of Home has brought to the class.

3.6.1 Reflecting on the Outcomes

The Meaning of Home Project can be considered a success on multiple levels: Mr. Finn kept emphasizing that this was the most fulfilling (and symmetrical) research collaboration he has ever done. He continued offering the unit even after the research project ended (until the pandemic interrupted him). Students were excited about the converging codes and their growing comfort with conducting oral history interviews. Some students continued to work with us on the subsequent CivicDIY [299], and they still ask (to date) if we could offer both programs again. And throughout the project, my advisor and I were inspired, excited, challenged, and gratified.

But it is worth pegging these outcomes in relation to the original motivation of the project, which is to engender a sense of rapport by surfacing commonalities among the students/neighbors/strangers. From my vantage

point as the primary field researcher observing closely at the back of the class, i.e. "submerged in the crowd" [378], surfacing a joint meaning of home changed nothing about the "blasé-ness" associated with the neighbor-stranger view. Students for example were still making fun of ESL-learners mispronouncing words (e.g. confusing diary and dairy), calling someone's headscarf a "Halloween Costume", and picking on those who exhibited a great deal of formality in their interactions (an Eastern cultural characteristic). I recall an activity through which we wanted to teach students about the time and effort that go into transcribing oral histories. We played excerpts from two interviews at normal speed, asked students to transcribe them, and then counted inaccuracies. When Mr. Finn played the first interview excerpt (by a non-native English speaker with a visible but clear accent), students expectedly could not keep up with the speech space. Perhaps not aware that the real cause is the speed, some students turned to each other (almost as a natural reflex) and whispered *"it's her accent, it's her accent"*. Ironically, the class transcription performance and accuracy was lower in the second transcription activity - even though the speaker was a native English speaker. That is when and where I realized that many differences are entrenched too deeply to be mended or bridged through commonalities.

Admittedly, my own positionality as an immigrant/headscarf-wearing Muslim/non-native English speaker has perhaps (over?) sensitized me to pick up these minute dynamics, which signal (to me at least) that the fissures we tried to indirectly mend by surfacing commonalities have not been dislodged. The strangers remained strangers and the dominant group still looked at them as neighbors despite the newfound knowledge that they all (and their guardians) share common notions of home. Put differently, finding a common notion of

home could not ameliorate the fact that the "qualities" some students and their guardians have "are not, and cannot be" indigenous to the urban scapes we all share even when there are other binding factors [325]. Of course we cannot ignore the institutional context of the school where we ran the project, and the limitations this imposed in terms of time, space and *discipline* (which is why so many of the "aside" comments were only heard at the back of the room). Or that our approach to difference in this project is emblematic of Western liberal democracies which pervasively seek consensus and sideline difference (a fact I only discovered two years post *Meaning of Home* once I became more literate in political philosophy). So my remarks are not a critique or "this project ought to be"; they are instead a reflection of what finding commonalities among difference can do (e.g. keep our societies running, produce an exhilarating facade of consensus) and cannot do (engender sufficient rapport or full justice).

A major take away from the project outcomes and reflections is that finding commonalities across difference is less involved than engaging with it in the first place. In hindsight, 701 youth already had a lot in common: going to the same school, living in the same neighborhood, playing video games together, and consuming the same pop culture. Given that the youth shared social environments, age group, and interests, we could have easily found ways to identify and dwell on the commonalities they share. This brings us to an core argument this dissertation makes, which is that *approaching* difference by finding commonalities is potentially easier (more straightforward, less laborious, less emotionally taxing, more logistically feasible etc.) in comparison to *engaging* with difference in more enmeshed or confrontative ways. As chapter 4 depicts in detail, a care-based approach to difference for example requires time, a lot of "invisible" work, thoughtful interactions, and compromises

from the sides involved. In chapter 5, we see how a direct confrontation with difference can raise conflict, sobering realizations, and residual feelings; it can sabotage the very stage where we deliver our *social performances* [131] on. In the Meaning of Home Project, the process of finding commonalities went in a relatively smooth and linear manner, it was amiable for prediction and scaffolding with tools and methods, and it got us the results we hoped for. I therefore contend that *it is always possible to identify commonalities among 701 youth, their guardians, or other groups that share an urban context.*³ The real challenge is how to approach those differences in more confrontative and involved ways to support truly equitable and pluralist societies.

3.7 Defying Difference by Design

In this last section of the chapter, I reflect on five tools and approaches that readily and seamlessly supported finding commonalities in this project because they are inherently designed to defy difference and foreground commonalities. Human life is riven with differences, which modern thought, democratic models, and design norms (e.g. the use of personas) often seek to eliminate or sideline upon encountering. Generally, difference attracts eradication attempts because it threatens salient identities and beliefs, posits a destructive blow to stable genealogies, and carries winds of deprivation and exclusion if the other takes over the resources of the collectivity [324, 320, 160]. Difference is also hard to package and standardize, so it is less frequently valuable from an empirical stance and not profitable for capitalist purposes. Humans' natural aversion to

³An example is the easy answer to the question: do immigrant and non-immigrant Canadians share any commonalities? Yes - they are all nice and enjoy Tim Hortons!

difference could partially explain why we were able in *Meaning of Home* to find commonalities among difference in smoother and more straightforward ways⁴ - specially in comparison with the other approaches examined in this dissertation such as care [300] and engaging in conflict [299]. Lastly, normative design and data analysis practices are already biased towards producing commonalities by defying and marginalizing difference, so they made our job in this project slightly easier. I outline below five tools and approaches for eliciting commonalities that we used in *Meaning of Home* either deliberately or out of habit:

3.7.1 Instagram Co-Occurrence Graphs

My immediate/subconscious/natural entry into the project was to explore what *a lot of* people associated *most frequently* and *most generally* with "home". The results were the Instagram co-occurrence graphs discussed in section 3.4.2. I would have liked to query one million captions per hashtag, but could not due to the computational limits of my machine. I therefore settled for analyzing 5000 captions for each hashtag ("home", "myhome", etc). The resulting Gephi graphs (Appendix B.1) make it easy to read the hashtags *most commonly* associated with "home" as the node and font sizes are proportional to the frequencies of their associated hashtags. Reading the outlier/less common hashtags is hard unless you zoom in very closely and wait for the heavy graph to load all the smaller nodes. This first strategy we used in this project therefore builds on the readily available affordances of semantic/co-occurrence networks as a standard approach to analyze big chunks of data and foreground the frequent themes and

⁴We also cannot forget Mr. Finn's masterful orchestration of the classroom

topics [315].

3.7.2 Frequency Histograms

In the two months of back and forth conversations around designing and testing WHiGC, our default/subconscious/obvious approach was to order the transcripts corpus word frequencies (and the comparative frequencies associated with two codes histograms) in descending order (Figure 3.4). After we collected all the guardians oral histories, Mr. Finn created a histogram of the guardians' home countries ordered from the most frequent to the least frequent (Figure 3.4). In the writing of this chapter, I ordered data in Table 3.2 also in descending order to show which codes and words were the most common/significant. It is often the case that "the importance of a term" increases "with the number of times that term occurs" [271], which is why we focus on it and the common "big picture" narrative it tells. This focus on frequencies abstracts away most of the complexity and nuances in the data, focusing in on a particular set of indicators that correlate to the topic of interest. Or it makes it cumbersome to access them. For example, you could scroll right in WHiGC to get the words with less frequencies, but it's "clanky" and not the default picture we see every time it is run. The development of data networks, sophisticated aggregation models, and massive scale computing reify the focus on frequencies (i.e. commonalities). It has become almost hard and archaic to not leverage these tools, especially for us in computing and information sciences. The results, akin to semantic network analyses, is a nice and computationally supported picture of the commonalities.

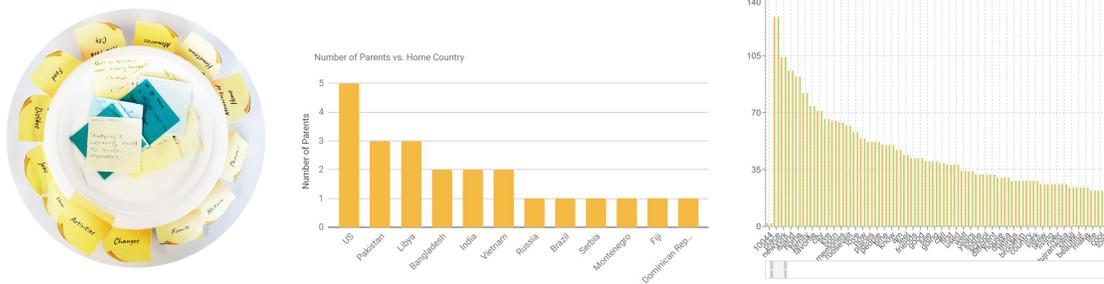


Figure 3.4: Commonality-oriented strategies: Category plates, 701 guardians’ home country histogram, and WHiGC word frequency histogram computed from the class transcripts corpus

3.7.3 Text Transcripts

One of the pivotal design decisions we made before the unit launched was to convert the oral interviews students were going to collect to text transcripts. This common approach to oral data served multiple pragmatic purposes such as providing the necessary text input for WHiGC, simplifying the coding process, and allowing students to easily access and search the transcript corpus for cross-coding and final presentations.

I was in charge of listening to the "raw" grade 8 pilot oral histories, as well as the 701 student-guardians interviews to transcribe them. Each interview took 30 to 120 minutes to transcribe. This large time commitment was inevitable in order to listen closely and slowly. But it helped amplify nuances in the oral histories such as different English accents, cultural norms evident by speech tones and enunciations (e.g. hierarchy, pride, indirection), and other emotive aspects. Among many emotions and tones, I remember for example the authoritative tone of a parent/interviewee who started to quiz their offspring/interviewer on English words during the interview and *declare* that

they would become either a doctor or engineer so the family (here and back home) will be proud of them. This contrasted with other interviews (especially parents from other ethnicities) where youth said they would become dancers or rock stars and the guardians seemed supportive of their dreams. I also recall the pity/longing evident in the voice tone of a guardian due to the loss of the "*social way of life*" that they experienced by leaving their home country. Another tone I heard in the audio interviews was bewilderment about life in diaspora.

The text and common narrative did a great job in reducing many aspects of "strangerhood". It is hard to say what kind of impact these nuances would have had were they included in the analysis, but the point I make here is that the cohesive home narrative emerging was not a full reflection of the interviewees' lived experiences of it (past and present) as conveyed by the audio. Scholars report on the tensions that exist between the "raw" oral history interview, and its "cooked" versions e.g. transcripts, audio excerpts, and digital curations [115, 341]. There is "fondness" for generating cooked versions to go into "exhibits, films, and Web sites as the main locus for instruction, appreciation, and criticism ...[as] the place where the discourse of meaning and value is grounded" [115]. At the same time, when we "play back the tape" and listen, "interviewers inevitably hear more than they did during the interview itself" [285]. This reflection speaks to the original core of oral histories: personal memory narratives "are always articulated in relation to broader cultural circuits" [338], and traditionally intended for thoughtful, slow engagement. Unlike text transcripts that "can be skimmed, recordings have got to be listened to and watched in real time" [115]. Today, there is emphasis on the analysis and curation. But the human voice on its own can offer the "interpretive frame" necessary for the story [341]. As others have argued,

decoupling the transcript "from its broader interview context may diminish the interpretive richness of the interview" [341]. Further, "cultural circuits do not only offer a set of languages or frames of reference which an individual may draw upon (or intervene in) when articulating their personal experiences and subjectivities. They also present a dynamics of power in which some narratives of past and present become more 'speakable' and 'hearable' than others" [249]. These nuances, which distinguished each interview from each other, were naturally gone in the text transcripts which further supported the surfacing of commonalities. The move from audio to text is therefore a powerful tool to support finding commonalities by removing layers of nuances that can otherwise be too different to consolidated.

3.7.4 Codes and Categories

One of the goals of qualitative research is to identify patterns as "stable indicators" of humans' ways of living and working to render the world "more comprehensible, predictable and tractable" [303]. In data sets, codes start to repeat throughout. Saldana clarifies that such repetition is "both natural and deliberate – natural because there are mostly repetitive patterns of action and consistencies in human affairs, and deliberate because one of the coder's primary goals is to find these repetitive patterns of action and consistencies in human affairs as documented in the data" [303]. Raw data can be riven with "the messiness of people's lived experience" [249], so codes and categories help tame that messiness by extracting commonalities. The ultimate goal of analysis is to "convince the readers that this particular finalized analysis and its approach is the obvious choice, that is, the most evident, telling, and illuminating one" [186].

In the Meaning of Home Project, I was very proud of the category plate activity (Figures 3.1 and 3.4) because it was really fun and engaging. In reflecting on the project, I now see that the plates visually illustrated the final goal of qualitative data analysis: exclusion and convergence. If a code did not fit in one of the pre-designated plates (I designated the plates after going through all the codes students generated), it stood no chance to be in the final findings. One example of that is a parent who noted that the lack of *Halal* (meeting the dietary restrictions of Muslims) restaurants on the island impeded his sense of home. This code was an outlier since it constituted a data point that deviates "markedly from others" [9]. It therefore could not propagate past the group level, it did not belong to a plate, and of course it was not in the final set of codes we used at the class level categorization. We can see the performative and powerful aspects of the category plates if we link them to liberal Western democracy itself, where what does not fit into its organizational scheme is defined as objectively irrelevant, incapacitated, or adversarial [31]. This highlights a tension similar to the one discussed in the previous section, which is that oral histories "appear as complex and sensitive cultural texts that carry within them a (de)constructive potential. As they challenge or negate the erasures at work in popular discourse, they simultaneously bring into view more complex and messy forms of experience and subjective recollection" [249]. But coherence and shared narrative are generally the goal of category extraction in order to "organize phenomena bewildering in their layered complexity into clean overviews. They make smooth schemes that are more or less linear, with a demonstrative or an argumentative logic in which each event follows the one that came before" [233]. With that in mind, we see the readily available prowess of codes and categories in producing a common narrative.

3.7.5 "Hometown" (in lieu of "Home") Protocol

This approach, while not as generalized as the previous four, is still underpinned by the same desire for streamlining data. The pilot interview protocol (Appendix B.2) asked about both the interviewee's "home" and "hometown". Almost half of the questions (4, 5, 6, 8, and 12) centered around the interviewees' "home": what their (childhood) home was like, the memories they had of it, their favorite parts in it, what their current homes are like, and what changes they would make to it. In the final protocol (Appendix B.3), we simplified the questions, omitted a few, and made them all about the "hometown" in order to make the protocol more cohesive. This simple word switching (which we did not dwell on for long) led to discernible differences in the resulting oral history accounts which we did not expect nor intend. Interviewees in the pilot protocol interpreted "home" as the physical house, so their responses were specifically tied to it. Examples include enjoying mountain views and apple blossom aroma from apartment balcony in Almaty, living in open coconut tree houses in Kiribati, recalling the breeze (and socializing) such open homes afforded, and proudly setting up a study nook with curtains in an Indian apartment to work hard for a future abroad. When we switched to "hometown" in the protocol, the answers became more generic, raising many repeated (i.e. common) memories such as going to parks, enrolling in university, getting delicious food, and meeting up with friends. The first (pilot grade 8) corpus was therefore rich with context-specific differences. It captured cultural identities and place-making efforts crystallizing within and through the domestic spaces humans occupy (I observed parallel nuances in my work on home sketching with immigrants [294]). The second corpus on the other hand defied a lot of these differences by virtue of its more

generic/common memories, which can be partially traced to the protocol. This seemingly simple switch in the protocol design led to data that was further amiable to commonalities and less riven with difference.

3.8 Staying with the Raw, Outlier, and Different

In the Spring of 2018, I read "Making Time for Soil" by Maria Puig de la Bellacasa [274]. Her article, which I discuss at length in the next chapter, is inspiring and breathtakingly beautiful. So much so that it completely restored my passion about being an academic when I had just quit ICTD and was struggling to find my path again. But what is relevant to the discussion here is that at the time, I was also struck by how Puig de la Bellacasa was not making a new argument; her piece is ultimately a call to slow down industrialist and unsustainable food production practices. The unique combination of anecdotes, metaphors, language, and care framework however delivered the common message in an orchestration so fresh it rendered the issue and its oughtness anew. In this chapter (which is not remotely close to Puig de la Bellacasa's masterpiece in topic or eloquence), I synthesize a PDI, Simmel's stranger, some empirical data and critical reflection to show that popular data analysis methods tend to surface commonalities rather than difference. A few papers make a similar argument, but they are mostly from the health sciences and use different methodologies [126, 221, 266, 253]. The combination I introduce in this chapter is therefore novel, but it ultimately culminates with three commonplace arguments many scholars have already made: (1) that we need to listen to the raw oral history recordings [252, 207], (2) that we need to pay attention to outliers in the data [126, 253], and (3) that we need to engage more with

difference [67, 320, 384].

We live in an age where information recording and access is fairly easy, ubiquitous, and individual, but thoughtful, prolonged, and "slow" listening is not. A big question for oral history archives today is how to approach their hours and hours of audio interviews which carry in their data bits numerous nuances. The common strategy of curating, or "cooking", oral histories leads to reductive outcomes that can be easily lost in the plethora of consumption media available online. Further, scholars have noted that representing research findings is "the height" of our "authority in the oral history process" [196, 114]. That is how and where we decide what is included and excluded and which narratives are amplified and demoted. In *Meaning of Home*, we exercised that authority and built a common narrative based on the processed oral history transcripts. Now we must ask: how do we balance the cooking process? In *Story Snacks*, I explored many ways to listen to oral histories, including through a walk and listen activity on Roosevelt Island, attending an oral history listening party in Brooklyn, speaking with oral history experts, building paper prototypes, and doing some user testing around listening. What I have learned is that we should advocate more for consuming "raw" oral histories, but it is not a trivial process especially with how distracted urban populations are. We could for example consider making oral histories (or the process of transcribing them) a social activity that can support sitting down and *making time* for someone's life story [252, 207]. A second suggestion is to create civic contexts for transcribing oral histories. Transcribing, while slow and frustrating at times, can afford an unparalleled level of long and intimate attunement and engagement. I have had the pleasure to experience that through the *Meaning of Home* Project and transcribing the pilot and 701 oral histories remain some of my fondest PhD

memories.

In Coding and Categorizing (section 3.5.3), I discussed how the oral history data in Meaning of Home underwent three layers of filtering and "streamlining": at the group coding level, at the group categorization level, and at the class categorization level. The result of this filtering helped us seamlessly find a common notion of home for 701. Doing this process with students who were highly diverse, and seeing their surprised reactions about the convergence, remind us that qualitative data analysis techniques are majorly geared towards finding *recurring* patterns, rather than outliers and idiosyncrasies. In this analysis process, "contradictions and complexities inherent to data", or *exceptions* as Phoenix and Orr put it, can be "ironed out" [266]. As I argued in the previous section, this was further reified (sometimes intentionally, sometimes unintentionally) by our visual focus on the most frequent words in WHiGC, a simple change in the protocol, and the switch from oral to textual. Collectively, our design and data analysis processes readily supported and simplified finding commonalities. This was not the case with other design based approaches to difference covered in the dissertation - care and conflict - where we had to challenge many mainstream design principles in order to make the projects (and writing) happen.

Given the multitude of design mechanisms available to sideline outliers, there are two questions we should to ask in the fields of design research and those using qualitative and quantitative social data. First, when is it generative/ethical/necessary to pay attention to outliers (i.e. difference)? Gibbert et al. give us a good starting point by offering a few scenarios such as using outliers as a signal to collect further data or to check if there are a common

threads running through "deviant cases" themselves [126]. A third scenario would be to take outliers as guidance to "use multiple forms of analyses" and "examine our data from different viewpoints" so that the contradictions and complexities in the data are not flattened [266]. Compared to quantitative analysis, I believe that our task in qualitative data land is both easier (since we work at a statement by statement level) and more challenging because we do not have a plot or a "line of best fit" to tell us where to look for difference. A second question we should ask pertains to approaches we leverage in design itself to handle difference. Namely, what potential harm do popular tools such as personas potentially afflict when designing for a diverse society given (at times) their useful but reductive nature? And in what ways can we counter-balance that?

The third and last argument I conclude this chapter with is the need to find ways to engage with societal differences (and strangers) rather than circumvent them. In other words, if many of our research tools (data analysis, design) are less optimized to surfacing and confronting difference, then how do we meaningfully engage with it? I will save the answer to the next four chapters which will explore this question through various case studies and theories.

3.9 Conclusion

In this chapter, the combination of intergenerational oral-history collection and qualitative data analysis was elaborately leveraged to help students surface a common notion of home among them and their guardians. The processes of manual qualitative analysis and quantitative computational analysis in-class

converged on a joint narrative of home rooted in family, memories, friends, and nature. This chapter reported the affordances and limitations of a deliberative approach aimed at consensus building including how exhilarating it was to see commonalities emerge, but why that was not enough to mediate the daily conflicts and dilemmas that arise in pluralist societies. It also reflected on five design tools and approaches that helped support the process of finding commonalities and concluded with the need to stay more with difference, outliers, and raw oral history interviews. The next two chapters will cover two strategies that wrestle more deeply with difference rather than defy it by seeking commonalities.

CHAPTER 4
**TENDING TO DIFFERENCE WITH CARE: LESSONS FROM A SERVICE
LEARNING COURSE**

Given the overarching impact of technology on society, professional ICT programs are increasingly interested in engaging students with external organizations. But given the focus of such programs on technical and managerial skills, community engagement attempts can be prone to an asymmetry problem, with students gaining skills and experience but partnering communities not ending up with enduring artifacts or benefits. This asymmetry stems from underlying differences in timelines and priorities: students are generally invested in CV-enriching outcomes, novel artefacts, and capitalist productivity standards. Community organizations on the other hand prioritize carefully designed and reliable (even mundane) tools that would work for them and their patrons instead of rushed technical innovations. This chapter describes a graduate-level service learning course developed and taught at our institution in partnership with civic organizations from the campus vicinity. It shows how leaving service projects deliberately open-ended can help infrastructure social-material relationships between our graduate students and community members and create “care time” among the two. By drawing parallels to soil care practices and care-imbued pluralism, this chapter explores how care supported working across a plurality of differences in an urban context to balance diverging priorities and time frames, overcome social limitations, build symbiotic relationships, and enact more fulfilling collaborations. The chapter also reflects on how this care-based approach to difference entails some tensions and requires time, "invisible" work, and

compromises from the sides involved.¹

4.1 Introduction

Technological development is one of the primary drivers of contemporary political economies. Within its arena, there is a deliverance of "restless futurity" that privileges novelty, emphasizes productionism, and cultivates a sense of urgency to act now and fast to catch a future that is being "written in the present" [60]. This dominant mode of techno-innovation mirrors the "anticipatory" state of our daily lives, shaped by attempts to manage the unknown ahead, inhibit its "states of uncertainty", and build "the best possible future" [5]. The present is therefore a tumultuous worksite for cultivating capacities and resources, compressed in favor of a grand future of a happier "us", enmeshed in safe, healthy, accessible, prosperous, optimized, and more equitable societies.

Technological advancements do more than promise to enhance our lives and tickle our fancies; they perpetuate the pervading "Thou shall not regress" imperative [335] committed to "the speculative extraction of future economic value" in a "progressivist, productionist and restless mode of futurity" [274]. But in their sweeping propagation, tech innovations can also produce "unnerving, unfair, unsafe, unpredictable, and unaccountable" outcomes [316] such as implicit bias [250], algorithmic manipulation and opaque politics [49, 97, 305], impregnable "black box" systems [14], invasive monitoring and control [199],

¹This chapter is fully based (with edits) on a previously published article. I have permission from my co-authors and the publisher to use the work in my dissertation. Copy of the publisher copyright permissions are in Appendix C. The article citation: Samar Sabie and Tapan Parikh. Cultivating Care Through Ambiguity: Lessons from a Service Learning Course. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, CHI '19, pages 277:1–277:14, New York, NY, USA, 2019. ACM. DOI: <http://doi.acm.org/10.1145/3290605.3300507>

and unbalanced accountability [95]. This begs the question of how to hold accountable the "innovate or perish" tech paradigm so that the plurality of user and community needs are met in ethical and *care-full* ways.

One high-leverage strategy could be to focus on students in professional graduate programs, who already are or will become the leaders of this exhilarating yet concerning trajectory of techno-futurity. However, students in short and costly graduate programs typically have very little time to engage their technological learning in real-world contexts, or cultivate relations, relatedness, and care towards a wide range of worlds their work will impact "in order to make a difference" [273]. As a result, when these professional degree holders move on to "change the world", their relational sensibilities typically lag behind their technical mastery. After all, making time to enact care, interdependence, patience, attention, attunement, and maintenance towards target users seems obscure and inefficient in the context of streamlined notions of productivity, success, and innovation of the field.

To address these limitations, we² designed a service learning course titled "Remaking the City" that asked these students to apply their knowledge and skills to help real-world local non-profit organizations. We were motivated by the work of Science and Technology Studies (STS) scholar Maria Puig de la Bellacasa on human-soil relations [274], where she weaves a strong case for augmenting productionist logic with making time for *care*; an increasingly popular framework within ICT discourse [201, 349, 387]. In this chapter, I report on our experience with the course, focusing on the importance of the design principle of ambiguity in creating space for students and the

²My advisor developed and taught the course and I was the teaching assistant and primary field researcher

partnering organizations to navigate their differing priorities and relationships and understand the value of care in their own terms. The paper's main contribution is translating the relational notion of care, typically applied in ICT research contexts (or theorized as an approach to the political [67, 320]), to a pedagogical context through the deliberate introduction of ambiguity. The tensions to be discussed illustrate that it is neither easy nor natural to introduce a care-imbued framework to approach pluralistic priorities and time frames into professionally-oriented ICT graduate programs that rarely go beyond user (and product) centered design. We further contribute an analogy to holistic soil care practices from STS to make it easier to concretize the notions of contradicting timelines, harmful consequences, interdependence, and collective flourishing that we found valuable for our analytic framework.

4.2 Relevant Work

4.2.1 Service Learning

Service learning is a project-based teaching technique where students apply what they learn in class at local agencies to promote positive change [4, 122]. In addition to the potential community benefits, service learning has been shown to create a more positive learning climate [281] and help students develop professional skills such as collaborative work, project management, and leadership [167, 254]. On a more interpersonal level, service learning nurtures a sense of civic engagement and citizenship [48, 62, 223, 231], self-efficacy [20, 125], critical thinking and problem solving [133, 232], practical

knowledge application [366], trade-off analysis [248], contextual awareness [62, 231], career exploration [366], and role finding within a larger context [98]. Furthermore, service learning transforms the course into a social activity through which students find meaning within the context they engage in, connect to social networks [106], develop empathy and humility [153, 282], and feel empowered to be a part of society [247].

A prevailing challenge in tech service projects is that the needs of community partners often require effort to identify and approach, and to then address through feasible and reliable interventions - all which requires time beyond semester limits [145, 204]. Unless elaborate constructs are applied to ensure continuity [355], there is an "asymmetry problem" [288], with students gaining skills but the community not benefiting. Furthermore, there is a concerning assumption that "ICT is ultimately a social good and hence providing free ICT consulting is by definition a social good as well", which Connolly cautions against, calling for a more critical and relational approach to the paramount complexities of technology and society [66]. Our work adopts this critical stance to service learning, by engaging the question of how systems and institutions sustain social problems and injustice, and focusing on "developing authentic relationships in the classroom and in the community" as one way of addressing asymmetry [230].

Scholars have found that foregrounding academia-community relationships through service learning reveals the tensions of *doing for* vs. *doing with* and the challenge of balancing real impact with pedagogical goals [223]. Involving students in this discussion concretizes, augments, and even challenges what they learn as they directly grapple with the forces, biases, uncertainty, and

unexpected circumstances [42]. Hayes and Cuban capture the gestalt of such service learning experiences with a "border crossing metaphor", both physical and demographic, where "self, knowledge, and culture" are constructed [154]. They note that unlike highly-structured modes of learning, ambiguity and complexity can arise when real communities are brought in. But "rather than seeing this as problematic, suggesting the need to give students more structure or direction", we must "appreciate and value ambiguity and uncertainty as opportunities for different types of learning from service... [and] constructing new kinds of knowledge and relationships that go beyond what we or they may have anticipated" [154]. In that sense, "knowledge is always partial, continually being created and recreated in response to new ideas and experience" [154].

Our work echoes many of the positive outcomes, sentiments, and challenges reported in the literature. But it abandons the interventionist approach of technology and the "deficit-oriented" view of the community [72], focusing instead on how students and community organizations find shared meaning by facing ambiguity and negotiating relationships. Furthermore, we highlight through qualitative analysis the often-omitted perspective of community organizations on technology service projects, and how technology served as a "hook" for stimulating a collective conversation on care, solidarity, accountability and situational awareness.

4.2.2 Participatory Design and Infrastructuring

Participatory Design (PD) facilitates direct collaboration between users and designers in contexts beyond formal enterprises and institutional structures, including activist, hobbyist, and non-profit community groups [84]. Such groups often lack the resources and capacity to successfully design, implement and deploy technological solutions. Furthermore, their projects often relate to a wide range of stakeholders who may not be fully represented during the co-design process [35]. PD scholars advocate "infrastructuring" [93] to address these limitations and the overarching ethical implications of co-designing tech ecosystems in community contexts. Le Dantec and DiSalvo define infrastructuring as "the work of creating socio-technical resources that intentionally enable adoption and appropriation beyond the initial scope of the design" [194]. This approach emphasizes the potency of relationships within intricate social spheres in driving tech-infused outcomes [178], recognizes their role in supporting "ethics in practice" [201], prioritizes "socio-material working relations" over artefacts, and broadens the notion of innovation beyond products to include "a principle, an idea, a piece of legislation, a social movement, an intervention, or some combination of them" [35].

In applying this expanded, relationally-charged approach to design, Le Dantec and Fox narrate the work it takes to build and mend relationships with the academic institution's proximate community [195], Bødker and Kyng speak about building partnerships for a new impactful form of PD [52], Agid theorizes the relational practices emerging in her work as a designer with a social justice organization [8], and Light and Akama explore the nuances of interdependence when intentionally "co-designing ongoing future societal relations beyond the

immediacy of designing objects or services during project time" [201]. Our work translates these frameworks of relationship-building from design and research contexts towards the goal of training future ICT practitioners. We show in a pedagogical setting what it takes to infrastructure social-material relationships across the two *neighbors* (more on that in the next section), deal with their ambiguities and nuances, and enact care for local communities.

4.2.3 ICT and Care

Prior literature includes care as one of the perspectives students acquire and demonstrate through service learning [282]. The theoretical lens of care is also increasingly adopted in ICT discourse [201, 234, 246, 349, 377, 387]. Maria Puig de la Bellacasa posits care as affective enactment, an "ethico-political obligation" [272], and a relational ontology; "to care about something, or for somebody, is inevitably to create relation" [273]. She invites us to attune to the care permeating everyday relations and make "care time" for what matters, be it in biological, sociotechnical, or scholarly contexts [275]. By foregrounding involvement, affect, interdependence, care time, relationality, and repetitive adjustment, nurturant relationalities can emerge as alternatives to the aggressive temporality of profit-driven techno-scientific innovation [274]. Care supports "continuity of life", affirms "a moral relation" to the cared for [170], and its "slowness" nourishes co-existing ecologies not running at the speed of innovation-driven capitalist economies. In this sense, care time offers "glimpses into a diversity of timelines that, despite being made invisible or marginalized in the dominant timescape, can challenge traditional notions of technoscientific innovation" [274].

Light and Akami build on Puig's rationale of caring "as intrinsically relational, situated inside interdependency" within the context of participatory design [201]. Toombs et al.'s ethnographic inquiry of the "sociality of hackerspaces" elucidates how the culture of independence, techno proficiency, and neoliberalism in such spaces is counterbalanced by implicit and explicit acts of care, with "hidden-but-enacted" interdependence that deepens the hackers' relationship with the broader community [349]. Zegura et al. advocate social good through the practice of "care-oriented data science" that valorizes "collective tinkering" from the community [387]. From ICTD (Information and Communication Technology for Development), Wong-Villacres et al. examine how care helped reconcile online-offline disaster relief efforts [377] while Karusala et al. reveal how caring behaviors create a sense of interdependency and community at an underserved learning center in India and how to extend that with technology [180]. In academic settings, Atkinson-Graham et al. probe care dynamics emerging throughout their careers as graduate students with advisor, collaborator, and research subject/object encounters. When understood as sensitizers to what is subjectively important, actions of reflection, tension, assurance, puzzlement, engagement, withdrawal, and self-interest then become facets of "how to care" [21]. Finally, Martin et al. argue that care can emerge out of anxiety and uncertainty as much as by positive intentions [216].

Care has also been proposed by political theorists and urban sociologist as a way to navigate the daily social "collisions" among groups and individuals differentiated by many factors [160, 67, 320]. In this care-imbued pluralism (discussed in more detail earlier in section 2.2.2), individuals can see different world views and hold dialogical skills, time for care, and transcendence over difference. In that vein, Connolly proposes a double-entry proposition to

the experience of time. The first entry is punctual time where one pursues obligations they are already accustomed to. The second entry is time as creative evolution, where one experiences events, sights, or learnings that create "tension between new experiences and the underbrush of prejudgments heretofore attached to them", which in turns engender *moments of becoming* that lead to ethical evolution around difference [67]. In urban contexts, Sennett calls for street benches strategically enmeshed in the city hubbub as moments where such temporal interludes, reflections and transformations could happen [320]. Historian Michel de Certeau similarly holds the perspectival suspension from reality occurring momentarily for example by being in a voting booth or a train cart, as necessary "for the birth, outside of these things but not without them, of unknown landscapes and the strange fables of our private stories" [75]. At these moments of care-full dwelling, "hierarchies of dogmatic orders" and individualism are muted [75]. When one dwells in an experience, they may sense a twist that shifts the experience trajectory elsewhere, sensitizing the individual to "forks not pursued as well as to some that were" [67].

Our work translates this relational notion of care from research projects and theory terrains to a pedagogical context. Research allows longer time frames with subjects trained in ethnography and focused on research outcomes. It is therefore difficult to adapt this framework to pedagogical contexts given constrained time frames and different incentives. We probe how to make care time when time has a high premium, such as in busy and expensive graduate programs, mirroring the high pressure and output-driven work environments that students will encounter in the future. We show how dominant pedagogical "timescapes" can team with timelines of care towards the community even if that renders student output "unproductive" within the dominant innovation

logic. And we identify how course activities can act like Connolly's moments of becoming [67], Sennett's city benches [320], de Certeau's train carriage [75], and Dewey's stepping out of routine consciousness [80].

4.3 Background and Motivation

Soil care practices inspire us to see an analogy in how techno-innovation focuses on the cultivation of novel artefacts and intellectual property through the application of venture capital the way food production harnesses soil's fertility to intensify crop yield. In both, furious productionism eliminates interdependent relations in order to maintain an uninterrupted production trajectory. Also in both, creating time to attune to others factors (such as the needs of other human and beyond) and restore care-full interdependence seems promising. Puig de la Bellacasa draws our attention to the dangers of the eradication of this interdependence which in the case of soil, includes seasonal rain, bustling predators, and fluctuating biota conditions. By (1) ignoring "the complex diversity of soil renewal processes", asynchronous with tight capitalist timeframes, and (2) invisibilizing its wealth of organisms with off-farm testing and entomological potions, soil is reduced to lifeless substance, its biota aggressively eradicated, and future food outputs jeopardized [274].

Similarly, real communities are often dismissed in most technology development paradigms, being compressed to personas, stakeholders, prototypes, and other design abstractions. This is because external dependencies, such as probing common assumptions about technology at real sites of digital divides, can induce delays, complexities, and uncertainty

transgressive to the tight timeframes of implementation and monetization. As a result, deep engagement is not recognized as valuable in training contexts given the marketable technical and managerial skills that students must acquire.

Indeed, within the applied/professional master's programs at our institution, it is normal for students to take 6-7 courses per term, work on assignments until the early morning hours, continuously prepare for job and internship applications, as well as work as research and teaching assistants. Such an intensely productionist approach does not leave future practitioners enough time to attune to others or fathom their "accountabilities to the worlds that [they] co-construct" [216]. Cultivating an ethos of care for the community therefore seems as subordinated as slowing down food production to the natural rhythm of the soil habitat.

4.3.1 Making Care Time through Engagement

Puig de la Bellacasa and other soil scientists [121, 164] advocate making food production practices more responsible by giving farmers the time to develop a feeling for the soil, to appreciate its biology and conditions through manual sampling and testing, long-term observation, and working with its natural ecological cycles. This is analogous to the time requirement scholars set for pluralism to demote indifference and support ethical urban commitment and engagement with differentiated others and needs [320, 67]. Back to soil, through "co-mingling with its substance", "commitment, concern, and empathy" and an appreciation for natural soil dynamics develop [367]. As a result, fertility is improved, output is increased, and production is sustained in the long term

[274]. Analogously, we see the need to cultivate an intrinsic sense of care in future ICT practitioners towards communities through similar co-mingling, with the hope that trainees show "commitment, concern, and empathy" towards the users of their future systems. But embodied immersion in societal spheres is not as straightforward as the haptic engagement of farmers with the soil and its fauna with apple corers and basic microscopes. For one thing, a relationship already exists between farmers and soil. Fostering symbiotic community relationships is typically not part of most students' academic training, especially those focused on technology. So a deliberate intervention (e.g. a pedagogical context) is needed. Care through direct engagement, be it in soil or pedagogical contexts, shifts relations from obliviousness, defiance, or control to that of interdependence, attention, and maintenance.

4.3.2 Situated Engagement

In her writing [274, 275], Puig de la Bellacasa sees soil as a whole community right underneath us, lively, vibrant, and teeming with life. She calls on humans to become members of this community, rather than mere consumers of its natural capital. Analogously, there are living communities directly "beneath" campuses: diverse, human, and lively, with robust capital of their own. University students typically relate to them through compulsory spatial consumption: sharing streets, communal facilities, transit hubs, and zip codes, but not necessarily through pedagogical bridges. With such bridges, this shared physical reality, co-mingling, and inevitable collisions could incentivize various forms of pluralist exposures and collaborations, allow "thoughtful and protracted observation", and give students the chance to "experience the

specific 'schedules' happening within the arrangement of life cycles" [235] in their institution's proximate community. We believe that such active forms of situated membership can carve more opportunities for busy students to make time to learn to enact care through tech interventions and carry that with them in their future practices.

Our prior ICTD research in India, Sub-Saharan Africa, Central America, and the Middle East helped us relate to how the physical and social detachment from these sites made it hard to engage sufficiently with their community members, sustain projects or gauge their positive or negative impact in the long term. By situating work in our own communities, everyone can work together to envision, implement, and sustain new technologies, services, and delivery models that we are collectively held accountable for. Community members and leaders can then grab us on the bus, street, supermarket, park, or doctor's office, and ask "What's going on here? Why is this not working the way it should?". This forces us to dedicate "attention and fine tuning to the ... rhythms of an 'other' and to the specific relations that are being woven together" [274]. Furthermore, this approach positions us not as external technology designers and implementers, but "as attentive members of a specific ... community" [274]. Our pedagogical approach to tech that privileges an open-minded, humble, and attentive perspective is further shaped by our personal involvement with the community by residing on the island and engaging in various activities such as co-teaching a social studies unit at the local middle school (described in chapter 3), hosting a civic design summer program for youth (chapter 5), serving with the residents' association, and organizing events to bring together academic and community insights on relevant topics, among others.

4.4 Remaking the City

Remaking the City is a master's level service learning course that we taught to engage students in service learning projects with local community partners. More details are provided in the next section.

4.4.1 Background and Context

As narrated in chapter 1, Cornell Tech is located on Roosevelt Island, a narrow 3.2 km-long sliver of land encompassing affordable and luxury residential developments, schools, shops, restaurants, parks, a bank, a postal office, and a long-term care hospital. Our campus started operations on August 1st, 2017. A community affairs director from Cornell was stationed on the island for three years during campus planning and construction and held regular office hours at the art gallery. Over these years, members of the community expressed trepidation, curiosity and anticipation of what the relationship with their new neighbor might look like. Their primary concerns included fear of continued gentrification, increased load on transportation and other infrastructure, too much outside attention that would jeopardize the calm and intimate vibe of the island, and highly transient student populations that come and leave without contributing to the community.

The campus is located on the south end of the island, close to the ferry terminal, tramway, and subway station. Island residents speculated that these transportation options would act as "a vacuum", sucking students to other parts of the city to eat, shop, or otherwise hang out. Several residents mentioned that

they were concerned that students would not visit the north part of the island where the majority of community lives and most organizations and businesses are located.

Admittedly, our context is unique: a new high-profile campus on a small island within but apart from a busy metropolis. We have not concealed the qualities of our location because the specifics *matter* – and are intrinsic to describing our subjective position in this research. We were also inspired and cautioned by Le Dantec and Fox [195] about some of the corrosive dynamics academic institutions could enact on their proximate communities. In our case, the university had already displaced a large public hospital that provided long-term rehabilitative care to low-income patients. Our goal was to ameliorate some of the disruptive impact of our presence, by supporting students in becoming "confidants", "advocates", and "collaborators" [195], and by facilitating knowledge exchange and care between the two populations. This is because to "become of the community" requires a collective ethos, as societal relationships entail many individuals, each with their own notion of belonging. Furthermore, the outcomes of engagement and partnership are "secondary to the issue of *how* we [intend] to work with the community" [195]. The essence of "building rapport" is in the process itself, akin to the way care emerges in ordinary moments such as cultivating soil [274], working in a hackerspace [349], or conversing with a mentor [21].

While a few faculty and staff live on the island, it is the students (500 at the time of this research, of which 75% lived on campus) that constitute the vast bulk of our campus community on the island. Most of these students are enrolled in one to two-year professional master programs, requiring five

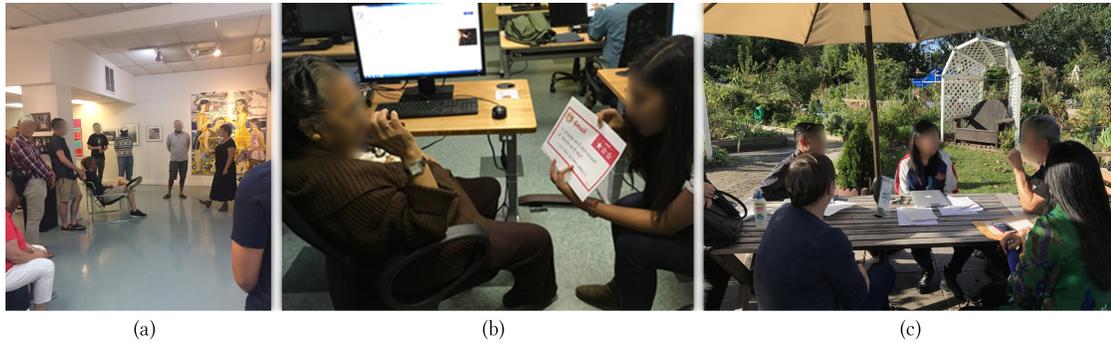


Figure 4.1: Remaking the City Activities: (a) meet and greet at the art gallery, (b) co-design activities with older adults, and (c) informal meetings with community partners

to seven courses per term. Many are also employed as teaching and research assistants, and intern during the summer to address the high financial costs of attendance. 50% are international and tend to travel home or explore the rest of the city and region during downtime rather than mesh into the local community. Given these demands on their time, it is difficult for students to collectively negotiate societal membership and shared temporality with the community, and to be cognizant of the need to co-construct alternatives immediately outside campus while simultaneously working towards global impact. But both community residents and some of us on campus did not want to be neighbors who remain "neighbors" in the Sennettian sense where one does not understand their neighbors, and ultimately turns away from them, indifferent [320].

4.4.2 Course Goals and Partnerships

One of the course goals was to understand the unique technological challenges faced by small civic organizations and the role technology can play in service

delivery in urban contexts. Most technology ventures focus on serving individual consumers or large organizations, leaving smaller organizations in the lurch. We reached out through our community affairs director to several such organizations on the island during the summer of 2017. Eventual partnering organizations included the local municipal body, historical society, garden club, dance theater, senior center, and art gallery. Some partners had more than one project and worked with multiple student groups. One student group worked independently with a variety of retail and food vendors on the island.

4.4.3 Activities and Timeline

Remaking the City was defined by open-endedness in terms of project scope, nature of deliverables, and level of technical innovation expected. To ensure that this ambiguity did not result in a lack of accountability to the course or project partners, multiple constructs were embedded to create opportunities for students and partners to encounter and navigate this ambiguity, and strike a balance between learning, service, impact, and affective engagement.

1. *Service Component:* Teams of 2-3 students were asked to "commit up to 5 hours per week to support their partnering organization's technology needs." We left the actual requirements open to encourage students and partners, each with unique needs, resources, skills, and interests, to individualize their collaboration. By avoiding overly prescriptive requirements, our goal was to foster mutual dependency in navigating this ambiguity. Examples of service projects included creating a Google

map of green spaces on the island, introducing maintenance personnel to a cloud-based GIS service, designing a new website, prototyping web literacy cards for seniors, and helping an organization migrate to Google Apps email hosting.

2. *Speculative Design Component*: Six weeks before the end of the course, students were asked to start thinking about a plan for a project, technology or initiative that would impact the island or a specific community on it within 3-5 years. Two of the student teams chose to work with their existing partners to come up with this proposal. The final deliverable was a presentation and report with a low-fidelity prototype and implementation plan.
3. *Meet and Greet Mixer*: This informal event (Figure 4.1-a) was organized during the first week of class (also the first official week of campus) at the island art gallery (also a project partner). Partners pitched their organizations' history, mission, whom they serve, and where they needed help (better mapping, mobile GIS, remote access to elderly patients, updated websites, etc.). Students had the chance to chat with these organizations before deciding which they wanted to work with. The conviviality of this symbolic co-mingling at the island's mid-point, with food, art, and impromptu conversations on life and technology, prompted a sense of togetherness, warranted independent care initiatives, and exposed fertile ground for emerging collaborations.
4. *Weekly Critical Reflections*: Students were asked to post weekly reflections on the course blog addressing the activities they did with their partner, their perceived utility, the resulting outcomes/design artifacts, emerging needs, obstacles, and tensions, and how their vision and ideas aligned

with their partners'. Reflections helped students tie their "constantly evolving perceptions, beliefs, and knowledge" [282] with the class material. It was also an opportunity to articulate the troubles they were facing in navigating ambiguity, get feedback from us and their peers, and to ensure accountability to the course goals and to their partners. We discussed the blog reflections once a week in class, exchanging advice and suggestions, and connecting student experiences to broader themes explored in the course.

5. *Semi-weekly Project Share-Outs*: Every 2-3 weeks, project groups shared their progress with the whole class or in smaller groups. The unique and open-ended nature of each project necessitated a forum for students to vent, hear other articulations of "progress", demonstrate value being delivered to the partners, and discuss various nuances of building relationality.
6. *Guest Lecturers*: Island residents active in civics, politics, and business came as guest speakers to address a variety of topics including island governance, urban planning, "civic" technology, the island's historical significance, and the campus planning and construction process. This bolstered the multi-faceted community engagement in the course and helped students understand and navigate the rich historical, economic, and socio-political dynamics of the island they increasingly encountered through their service projects.
7. *Lectures and Readings*: Material covered in the course lectures included guidelines on managing community relationships, participant observation, user research, participatory design, and urban studies covering salient issues such as race, immigration and gender. We

also conducted several design exercises envisioning new technological possibilities for the island including local currencies and interactive Internet kiosks. Through discussion and small group meetings, we emphasized care, impact, partnerships, patience, mutual benefit, and persistence over rushed technical interventions.

8. *Other Events:* During the first week of class, the president of the local historical society (also a project partner) took students on a walking tour of the island, which for many students was their first time venturing north on the island. Students also engaged with the community by organizing a food fair on campus, attending local town hall meetings, and pitching their speculative designs at the end of the term to an audience including island organizations and residents.

4.5 Methodology

This chapter is based on the firsthand experience of my advisor and I teaching the course and interacting with students and organizations, analyzed through Charmaz [59] grounded theory approach, and interpreted through the lens of *care*. My advisor was the lead instructor and I was a teaching assistant for the course. The findings are derived primarily from the qualitative analysis of 10 in-depth semi-structured interviews conducted in January 2018 with 5 (out of 23) students and 5 (out of 6) partnering organizations. Interviewees were organizational leaders or board members with whom students had worked directly during the term. The limited student participation can be attributed to some of them graduating immediately after the course, and their overall busyness with classes, specialization projects, and job hunting. Interview

questions for both included why they chose to participate, their expectations, challenges faced, perceived benefits, and recommendations for the course.

The interviews were audio-recorded and transcribed. All participants gave their consent to be audio recorded. Since I was not directly involved in grading or establishing partnerships, I initiated the interview invites, coordinated scheduling, and conducted the interviews. Interviews ranged in length from 25 to 120 minutes. A research assistant and I transcribed interview audio recordings and imported transcripts into QDA Miner Lite. Charmaz grounded theory approach was applied to inductively code the interview data. I read each transcript, assigning a code to every sentence (open coding), focusing on sentiments, actions, and timeframes that capture meaning making between students and partnering organizations. Example codes included "partner indecisiveness", "enjoyed talking to partners", "gauging meaningfulness to community", "inviting students to feel at home", and "hard to anticipate timeframes". Once consistent codes began to emerge, we drafted the first round of codes and tentative categories such as "ambiguity causing anxiety", "non-tangible gains", and "border crossing". Thematic analysis was further supported by our observations, local media coverage, the final course presentations and reports, and 130 student blog posts. We did not code this data as we were highly familiar with it through grading, frequent discussions with the students and research team, and re-visiting for paper writing. Instead, we used a constant comparative method to simultaneously compare codes and categories with uncoded data and refine accordingly. We also discussed emerging codes and themes with the research team and colleagues. After three iterations, the core theoretical idea of "care through ambiguity" began to emerge and was further refined along with the codes.

4.6 Findings

4.6.1 The Compounded Ambiguity of Service

Students generally found the design project easier to navigate as it did not require working with partners (only two out of 10 groups continued to work with their partners on the design project), and it emulated processes typical in their curriculum: visioning, stakeholder analysis, requirement elicitation, and pitching. On the other hand, the intentional open ended-ness of the service component was found to be much more challenging, for both students and partners. While partners were excited by the course and its potential, interviews showed that they did not know what to anticipate, how much to trust students, what to make of this initial collaboration, or what could be expected from a 5-hour weekly commitment. As one partner noted, *"I don't think I've ever worked with that large a group on something that was so completely wide open."*

9 out of the 10 service projects started with need-finding and participatory project-scoping. Such need-finding further compounded the natural uncertainty associated with real-world rather than "boxed" and "highly-scripted" classroom problems; *"I never try something like [that], we don't have specific needs and we are trying to find the needs not only from them [the partner] but also people who we are targeting"* one student recalled.

Ambiguity was also nurtured by the students' sensitivity towards their partners, privileging the latter's needs over more technologically sophisticated projects that might better augment their CV and skills. This implicit act of care was commonly referred to in student interviews: *"you can't go hey this is my tool*

kit, this is all I can do. You have to be open right? So, we were very open minded about it." It was also reciprocated by the partners, who worked hard to include the students' abilities, ideas, preferences, and "*excitement*". As one partner put it "*we needed to come to some kind of understanding about where each of us is coming from.*"

While partners put in time and effort, they were not willing to commit material resources such as licensing fees, web hosting fees, or hardware purchases for trust and funding purposes. Such constraints crippled the ambitious proposals students pitched, making them experience a looming sense of ambiguity and uncertainty as they could not address the partner needs using their familiar knowledge, skills, and training. Even non-ambiguous technological interventions, such as adding a donate/shop feature to a website or switching to a mobile-friendly GIS platform, were not straightforward to implement due to infrastructure constraints (e.g. organization volunteers unable to learn "newer" platforms such as WordPress), data gaps, and bureaucracy, thus impelling cycles and cycles of need finding and solution scoping transgressive to well-defined homework problems.

In general, we tried to nurture a collective interest in impactful rather than novel ideas. This was supported by lecture material, the partners' passion for their work, and the students increased sense of accountability towards their new community. Ideation and prototyping cycles were like a "*tug of war*", as a student phrased it, with all sides involved tempted at times to jump into implementation, but ultimately hunting for practical ideas that would truly benefit them and the community. For example, while user research revealed that a voice-activated ride sharing app might be great for older adults, one team

ended up proposing a less "innovative" set of paper-based web literacy cards that were more practical, and would provide definite and immediate value.

4.6.2 Navigating Ambiguity through Interactions

Many projects remained in the aforementioned state of flux two months into the semester. Partners were accustomed to that, and even found it refreshing; *"I love the organic 'lets just wing it' and see what happens"* a partner noted. Still, many students reported feeling a sense of anxiety as their projects did not appear to be making "progress"; *"it caused me more anxiety just not knowing what was going on... we felt we didn't know what we were doing so we need to figure something out"*, a student recalled. *"As things went along, it goes pretty messy"*, another student declared.

Nearly all teams reported in interviews or blog posts a commitment to regular weekly meetings, primarily in person. These meetings continued despite the extremely hectic schedules of students and partners. One partner described how she at times forgot about the meetings or had to tend to urgent matters, but students were happy to chat with other personnel or community members or follow her around and talk as she got things done around the organization. A self-described *"socially-awkward"* student who felt their partner did not take them seriously at the beginning commented on how their partner grew more *"excited"* with each meeting.

It was through these repeated meetings that both sides reported that their relationship gradually morphed into oneness. Typically, students are accountable to partners on the one hand and to the professor and TAs in charge

of their grades on the other: they must help the former and meet the curricular expectations of the latter. In Remaking, the interviews reveal an emerging collective sense of responsibility, with the students and partners becoming one body, in one vessel, navigating ambiguity to provide benefit to the community and meet course expectations collaboratively. As one student boasted, *"our partners were so willing to tackle the problems with us. They want to design with us. They want to propose ideas."*

Over time, partners started to loop in more of their staff and community members (Figure 4.1-b), sharing their day-to-day tasks and challenges. *"They helped us get to know the problems and everything that they had. We got three different perspectives...we got to see all those things and with [the partner's name] we got to see how the places administered and everything."* These conversations were not confined to offices; they reverberated in streets, coffee shops, apartments, festivals, on campus, at the farmers' market and gardens on the island (Figure 4.1-c), and in one case over a Thanksgiving dinner that students were invited to.

One of the most promising projects emerged from a team that was committed to meeting every week and talking for hours at various locations throughout the island. When they were asked about the success of their collaboration, they would say *"we're not really sure, but it's working. We couldn't explain [to the organization board] the gestalt of this really amazing process."* Frequent interactions helped everyone make it through *"the transitional path"*, care about each other, and find joy in the collaboration.

4.6.3 Building Relationships Over Artefacts

Partners mentioned in interviews gaining several indirect practical benefits, such as students exposing data gaps, realizing the limits of their financial and infrastructural means, discovering new things about their users through surveys and prototype deployment, testing new ideas, and completing dormant tasks. But students and partners seemed to value the relationships they developed more than any concrete outcomes or deliverables that did or did not result. Partners were unanimously grateful and enthusiastic about future collaborations; even if the project did not achieve any material goal, they valued the collaboration, fresh ideas, web and social media guidance, and learning things about our institute (for example, that we are not nerds "*who spent their day in the dark starting at a computer screen*"), and ultimately their own organizations.

On the student side, they seemed to get the value of "*partnership with people. I got that idea . . . to understand their needs before rolling up my sleeves to do something for them. Pretty quickly I think I got on the right track towards just talking with them, having a great time, building our relationship. Talking about work also talking about something from everyone's life so we can maintain a relationship like friends.*"

Some students felt that these relational outcomes were not useful for their portfolios or CVs, especially when compared to building sophisticated technologies like in other courses and research activities. But students acknowledged in interviews and course evaluations that they valued learning about product design, initiating collaborations, talking to the community to find solutions, and acquiring new skills to fit partner needs.

Finally, most interviewees appreciated that the course was explicitly not

about high-tech; *"this kind of a class is a break for me from everything else that I do. For every other course I do there are assignments when I'm sitting in front of monitor you know staying awake for 3-4am... I was totally ok with not doing machine learning for this course... I wanted to have a good experience and I wanted to partner with someone, work in a team"*, as one student explained.

4.6.4 Partners' Co-Ownership of Remaking

Our partners took co-ownership of the course from the time they first met students. They also helped us frame the class pedagogically by making the students and us understand the value of engagement and demonstrating real acts of care to students.

Partners approached their involvement with Remaking as providing value and service to our institution; *"we are more than willing to do things for the students"*, as one partner summed up her participation. Furthermore, partners named many skills students would have to acquire to succeed in life such as interacting with needy customers, managing real projects, expanding professional networks, taking initiative, and finding people with similar interests. As one partner elaborated, *"this whole island is a network. And that's why [your institution] has to become part of the network... the students have to find their own network ... [because] you have to get a job, you have to deal with people."* Another partner called it *"a sharing experience. They can learn from us, we can learn from them."* The learning and growth symmetry, propelled by frequently ambiguous interactions, cultivated respect, care, and commitment, and not only fulfilled the civic mission of service learning, but thwarted physical

borders, demographic boundaries, and power dynamics, allowing both sides to interweave their worlds into "interdependent existences" that fostered affective and material engagement" [273].

Our campus, brand new when Remaking launched, is "*an architect's delight*" where novel and revolutionary ideas are nurtured to drive global techno-economic innovation. But it can also feel alienating; "*too programmed and sanitized*" as one partner put it. The short duration of the professional graduate programs (1-2 years) and large international student population further exacerbate the issue. It is no wonder that student interviews (and partner speculations) reflected a sense of collective isolation and loneliness. For example, despite regularly asking students to share project updates and challenges with the entire class or in smaller groups, one student reported that "*it felt like we were this group foundering alone*". It was therefore heartening to hear the students feeling "*warmly embraced*" by their neighbors.

Students were invited to Thanksgiving dinners, festivals, and pizza, were given gifts and hugs, and asked caring questions such as "are you eating enough?", "do you miss your family?", and "aren't you working too darn hard?". "*It's something that doesn't happen at [our campus]!*" a student exclaimed. She had found a warm refuge at the senior center where she connected with many older adults despite their age and culture gap. Others interacted with local immigrants who were also building their "*own American dream*." These affective dynamics and acts of care "*changed a lot of my life on [the island] ... I was so happy throughout the semester... now I owe [the island]*" another student fondly reported.

In return, partners spoke fondly of the excitement of interacting with the students and our institution, the students' persistence in working around

obstacles, the energy that made residents "come alive", and engagement beyond the service project. For example, a partner recalled how one student "*would just stop in and say hello. I love that. I thought it was really wonderful that he would just stop in and say hello.*"

4.7 Discussion

The service dynamics in Remaking the City and its inherent ambiguity helped co-create social relations, rapport, and shared contexts within our community. This entailed challenging predominant pedagogical strategies aligned with future-driven productionist paradigms and the "erosion of casual encounters" [201]. It also meant creating spatial and temporal contexts for the two neighbors (students/us, community partners/members) to attune to each other. By revealing the "invisible cement" [201] of relationship building, we showed what it means to appreciate the "biology" of the community through care time and learn to share space (figuratively and materially) rather than being mere consumers. Furthermore, since care "unfolds in action" [387] and is "vague" [267] and "messy" [246], we articulated examples of its specificities that legitimize its varied forms and sentiments of enactment. This is important for tech students who are typically exposed to streamlined and alienated notions of productivity, success, and innovation. And is also important for urban populations more generally who, due to *the blasé attitude* [375], "see stuff happening" but "move on" and not "get involved" [320]. Below is a more nuanced reflection on ambiguity, care, and the role of technology played.

4.7.1 Ambiguity as a Way for Finding Meaning

Students and partners had a plurality of needs, resources, skills, and expectations that were unique to them. Therefore, the course valued emergent qualities, processual frameworks, and persistence implicitly (through open-ended requirements) and explicitly (through feedback, discussion, readings, and grades). Students who regularly talked to us about their fear of not meeting expectations were assured that they were fine as long as they were making effort and letting the process take its course. But students and partners still experienced the "forms of discomfort, confrontation, tension and precariousness" that Akama et al. report on their uncertainty-promoting design project [10].

In our case, the pragmatic and symbolic role of ambiguity was to (1) democratize the collaboration process so that partners and students had full control over what was meaningful to implement, (2) grant both sides the choice to purposefully forgo parts of the formal design processes given the tight semester timeline, and (3) free students from their intrinsic tendency to optimize for grades and CV credentials. In return, we legitimized less utilitarian, less measurable, and more affective dynamics such as care, shared ethos, civic engagement, situatedness, and dismantling interaction barriers. That helped students learn firsthand that knowing (i.e. ethical curiosity [320, 67]) takes commitment and immersion, good ideas require time, partners are not predictable, and the sheer messiness of the interaction of technology with real life.

To navigate ambiguity, students had to leave behind the artefact-centric, investor/manager (for which the professor serves as a proxy) mindset, involve

their partners in the quest to negotiate desired outcomes given the time and resource constraints, build relationships, and handle the emergent together, making that in itself a "central and welcome quality of how ... processes, relationality and environments", and that experience "...relies upon trust – in the process and in one another – and a sense of optimism and confidence that something will come through" [10]. The result was not only interventions and proposals, but symbiotic caring practices, each being "affective state", "ethical obligation", and "practical labor" [273].

Avoiding prescriptive orientations presented a challenge, particularly when it came to the fine line between negotiating emergent relations and just "slacking off". We introduced collective accountability through student progress reports on the blog, semi-weekly project updates in class, and meeting with groups that were confused or not making progress. We repeatedly stressed in class that the service project should provide immediate and tangible value for organizations - we just did not specify exactly what should be produced, hence the diversity of outcomes in the service component description in section 4.4.3. Our goal in introducing ambiguity was to redirect accountability from the class and university to relations with and within the community itself. Constructs in section 4.4.3 (weekly blogs, class updates, presentations, final reports, check-ins with organizations, and final presentations with an audience of community members) were incorporated to support an active process of reflection while ensuring that students were learning and partners benefiting, as evident in section 4.6.3. We also modeled care through our own involvement in the community. Ultimately, by giving students the time to care and embark on a journey to get the "biology" of the community despite the "looming time limits", we aimed to transcend the transactional and achieve the relational.

4.7.2 The Cost and Value of Making Care Time

The ICT literature narrates the unfolding of care within a specific orchestration such as data collection or working in a hackerspace [349, 387]. In advocating care-imbued pluralism, scholars admit the “gritted-teeth tolerance” [67] this takes, and the dilemmas and collisions encountered [160]. In the case of Remaking, care time was not marginal to the tasks on hand; it was the chief vessel for navigating ambiguity that it compressed the innovation expected by predominant pedagogical scopes in tech. From a capitalist perspective, care here was not “value-creating work” [274] because it contradicted material production and efficiency: the time students spent interacting with the community in various capacities was time not spent on coding, conducting rigorous user studies, or perfecting elevator pitches to attract VCs. Indeed, none of the service projects were novel or innovative from a technical perspective. Students and partners discovered through the course of their collaboration that good ideas take a long time to procure, as does building relationships.

To justify the importance of making time for care, Puig de la Bellacasa argues that such time is irreducible to productionist agendas, so we should not be “focusing on demonstrating the productive character of activities of care” and must instead show the importance of the “vital practices and experiences that are discounted, or crushed, by the productionist ethos” [274]. Steve Jackson’s work on care and repair [170] shows that “no output, no growth in the future, and . . . no innovation or emergence of newness are possible without a commitment to the everyday maintenance and repair that supports the work of care and continuity of life” [274]. Care is vital for creating “livable”, “lively”, and relevant worlds.

When we see soil as "living" and care-worthy, we are humbled by its ability to take care of its internal processes more holistically than alternative techno-scientific methods. Analogously, as students experienced "the fragility of the worlds we inhabit", and saw innovation and development counteracted by fragmentation, and resource asymmetry, they experienced the "the ongoing activities by which stability is maintained" [170], and how they as technologists and designers might participate in that careful balance. Furthermore, whether they started out as students, partners, or instructors, everyone's identities inflated into listeners, messengers, teachers, learners, and advocates. That fed into a collaboration that was "a collective achievement" [267], ethically-engrossed, and driven by "persistent tinkering in a world full of complex ambivalence and shifting tensions" [234].

Working with paper cards, "legacy" web platforms, and existing software tools, contradicted innovation as "the start of the technology chain, in moments of quasi-mythical origination" [170]. It tackled the "inescapable troubles of interdependent existences" [273]. As one partner put it, *"the win-win is knowing each other. The win is walking up that staircase together with you. This isn't about Cornell doing something for you or the island being genuine and welcoming people, this is about all of us together because we're all in this together whether anyone likes it or doesn't like it, this is the way it is. And we need to go forward with that."*

When the transactional transcended to relational, we co-constructed infrastructures, which is a "fundamentally relational concept" critical to participatory design [334]. Whereas technical skills are taught pervasively in course after course, societal membership is not; *"if not for the course, I would never have the chance to know those people, to have time to make conversation with local*

residents and have this relationship that we get to meet weekly and share our insights" a student explained. Once we accepted this interdependence, then in our "worlds made of heterogeneous interdependent forms", we found that "to care about something, or for somebody, is inevitably to create relation" [273]. When we run into each other now at the bus stop, subway station, supermarket, doctor's office, we all have a reason to engage in a conversation, to exercise care, and be accountable towards each other - instead of turning away, indifferent.

4.7.3 Technology was the Starting Point

We cannot forget that technology was a starting point for these conversations. As one partner put it: *"manpower is not necessarily something that we are looking for. It's much more, we run a business and every business these days has to have a strong tech department. What often happens with non-profits is they don't have that because they don't have the finances to support it."*

Farmers have a relationship with soil; students have no such preexisting relationship with the community. What they have is a desire to serve the community with what they know best: technology. Furthermore, students, partners, and community members being "differently positioned in their capabilities and readiness with regard to information literacy and ... technology use" [179] was a form of "social lubrication" [201] that helped interactions flourish and discarded in its manifestation "the positivist [HCI] tradition of producing an unambiguous result" [289]. Remaking emulated Light and Akama's design model where designing "is no longer led or owned by designers, but becomes a co-articulation of concerns and issues in a world

highly mediated by technology" [201].

Furthermore, if making time for care as a goal seems disengaged from the futuristic techno drive, what if we see it as a form of "ancient wisdom" for instilling ethics of care in tech programs or as an alternative ontology within the innovation paradigm? It (1) has the tension, tiresomeness, and messiness of wiring circuit boards, cleaning training sets, and debugging code, (2) is as non-linear as the innovation trajectory itself, (3) it galvanizes our imagination and problem-solving neurons, and (4) it is real: care after all is "a necessary everyday doing" [274]. While most technology curricula "suspend and compress" the present, Remaking distended the present, "thickening it with a myriad of demanding attachments" [274]. Fear, urgency, and output had to be distanced in order to focus on caring, and it was repetition and commitment that helped navigate the restless anxiety of the ambiguous.

I hope that this bricolage of technology-time-care is reflected in the students' future work and careers, and that the complex relationships of people to each other are considered within participatory design practice as "embodied, located, and emergent" [8]. After all, it is increasingly accepted that design activities do not "specifically involve the making of digital products or services as a means of structuring relations, but instead, they attempt to co-design awareness and understanding, and scaffold connections among people, some of which may manifest in enhanced design, deployment, customization or use of ICT" [201].

4.8 Limitations

Despite the positive interviews and course evaluations, the course was not without its pitfalls. Not all of the service projects led to a successful outcome. Students had to work hard to overcome or work around mistrust (e.g. partner declining to divulge credentials for students to access their social media accounts), skeptical board members (to approve proposed service projects), and communication hiccups (e.g. forgotten meetings). They also had to demonstrate commitment and set boundaries (e.g. partners expecting our institution to pay for licenses). In return, some partners felt the students, while "*brilliant*" and "*work too darn hard*", did not have the skills the partner really needed to advance their organizational mission.

It also not clear how to qualify or measure the care emerging. Our findings are based on observation and interview data: through crossing to uncomfortable and unfamiliar worlds, discovering ways to relate to the community through hobbies, food, and events, maintaining patience and persistence when facing resource limitations, and prioritizing the organizations' needs over their own were some of the ways students demonstrated care. Clearly more work is needed to explore different pedagogical approaches to cultivating care and studying the results empirically.

Furthermore, not all of the students appreciated the pedagogical goals and values of the class (perhaps that is why some of them declined to be interviewed). Some students felt that they were being used to improve the image of our institution on the island. This is a justifiable sentiment if students did not appreciate the soft skills they acquired, what they learned as citizens

and human beings, or how these skills would (or would not) translate into direct economic benefit for themselves and their future projects – especially on a campus founded on notions of innovation-driven entrepreneurial activity. We observed this tension first hand as students completed the course and moved on to their other endeavors. As far as we know, none of the students continued their projects beyond the class. It is an open question how long their relationships will last, although we do know of a few instances where students and partners are still in touch.

In some ways, the legacy of Remaking the City lies in the relationships that have already outlived the projects and artefacts as friendship and mentorship, and the good will created on both sides of the university-community divide. The issue of sustainability though leads us to ask: what is next? Robertson and Wagner draw our attention to the ethics of envisioning the future in participatory design, recommending that "increased attention be paid to the ways that design is completed as a way to contribute to resolving ethical issues/conflicts that arise in use" [287]. But we also share Akama's emphasis on the design of relations, which is "intangible, on-going and never completed, spreading through encounter and exchange"[201], which, as shown in this paper, takes significant time and effort on both sides.

4.9 Conclusion

In this paper, we discuss how we introduced care and care time within a futurity-driven graduate technology program through service learning pedagogy. We showed how the course became an "initiation ritual" between

a brand-new campus and its skeptical community. Through the deliberate incorporation of ambiguity in the course, what started as an endeavor to engage students in responsible citizenship and help local civic organizations improve their technology infrastructure, culminated with building relationships, transforming roles, and all of the involved parties expressing acts of care towards each other. The course created a structured entry point, a purpose, a timeslot on busy calendars, and a context for "strangers" with shyness and other social limitations to enact care with new people who may become their friends, neighbors, and future design targets. Finally, starting with Puig de la Bellaca's invitation to consider care in more-than-human relations, we showed how this can be operationalized in a more-than-university context. We invite the community to consider what would be the care vessel and time constructs for other contexts because "to care about something, or for somebody, is inevitably to create relation" [273].

CHAPTER 5

**AGONISM WITH YOUTH: CONFRONTING DIFFERENCE WITH
RHETORICAL UNMAKING**

This chapter showcases a design-based approach to difference that neither hides it under consensus-building nor tends to it with care. Design has been used to contest existing socio-technical arrangements, provoke conversations around differing concern, and operationalize radical theories such as agonism, which embraces difference and contention. However, the focus is usually on creating something new: a product, interface or artifact. This chapter reports on what happens when unmaking is deployed as a deliberate design strategy in an intergenerational, agonistic urban context. Situated within a civic design summer program for some of the youth who had taken Meaning of Home, this chapter reports on how they used unmaking as a design move to subvert conventional narratives about their surrounding urban context. This led to conflictual encounters within the program and at the local senior center. Compared to the other making-centric proposals, unmaking expectedly received less favorable feedback but it raised the most important (and difficult) discussions about differences in intergenerational urban priorities and how to approach them. This chapter proposes (critical) unmaking as an important yet overlooked design move that should be in the repertoire of tools available for conversations around design-mediated difference.¹

¹This chapter is based on an article published at the ACM Conference on Human Factors in Computing (CHI), 2022. Full citation can be found here [299]. I have permission from my co-authors and the publisher to use the work in my dissertation. Copy of the publisher copyright permissions are in Appendix C.

5.1 Introduction

It has never been more important for citizens to be involved in directing the course and pace of social change, especially with the plurality of needs that they have which may not be supported by hegemonic orders. The grand societal challenges that we face – including climate change, racial and social inequality and environmental collapse – demand collective solutions that can address a multiplicity of local and specific needs. Young people have often emerged as the leaders of numerous civic movements, forming global coalitions and taking situated and provocative actions in response to the perceived widespread apathy of public authorities. This chapter sheds light on the social and designerly ramifications when youth use potentially fractious strategies as provocative design moves within an informal pedagogical context to articulate their urban priorities. In particular, this chapter calls attention to the critical and democratic affordances of *unmaking*, and argues for it as a central if neglected aspect and potential method of socio-material encounters around difference in design.

Design as Provocation [148] refers to a multitude of approaches that use design to critique existing socio-technical arrangements [24], surface matters of concern [83], imagine radical futures [89], and operationalize theories from other fields. Within the critical provocation project, a multitude of constructs such as critical making [278] have expanded the mandate of design from definitive, status-quo-affirming resolutions [89] to engagements around issues, some for which "no consensus exists" [278]. These moves are paralleled by recent developments in democratic theory itself, where democratic procedures seeking universal rational consensus, transcendence over difference, and

assimilated/dispassionate/disembodied voices [144] are countered by others embracing dilemmas [160], paradoxical politics [67], and multiple modes of articulation [384]. This shift is exemplified by *agonism*, which as articulated in chapter 2, is a political theory that critiques deliberative, consensus-oriented democratic models for ignoring the antagonistic nature of human relations, and sees "forceful but tolerant disputes among passionately engaged publics" as healthy, productive, and necessary provocations for a pluralist democracy [36, 241].

Youth are natural provocateurs. They are always unmaking and remaking themselves and their worlds from the multilayered positions of radical hope [227], uncertainty [71], responsible citizenship projections [225], and social engagement on their own terms [227]. Their look on the present and future, coupled with their spontaneity, imagination, and appetite for adventure puts them in a unique position to try new things when approaching the world as designers. Still, in most of the literature on designing for agonism (and provocation more generally), the designer role is usually played by professionals or specialists (adults) of some kind: artists, product designers, researchers, or civic activists. There is little empirical work investigating how youth can and do spontaneously appropriate and deploy design as a way of critiquing current systems, contesting existing social arrangements, or proposing radical alternatives [162, 362].

This chapter sheds light on youth engagement with agonism and (un)making by exploring the conflicts arising during a middle school summer program titled CivicDIY for urban youth in a major American city. The program was a follow-up to the Meaning of Home unit (chapter 3) we taught at the

youth's middle school during which they gathered intergenerational data to surface a common narrative about what home meant to their community. The youth joined CivicDIY to refine the data, translate the findings into design interventions, and present their visions to older community members. One group proposed the destruction of a historic building turned luxury condominium in the community. Their unmaking proposal was unfavorably received, generating a conflictual intergenerational confrontation around irreconcilable land use priorities - which stem from generational and socio-economic differences. At the same time, proposals that entailed making (virtual or physical) were much more favorably received but did not raise the same kinds of issues around difference. Through an analysis of these proposals and the reactions they received, this chapter covers the design choices made by the youth, how those choices manifested their values and priorities in material form, how older adults responded to these proposals through a fractious dialog at the local senior center, and how this interaction expressed broader concerns around land use, equity and other sources of inherent intergenerational conflict.

Further, the empirical data of this ethnographic account is used to inductively develop concepts around agonism and unmaking. Specifically, we propose² a new move in the design for provocation space, that we call "critical unmaking". Much of the prior work on designing for agonism [36, 82, 158, 183] leverages the making and construction of visualizations and prototypes in "a provocative manner that purposefully deviates from familiar configurations" [82] to surface contestations and conflicting priorities. In a similar vein, Ratto's

²In the majority of the dissertation, the pronoun "we" refers to my advisor and I. In the context of developing critical unmaking, it refers to the doctoral committee and myself collectively. It was my advisor who suggested this term. After deliberations and refinement with my other committee members, we all agreed on it, so this "we" is more encompassing than others mentioned in this chapter.

work on critical making [278] offers a particularly salient vision, through direct engagement with provocation, theory-building, material practice and critical reflection, and a commitment to contingent and open-ended making processes that center the experience of making more than the result. Instead of making, CivicDIY offers insights on the critical affordances and rhetorical power of *unmaking*, which is the act of undoing, disassembling, or destroying, as a design move for provocation or agonism. We call this kind of unmaking, that is doing the critical work of provocation generally or agonism more specifically, *critical unmaking*.

Findings from CivicDIY also help us reflect on several additional questions around designs for provocation. Since these designs are often a critique of *someone or something*, what happens when the designs are shared with those who may not agree with them? These are difficult conversations to have, especially if there is some fundamental underlying *difference* among people or groups viewing the issue. How is design used as a rhetorical move within these spaces? What if we recognize unmaking that is done on its own terms, unobscured by any design/making imperatives, as a design move? How do these moves surface the underlying intergenerational, intercultural and/or socio-economic tensions that characterize all urban spaces? And how do other people react to the uncomfortable tension that is inevitably created when potentially threatening ideas are introduced in material form?

This chapter makes three contributions. First, it provides an ethnographic account of how youth leveraged design to communicate their priorities and concerns such as the need for fun, social justice, and intergenerational arenas. Second, this chapter introduces critical unmaking and compares it to making

and the work each does in navigating diverging priorities. Third, this chapter offers a reflection on the methodological and pedagogical implications of critical unmaking as a design move for provocation, particularly the need to protect agonistic practices, care for participants, and consider possible "complications" [15].

The rest of the chapter is organized as follows: it starts by positioning this work at the intersection of design as provocation, fractious interactions with/through design, codesign with youth, and the growing literature that has begun to leverage the affordances of unmaking in design. It then narrates the CivicDIY youth internship through two ethnographic episodes: the youth design process and outcomes (section 5.6), and the final presentation at the senior center (section 5.7). In the findings within each episode, I analyze the values and aspirations inscribed in the artifacts involved and the agonism arising during that episode. Section 5.8 then synthesizes the two episodes by identifying three forms of (un)making underpinning the youth proposals and contrast their affordances as provocations. This is followed by a discussion of how critical unmaking leveraged by CivicDIY youth diverges from unmaking as typically characterized in design. The discussion section articulates the resulting methodological and pedagogical implications, including the need to recognize it as a move, and why in certain contexts it can do agonistic work that strictly constructive approaches cannot. The chapter concludes by reflecting on how to approach tensions arising through and around agonism and unmaking.

5.2 Designing for Agonism

Agonism is a political theory that envisions a distributive power where "anyone, anyone at all" can step "from below" to confront dominant orders and carry out a contestational struggle [217]. It arose in contestation to more amiable/procedural versions of democratic theory such as Habermas's deliberative model [144] which emphasize rational, consensus-based decision making. Agonism in contrast recognizes that citizens have different and even conflicting conceptions of the good, and that rational consensus is a fragile façade that both narrows the range of allowable political expression (including in ways that elevate or demote particular voices and groups) and conceals the presence of violence, repression, and antipathy. As argued by theorists such as Chantal Mouffe, the real threat to democracy is when "the ineradicable character of antagonism" is eradicated in the name of "universal rational consensus" [238]. Agonism envisions citizens in democratic societies engaging "in many different purposive enterprises and with differing conceptions of the good," but submitting to a set of common "ethico-political" values [237]. This engagement is in lieu of communicative norms that channel and order political expression into implicit speech hierarchies that fit and serve some groups more effectively than others [384]. Agonism also admits that power and exclusion can never be completely erased, so they must be made visible and contestable. Such egalitarian vision and embrace of contestation in agonism requires permanent spaces for conflicts and confrontations, where various members of the public engage in passionate disagreements and dialogues that tinker with orders and hegemonies not rooted in their conceptions of the good. A healthy agonistic democracy is thus always expanding the "repertoires of contention" [346],

offering up alternate and expanded modes of expression that bring new or heretofore marginalized political voices and actors more effectively into the realm of democratic practice and contestation. The frictions that these new and expanded forms of inclusion give off become in part the engine of democratic novelty and invention.

Several researchers [36, 82, 158, 183, 331] have explicitly or implicitly taken up designing for agonism. The goal of such design is not to produce marketable solutions, but to surface questions, conflicts and different points of views, as well as support contestations and citizen assemblies. Building on agonism ethos, DiSalvo argues that if "we abandon the notion that any one design will completely or even adequately address our social concerns or resolve our social issues, then adversarial design can provide those spaces of confrontation — in the form of products, services, events, and processes — through which political concerns and issues can [be] expressed and engaged" [82]. Similarly, Björgvinsson et al. envision agonistic public spaces where participants designing together engage in constructive controversies that open up "new ways of thinking and behaving" among adversaries [36].

While agonism embraces conflict, it seeks to defuse and divert destructive forces to achieve a "pluralist democratic order" [36, 82, 237]. DiSalvo therefore emphasizes that: "... rather than framing the conflict as among enemies that seek to destroy one another, the term adversary is used to characterize a relationship that includes disagreement and strife but that lacks a violent desire to abolish the other" [82]. Designs for agonism are generally prototypes, exhibition pieces, and online tools. This affords them a natural safety buffer between conflicting sides that prevents conflict from turning violent. These designs *make* (e.g.

social robots, data visualizations, ubicomp systems) with a "speculative" and "spectacular" sense of aesthetics to entice public engagement [82]. And they are generally rooted in the traditions of making, and envision desirable outcomes that are often already widely accepted in a particular society.

CivicDIY was designed following the tradition of critical pedagogy and participatory design as emancipatory processes that foreground what the youth see, feel, and discover in their everyday experience while engaging with larger issues around urban priorities and justice. It was not intentionally planned to design for "agonism". But as the youth appropriated this space, the program turned into an agonistic context, whereby they continuously stepped up to recast what a good or desirable program outcome would be, and transformed our role from teaching to supporting them as they blaze "a different kind of politics" around spatial use [43]. The social dynamics of how youth claimed the space and agonism emerged are discussed in section 5.6.2.

By maintaining a persistent "agonistic struggle" [241], the youth also proved that making as design may not suffice when contesting or maintaining the strife with a *different other*. Critical unmaking organically emerged in this pedagogical design context, and served three purposes: expressing "matters of concern" [83], raising questions around island use and equity, and contesting the state of the surrounding urban context. As the rest of the chapter shows, critical unmaking as a provocation proved not as palatable as we see in the design for provocation or agonism literature, but it met agonism right at its mandate of surfacing questions and contestations.

5.3 Related Work

5.3.1 Design as Provocation

Hansson et al. [148] use Design as Provocation as an umbrella term to refer to a multitude of design constructs that use digital and physical mediums to draw awareness to social, cultural, and political issues and provoke critique and discussions [148, 362]. This includes reflective, speculative, critical, and adversarial design (among others). Dubbed by its authors as a "technical practice" within the "critical project", reflective design seeks to continuously bring out the unconscious through design processes and interactions [317]. Speculative design draws on "rigorous analysis and thorough research" yet loosens the reign of "official reality" to enable the social dreaming of new possibilities [89]. Design fiction also tells speculative stories about "future things" through physical objects that "stand in for that future and refer us to it" to elicit lucid imagining and pondering [37]. Critical design is concerned with scrutinizing the designers' ethical objectives and generating new design values and theories [24]. It can resort to extremity [124] or taboo to make critical commentary, as in the Menstruation Machine [25]. Taking a more explicitly political stance, adversarial design uses "cultural production", "movements and genres", "practices and objects", "products and services", and "our experiences with them" to enable agonism [82]. Lastly, critical participatory design is concerned with the insights about power and positionality emerging from participant interactions during the design process to "mainstream the role of individuals ... towards the achievement of ... specific targets that they have reason to value" [342].

Perhaps most relevant to this work, critical making is a technique that emphasizes the design prototypes as "a means" to better understand socio-technical issues through collective construction, conversation, and reflection [278]. Here, the focus is on the experience of designing, and the reflection and discussion that process can generate, more so than the result. Our emphasis is similar with critical unmaking, in that we are interested in the conversations and spaces that can be opened up by its rhetorical power, rather than necessarily being committed to unmaking as a desirable end goal or result. But where critical making emphasizes the "shared acts of making"[278], critical unmaking calls attention to what can be surfaced only by removal, take down, or deletion.

Design as Provocation is often applied in participatory settings to bring people together "through and around" matters of concern to envision futures and map out change [194, 83, 92]. Because such design contexts encourage discussion, participants often play an active role, revealing their contentions, controversies, and attachments [148]. This entails many challenges. One pertains to the role "professional" designers are supposed to play: build interventions based on participant insights, support interactions among them without leading too much, or bridge their expertise with powers of change [212]? Another is how to seed "discussion, ideation and anticipation", especially if the issues are vexing [362]. A third is how to cultivate the critical project among participants who are not trained designers [269] or might prefer other modes of expression. In the CivicDIY case, these three challenges coalesced, particularly as the issues the youth worked with reflected underlying differences that influenced their design priorities.

5.3.2 Friction in/through Design

We find fractious encounters arising in three forms in design literature: as unanticipated interactions, through designerly things, and within deliberate agonistic contexts.

Design researchers have recorded numerous examples of unexpected conflict arising in design and CS. For example, Arawjo et al. bring up the social complications emerging when youth in a programming course for refugee communities designed a game based on xenophobic ideas [15]. Vakil et al. highlight incidents of CS classroom microaggressions, calling out the "reductive, depoliticized perspective on learning" in STEM [357]. DiSalvo provides an account of disagreement among community members around installing pirated radio [81]. Design scholars bring up the "breakdowns" of designer expectations [26], tensions around non-traditional use of making tools [27], social discomfort [26], the negotiation of designer-participant roles [339], and whether there is a "compliant participant" who follows "specific moral imperatives and raises specific normative expectations" [270]. Others shed light on how insights of marginalized participants might be subsumed as irrelevant despite the organizers' good intentions [356]. These works generally agree on the need for "better models for how to do community-based design research in the context of contestation and radical pluralism"[81].

The second form is through artifacts designed to intentionally raise opposition [200], destabilize [150], and provoke citizens to pause, reflect, and question the status quo [183]. Clement et al. for example propose custom government ID overlays which contest information overshare [63]. Natural Fuse, a web of households connected through smart plants, creates

tension among system users over selfless power consumption versus selfish consumption which kills plants in other households [82]. The conspicuous design of *ScreamBody*, which records and releases the user scream later on when appropriate, challenges the "social repression" necessitating its very existence [85]. Finally, Dunne and Raby's dark designs use "[n]egativity, cautionary tales, and satire" to "jolt the viewer out of a cozy complacency"[89].

The last form of fractious encounters is through "agonistic public spaces" [34] where design activities center controversies and pluralism among participants working together [148, 239]. The Malmö Living Labs is an example of such arenas where the designer role becomes that of supporting such assemblies with potentially conflicting interests (e.g. occupation of Palestine), legitimize the marginalized (e.g. immigrant youth NGOs), and provide technical training [35, 36]. This work builds on each of these traditions by exploring both the self-discovery and the unanticipated conflict that can occur when designerly things are deliberately used as provocations within an agonistic context.

5.3.3 Co-Design with Youth

CivicDIY was designed following the tradition of critical pedagogy rooted in the youth funds of knowledge [132]. Education and learning sciences provide many approaches that center the youth lived experience. Scholars argue that civic participation as traditionally defined and constructed tends to privilege "adult perspectives on what youth should be doing ... rather than asking young people what actually engages them" [226, 251, 304, 385]. Others have found that young people typically favor expressing themselves through producing content

rather than consuming it and thrive on conversations around the insights they find [33, 175]. Critical pedagogy facilitates learners bringing in the social and political aspects of their lives to critique, reflect on, devise civic action, and imagine alternatives beyond past and present limitations [113, 128, 228]. Building on this tradition, Social Design–Based Experiments (SDBE) probe the cultural historical means of vulnerable students and "the social situation itself" to instigate change through co-design, deployment, continuous co-reflection, and co-revision [140, 141]. Educators have also leveraged civic dreaming [225], speculative literacies [227], storytelling [177, 383], spatial interdependence [304], visual spatial representation [96, 229], mentorship [127], and the affordances of the "third space" [139, 358] to engage youth in social change and critical inquiry.

Youth-led Participatory Action Research (YPAR) focuses on agency by placing youth in the driver's seat to address issues that matter to them be it in scoping, data generation, analysis, or dissemination [54, 76, 103, 105]. Mainsah and Morrison advocate participatory design to meet youth at their autonomous and self-forming ideals, and connect them to structured institutions of civic engagement [211]. Druin et al. explore co-design with youth, fusing participant observation with participatory design to channel the youngster's blunt opinions and insights to improve technology design for both children and adults [87, 88]. Garcia et al. find that Black youth view their participation "in the institutions and decisions that affect their lives" as an empowering counternarrative to racial misrepresentations [123]. Finally, the process of design and physical making with youth and the mistakes made along have been found healthy for experimentation, problem solving, and exposure to diverging preferences [38, 142, 363].



Figure 5.1: Mapping activity where youth marked the island usage patterns, visions, and sentiments (left) and final presentation at the senior center (right)

5.3.4 Unmaking

This work engages with ongoing conversations in design that recognize and utilize unmaking as a move. Designers and researchers have leveraged unmaking in numerous creative ways in art [369], photography [219], education [135], game design [94], fabrication [243, 333], technology repair [172], disassembly [283], environmental sustainability [116], and artful activism [293]. Recently, a slew of "un" practices such as unmaking [333], uncrafting [245], unfabricating [382], and undesigning [268] has heralded a discourse geared towards experimentation with objects, features, and materiality. Song and Paulos propose unmaking as "the destruction, decay, and deformation — of physical artifacts" [333]. Their formulation posits unmaking as a valuable extension to making, achieved by digitally designing and fabricating objects that unmake in pre-defined ways post-making. Wu and Devendorf [382] develop a pipeline of hardware, material modifications, and digital design tools for unfabricating smart textiles to sustainably mend, disassemble, and reuse them. Murer et al. propose uncrafting as "the thoughtful, reflective process of disassembling ... something which could be developed into a practice that – not unlike other studio crafts – requires particular skills, involves specific

ways of reflection, and develops and according set of terms and framings" [245]. Uncrafting is geared towards material exposition, inspirations drawn from its inherent components, inquiry into the underlying design, and form-function exploration. Lastly, Pierce formulates undesigning as "the intentional and explicit negation of technology" attained through a range of strategies such as inhibition, replacement, and erasure [268]. Our formulation of critical unmaking builds on the rich potentiality identified in this literature, but is embedded more in social processes rather than physical matter, and activated at the confluence of the design as provocation, friction, and co-design with youth.

5.4 Background and Motivation

Our campus is located on a small residential island within a major American city. After serving as home for various "undesirable" institutions such as a "poorhouse", a mental health institution and a smallpox hospital, the island was revamped in the 1970s as a mixed-income residential community. Today, it is home to a large number of immigrants and expatriate families, although gentrification is gradually changing the island's socio-economic and racial composition. A large population of adults over 60 also live on the island for many reasons including subsidized rental units, minimal car traffic, quiet floors in some buildings, and a thriving senior center. As described in chapter 3, in the Spring of 2018, we developed and taught a 7th grade social studies unit using oral histories as a methodology at the island middle school in the vicinity of our camps. The students interviewed their parents and other community members, finding through qualitative data analysis a ubiquitous need for increasing social cohesion on the island. We followed this by implementing a summer program

to continue working with selected youth on translating these ideas and findings into physical and digital solutions. This chapter reports on the latter activity.

5.4.1 Student Recruitment

We announced the summer program, titled Civic Design Internship for Youth (*CivicDIY*), at the end of the school year. Each student was promised to learn some skills that would help their high school application, regular snacks, a certificate of recognition, and a \$50 Amazon Gift Card. We eventually ended up with a summer cohort of 7 students. Five males: Aditya, Adnan, Khalid, Ferguson, and Usama and two females: Layla and Maha (all names are anonymized). One student was of a Latin American origin, one Arab, and five South Asian. Four of the students reported practicing Islam, one practised Christianity, and two Hinduism.

5.4.2 Program Structure

The program met each Friday for six weeks during June and July 2018 from 10am to 4pm. We convened and worked in our research lab on campus, which has a large multi-purpose space with movable chairs, tables, whiteboards, and pin-up walls. Most of the program activities happened in that space, but sometimes, we took the youth to the fabrication lab across the hallway, attended events in other parts of campus, or went for field visits on the island.

The morning session was used for homework debriefings, seminars, and guest lectures and the afternoons for site visits, prototyping, and pinup reviews.

The youth had homework such as doing extra research on their assigned part of the island, interviewing users, and producing sketch models. Some youth opted to drop into our fabrication lab between the Friday sessions to finish prototyping. The program goal was to supplement interview findings from the pre-CivicDIY school project with site data, and then prototype design interventions informed by the collective findings. A couple of weeks into CivicDIY, the organizing team saw that building a physical model of the island could be useful for future co-design sessions. A communal fountain proposal also seemed from our perspective like a good way to coalesce everyone's needs. We hoped to produce one and take it to the island's governing body which was offering funding for community enhancing projects.

5.4.3 Pedagogical Design

The program included history and case study seminars, site visits, user observations, and mapping to help youth probe the island critically and tie its spatial aspects with possibilities for social and technological interventions. The basic design principles of CivicDIY were as follows:

- **Treating Youth as Experts:** We wanted youth to surface and use their expertise to execute the internship goals. Therefore, we engaged them in complete research, analysis, ideation, and prototyping cycles. The activity generating most design insights and ideas was a large-scale island map (Figure 5.1) on which we reflected on what could be added, removed, celebrated, or augmented. After three cycles of research and prototyping, the youth had the freedom to come up with whatever they felt improved

social cohesion on the island.

- **Collaboration:** The youth were allowed to work in groups, rotate, regroup, and brainstorm together. During breaks, they indulged in bickering, joking, sitting on the floor, holding rolling-chair races, speaking to other people on campus, and flying paper helicopters down the atrium. These activities served as auxiliary opportunities for cross-pollinating ideas.
- **Frequent Feedback:** We held individual desk crits and group reviews every session to make sure the youth were making progress. Pin-ups served as a medium to both critique and speculate as a group on what it is like to use, live in, or own the ideas presented.
- **Exposure to Other Ideas:** We held 15-to-30-minute seminars every week covering precedent cases from our own work in architecture, ubiquitous computing, and ICTD. Youth learned about the urban renewal phases the island went through, and saw the built and speculative master plans by renowned architects such as Koolhaas. We also took them to watch design guilds on campus, visit other research labs, and engage with the tools and models in our fabrication lab.
- **No Formal Evaluation:** We set no requirements to obtain the certificate of recognition and gift card other than regular attendance, completing all activities, delivering the final presentation and participating in an exit interview. The intention was to shift focus away from competition and metrics to issues and engagement.
- **Intergenerational and Intercultural Communication:** Incorporating a visit to the senior center emerged during a conversation with the center director as we sought ways to pluralistically probe the internship



Figure 5.2: Youth proposals rendered on the Pinnacle (an alias for an island condominium) site: virtual reality zoo/cultural center (left), spa kingdom (middle), and destroying the Pinnacle (right). Renderings produced by authors

outcomes. She lamented that researchers interview her members about their health needs "all the time", but never come to talk about fun or social aspects. She also mentioned that older adults love it when young people visit as it livens up the center and reduces the stigma associated with such places.

5.5 Methodology

This chapter is based on the firsthand experience of my advisor and I developing and teaching CivicDIY. The data collected includes 38 hours of observations, dozens of textual and design artefacts generated during the internship, 7 semi-structured interviews with the students conducted a month after the program concluded, and audio recording of the final presentations at the senior center. We took extensive field notes during class activities, field trips, and informal conversations. There were generally three types of observations in these field notes: (1) summary of student ideas, proposals, questions, and

opinions, (2) details of their reactions and ours to the activities and interactions during the program, and (3) the way they interacted with each other, the research team, and the older adults. Participants gave consent to be audio recorded during the informed consent process as approved by our institution's IRB.

I transcribed the audio recordings and imported transcripts into QDA Miner Lite for coding and thematic analysis. Myself, my advisor, and a research assistant then independently read each transcript, assigning a code to every sentence (open coding), focusing on interactions, design processes, and perceptions. Example codes included "creative freedom", "conflicting visions", and "functional redundancy on the island". Once consistent codes began to emerge, we drafted the first round of codes and tentative categories such as "fractious encounters and backlash" and "physical change is disruptive". We then reflected on the codes, discussed our different perspectives on how the youth appropriated civic design, and conceptualized preliminary themes around agonism and unmaking through reflexive thematic analysis [44]. At this point, the themes were read alongside and compared with theories of agonism based in the literatures described above – specifically Mouffe [237] and DiSalvo [82]. The chosen themes were further supported by triangulating evidence from fieldnotes and student artefacts and discussing them with the research team through the lens of agonism. After three iterations, the themes of "agonistic encounters" and "designing with (un)making" were agreed upon and were further iterated and refined along with the codes.

5.5.1 Positionality Statement

As mentioned in chapter 1, I am a Middle Eastern female with research experience in urban planning and design, and was the primary field researcher in CivicDIY. Prior to this project, I had worked with youth, but in settings that left little room for defiance. This inexperience with the youth independent spirit, coupled with my professional training in architecture and engineering³, and a cultural upbringing focused on compliance and hierarchical structures, impacted my approach to this project in two ways. The first is by trying to bring youth back on a normative design trajectory I felt might appease the island community best (as narrated in section 5.6.2). The second is by sensitizing me over the course of data collection and analysis to the youth process of claiming voice and agency as experts on their needs, the value and ramifications of that, and the emancipatory essence of agonism. My advisor is a South Asian male with extensive experience designing and running informal education programs for youth. He was therefore familiar with program plans going off-course by youth claiming design agency. Further, both of us were residents of the island when the program and study was conducted so our interpretation of the youth activities is informed by other interactions with them.

The following two sections narrate the internship process chronologically, focusing on two ethnographic episodes: 1) the students' design proposals, and 2) their presentation of these proposals at the senior center. After each episode, I discuss the key observations and findings that resulted. The subsequent sections in this chapter synthesize the themes and ideas appearing across the episodes, and their implications for design theory and pedagogy.

³Two fields structured by expert knowledge in systematic ways as discussed in the introduction to this dissertation

5.6 Episode 1: Design Proposals

In the early ideation stages, the youth proposals revolved mostly around tech-based artifacts such as smart flying pencils that sharpen themselves for kids with disabilities, an automatic chair with luggage storage for older adults, and a headpiece with auto-translate chip for English language learners. Eventually, as the youth gathered more site data from the island, worked on their ideas collaboratively, and got feedback, they converged on more place-based and civic ideas that from their perspective enhanced social cohesion on the island. The final designs that the youth converged on were:

- **VR Zoo:** Usama proposed a virtual reality zoo in the park (Figure 5.2) accompanied by a garden and playground for those who are too young to enjoy VR. Everyone would wear the same goggles in the zoo but sees animals appropriate to their age (e.g. children under 10 only see petting animals). The goggles could also show cultural attractions.
- **Spa Kingdom:** Layla's project (Figure 5.2) proposed replacing the Pinnacle (an alias for a luxury condominium on the island) with a "spa kingdom" similar to a one she visited in the past with multiple pools, saunas, food, and race cars for kids.
- **BMX Park and Mall:** Maha proposed a two-story BMX complex with roller coasters, water slides, shops, and restaurants.
- **Underwater Train:** Khalid proposed an underwater train to a tiny island north of our island, with opportunities for snapping pictures of the riverbed and skylines.
- **Cultural Center:** Ferguson designed the center with both indoor

and outdoor spaces for holding cultural fairs in addition to daily programming.

- **Floating Shopping Mall:** Adnan and Aditya proposed a shopping mall floating in the river with an underwater aquarium, a walkway to the island, and a bridge to the mainland.
- **Destroying the Pinnacle:** Adnan and Aditya also proposed "destroying the Pinnacle" (Figure 5.2) without building anything else in its place. The Pinnacle is a luxury apartment complex on the island with amenities such as tennis courts, gardens, and an outdoor pool. It used to be a mental hospital and now houses the island historical society's office and two residential wings. One of the students, Ferguson, and the fourth author, both lived there at the time.

In the next section, we report on the specific values and aspirations the youth embedded in the design process and final proposals as a response to their urban experience.

5.6.1 Youth Values and Aspirations

The youth showed intimate knowledge of the island's built environment and its residents, knowing for example where dogs got into fights, who smoked weed and where, police routines, facilities conditions, and traffic risks, among many other unique local insights. During the internship as well as during data analysis, I noticed that their urban experience is defined by limited mobility, lack of youth-oriented community spaces, and getting "*yelled at*" by older adults and security for riding their scooters or being too loud. And while the island

has multiple swimming pools, playfields, and gardens, the youth revealed that they are either private, too expensive, or often rented out as emerged in the internship research cycles and interviews. The youth responded to these challenges with a loud, fun, and expansive set of proposals that frequently challenged the norms of the broader (and older) community. Reprimanded for running, playing, and talking too loud, they proposed even louder activities: roller coasters, swimming pools, and underwater tunnels, as well as destroying the most expensive rental building on the island. In general, their proposals highlight the following values:

Having Fun: The youth proposals chiefly target "fun" and "play" within safe social contexts. The mall uses *"empty space [the river] for like fun things"*. Khalid's underwater train adds *"activities on the island while also making it a more popular place for tourists"*. The BMX/mall concoction can *"...unite both kids and adults together ... to know each other and have fun..."* Usama describes the zoo as a place where *"you can have fun. You can play here while kids having fun in the kids' park"*. And Layla dubs her spa kingdom a *"fun and safe environment that is family friendly"*.

Intergenerational Compromises: In Layla's spa kingdom, *"kids can run off and have fun while the parents relax."* The spa has four swimming pools and two *"are strictly for adults only because kids can get very annoying, I know because I am one."* Maha's BMX park incorporates retail so that adults would enjoy shopping while kids ride. Usama does the same through a kid-friendly garden outside the VR arena so that young kids can keep busy while older siblings and adults enjoy the experience. And the mall provides necessities and a variety of food options everyone on the island needs. The proposals would have ample security so that

"parents won't have to have their kids in the back of their head like oh my god what is my baby doing right now?" There would be spatial buffers (mall in the river, VR zoo in the park, spa on the spacious Pinnacle land) so that residents won't go *"are these kids screaming? I'm trying to sleep."* The proposals are also all located away from our institution because *"college students need to concentrate"*.

Social Justice: With high rent and gentrification driving away the middle and lower class from the historically mixed-income island, the youth reported that more and more of their classmates were leaving the island school and relocating to more affordable neighborhoods. The youth communicated that concern through a range of moves: Aditya and Adnan kept teasing Ferguson because he lived in the Pinnacle but *"doesn't have to pay rent"* (as it is covered by his parents' job) and criticizing the Pinnacle for its *"really rich"* and *"exclusive"* vibe. When they pitched destroying the building as their design proposal, several other students either tacitly or explicitly endorsed it. The youth also noticed that *"there are a lot of apartments on the island"*, whereas fun spaces for them are non-existent, so it is only fair that their priorities are taken into urban planning consideration. Usama comments: *"these students [referring to himself and his classmates] know how to change the world because they are the future and these generations [adults and older adults] will be over age and they won't be able to control the world. So it has to be us who make the world better and better."* Layla echoes this sentiment in her interview, noting that *"there's a lot of adults but the amount of kids that are on this island are a lot... I feel like that's something that's so important nowadays: letting kids, because we're the future, so it's like you need to let younger people speak."*

5.6.2 Civic Design Turns Agonistic

The design encounters with youth speak to the dynamics identified in some of the theoretical literature on civics. Lefebvre laments the detachment of civic engagement from everyday life and its confinement to privileged moments of lucidity or action such as voting and public debates occurring infrequently and by invitation from political institutions [198]. The youth proposals reflect a different form of civic participation, rooted in their daily urban experience, aspirations, and values rather than "socio-spatial norms" [388], or what is considered right by authorities or "good" in the view of adult design researchers. Through the bricolage of their proposals, the youth accounted for the community's intergenerational and polyethnic makeup by including activities for others, and by providing for security and spatial buffers. They articulated how they "want to live collectively" [320], including with parents, older adults, the local police, as well as the government and other civic institutions. But their articulation, in the form of entertainment and adventure venues, shift from civic to agonistic design by passionately challenging what "does not fully appear" in the current pattern of rules, institutions, and customs and makes a case for why it must be recognized [36, 241, 255].

The youth started out shy, expressing trepidation about what they could propose since they were "*just kids*", and opting for decontextualized tech-based ideas. Through research and design iterations, they quickly realized that they spent a lot of their time on the island and possessed unique lived expertise on it. During the mapping exercise alone, they shared over 60 insights about how the island is used and governed, such as the frequent closure of public sport fields for private rentals. This placed-based knowledge recentered their focus from

gadgets to urban-oriented designs. It also bolstered their confidence, propelling them to seek agency as young citizens by designing based on their collective top priorities: socializing and having fun.

This prioritization clashed with my own goals for the program, which implicitly supported more subdued, formal, and adult-centric ways of social interaction. The youth resisted these implied priorities with insubordinate behavior (e.g. refusing certain feedback or tasks), persisting with the destruction proposal, and building coalitions among themselves. Subversion reached a critical junction when my advisor (the PI on the project) was out of town. I ran the weekly session, and prepared CAD plans to build a physical map of the island as agreed upon the prior week. The youth refused to build the model, choosing instead to proceed with prototyping their individual proposals. Even Usama and Maha, who were generally agreeable and diplomatic, politely turned down the task with "*perhaps later*". And they bypassed the feedback that an outdoor forum at the island's transit hub might be more usable than a VR zoo or BMX park.

Admittedly, I was furious. On that day, I conceded to their plans but called for an urgent meeting with my advisor to discuss the lack of exemplary "performance" the youth showed in the Meaning of Home project. I specifically wanted to deploy "compliance" mechanisms such as introducing grades and sending reminders to parents. During the meeting, I made the argument that the community needs doable interventions while "*we are wasting resources on these ... kids ... to produce ... privileged interventions that are useless for the island! How are we even going to take that to the senior center?*" My advisor however saw no problem in the youth deviating from planned course. Unable to resolve the

conflict, we discussed the motivations behind the youth adversarial trajectories and the values embedded in them. My advisor noted that the youth had valid concerns which they voiced many times over the course of CivicDIY: busy guardians, limited amenities on the island, lack of opportunities to express their funds of knowledge [132], and absence of social contexts to express their identities. He offered: *"Look, we can incorporate that [compliance mechanisms] here if that's what you want...but do you want a school or do you want a third space [358]?"* I eventually accepted to "stay with the trouble of ... representing the lives of people in the community" [351]. At that point, it became a sub-community: the youth's.

Layla celebrates their claimed sense of agency as young citizens: *"we got to look at the island, see an overview of the island, say things we could take out or put in, so we got that all based on our point of view and based on what we wanted. And we got to do our projects all like based on our opinions."* This agency led to agonistic encounters across multiple fronts: within the organizing team, between the youth and the organizing team, and between the youth and their families (one of the youth recalled a family member reacting to her proposal with *"oh I don't think you should create a roller coaster and shopping mall"*). As illustrated in section 5.8.3, it also led to conflict between the youth themselves as support for destroying the luxury condominium / historical landmark (where both Ferguson and one of the organizers / authors lived) was not unanimous.

5.7 Episode 2: Presentation at the Senior Center

Throughout CivicDIY, the youth mentioned seeing a lot of older adults on the streets (including sometimes getting yelled at by them for being loud), but not often directly interacting with them. To address this intergenerational and intercultural gap, we arranged for CivicDIY to culminate with youth visiting the center to interview the older adults about what the island meant to them as a home and to present their design proposals. There was no prior engagement with the older adults as CivicDIY was an internship for youth to learn and execute design, rather than an intergenerational internship or a public design initiative. In hindsight, the older adults not being involved in the design phase led to honest responses unfiltered by "performance" [131] or conviviality [320] norms.

The senior center director advertised our visit a week prior through a flyer and word of mouth and circulated a signup sheet. A total of 11 signed up and eventually 9 attended, including 8 female and 1 male. Attendees came from a wide range of ethnic and income brackets. Some of them had lived on the island for decades and were fairly involved with its governance. They also experienced firsthand its urban transformation (including various speculative proposals the city considered in the 1960s and 1970s for the island) and provided us with historical material on that which we taught during CivicDIY. While the older adults were not present during the program's research and design activities, many (especially the ones who were most vocal during the visit) were familiar with that legacy of speculative designs, provocative ideas, and the island history, including the prior loss of several beloved island buildings.

On the last day of CivicDIY, the youth practised their presentations in our lab. Then we walked to the senior center, set up snacks, sat around a table, and introduced ourselves. As an ice breaker, the youth individually interviewed the older adults for about half an hour about what home meant to them. After this, each team presented their design proposals for the island (Figure 5.1).

Adnan and Aditya volunteered to present first, proposing the floating shopping mall with an underwater aquarium. The older adults probed them on the engineering and policy challenges. To our surprise, Aditya then declared wanting to destroy the Pinnacle. In the ruckus that followed, the loudest voice was an older adult (a member of the island's historical society) exclaiming: *"Excuse me!! What's your problem with the Pinnacle?...Cornell Tech has lots of land... Don't fool with my lunatic asylum!"* The pair nonchalantly responded: *"We don't like it. Everything. It covers a lot of space."* Still taken back, the older adult followed, *"well what do you want to build in its place?"* The response came: *"nothing..."*

Layla was more diplomatic in her presentation, noting that she has nothing against the Pinnacle, but that it did occupy a lot of space that could better be utilized (in her opinion) by providing a spa kingdom that would help adults relax and keep kids from loitering and getting in trouble. The older adults again suggested it should be built close to our campus to keep it and its noise away from the buildings where they lived. They also suggested additional functions: *"How about ice skating? Seniors would love that [laughing at their own suggestion]!"*

When Khalid, the last youth presenter, gave his presentation about the scenic tunnel, the older adults, perhaps still annoyed by the first proposal, diverged from the idea with a discussion among themselves about the technical

challenges it entails and its relation to the river's geological history. One of the youths recalled in his interview feeling *"a bit afraid"* before the visit *"because they are way older than me, it'd be a bit hard for me to show people what I'll expect the world after the next generation."* The presentation validated that suspicion.

The most popular proposal by far was for the VR zoo. Usama opportunistically expanded it during his presentation to also include a virtual cultural center/museum. This on-the-fly adaptation encouraged the older adults to reminisce about places they grew up in or visited, naming landmarks that could be visualized, and the need to augment the VR system with a sense of smell, because *"Bombay and Paris do not smell the same!"* Unanimously, they described it as *"very good"* and *"excellent"* because then *"you can represent everybody's hometown"*. They even joked that *"the 5 year olds will go to the 25 year old [scary zoo] and the 70 year olds will go to the 5 year olds [petting zoo]."*

5.7.1 A Fractious Encounter

Post-event interviews with youth reveal backlash from their interaction with the older adults, and an expressed desire to work with a different demographic in future internship offerings. In commenting on the encounter, Aditya recalled that the older adults *"got mad when I said I'd destroy the Pinnacle and then they said that there's no need for the mall... because it'd just disturb them. It's [the mall] just sitting in the middle of the river and ruins the fact that there's a river there. They didn't get my vision...it was kind of weird [the visit] because; it just wasn't fun. I don't really know how to describe it... The people were fine, just what they said was kind of bad."* Khalid, who was excited that he would *"get good feedback and a*

different perspective,” reported his subsequent disappointment since the older adults focused on the technical and historical aspects: “I didn’t really get any feedback. They just said good job and I asked is there any changes and they were just clapping I was like oh god no. I didn’t get anything.”

In attempting to explain the friction, Khalid further noted that the *“elderly want something more peaceful; children want something fun; adults want something beneficial, and tourists want something that looks good. They each have different perspectives.”* When asked if we should do this again at the senior center, all of the youth said no, suggesting tourists, young adults, and our students because *“they understand like everything and don’t oppose things because they don’t have connection with the Pinnacle, so they won’t have an issue with destruction if it benefits them.”* Ultimately, all youth recommended removing the senior center visit in upcoming years and focusing instead on interviewing younger demographics who would appreciate their visions. I held a follow-up session with some of the youth a year after the encounter. They still held the same sentiment and opinion, saying they could go to the senior center as volunteers, but did not want to do interviews or present their own ideas.

5.7.2 Agonism within Heterogeneous Publics

CivicDIY served as an agonistic context [36], through which youth chose to conjoin due to concerns around competitive high school applications, spending the summer in *“math academies”* as one participant noted, and being left out of the urban narrative defined for their community. Difference within the youth assemblage comes from many sources including ethnic, religious, and

class diversity, fueling the controversial desire to destroy a classmate's home. Another assemblage was the youth-older adults, which CivicDIY helped bring together due to both sides feeling excluded from urban issues and wanting to "see more things from other people's perspectives." The older adults cherished quiet, nature-permeated, non-touristy, and relatively static neighborhoods, while youth wanted fun, stimulating and dynamic places. The older adults, many of whom were immigrants, saw the island as a haven that should stay as is since it is already "way, way, way better than where they originate from" as Adnan put it. They were predictably resistant to any proposals that advocated for rapid or destructive change, much less the destruction of a notable and important local historical landmark. These underlying differences in perspective and priorities became agonistic once materialized, because they candidly allowed conversations, concerns, and deep reflections to surface about what it means for different community groups to share urban contexts. As Latour reminds us, issues of concern bring people together more than "any other set of values, opinions, attitudes or principles", but *things* expressing these issues give rise to "new occasions to passionately differ and dispute" [190]. This is what makes CivicDIY encounters *agonistic conflicts*.

The youth in this program came up with three different ways of using design to create things that can surface and address underlying difference. Usama responded to the uncomfortable tension around the provocative proposals and the older adults' reactions by constructing a virtual reality expandable to everyone's needs. Aditya and Adnan reacted to difference with "a different kind of politics" [43], while the others relaxed the reigns of reality and opted for speculative and spectacular proposals. What is common to all was that design was being used to *do politics*, or in other words, *the work of agonism*, but

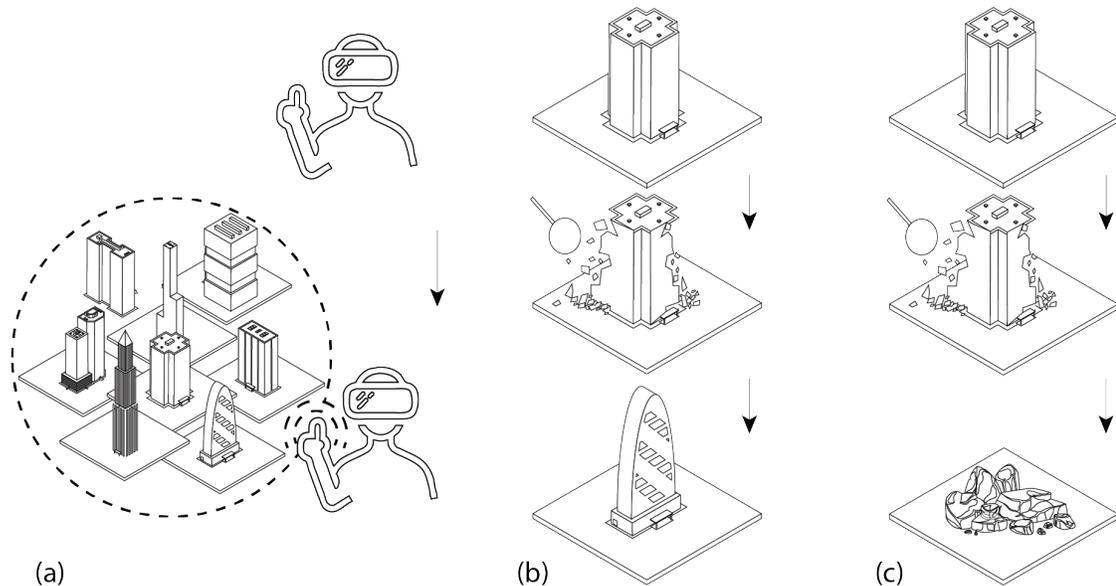


Figure 5.3: The (un)making strategies underlying the youth proposals: (a) making in virtual reality, (b) making with implicit unmaking, and (c) critical unmakings

in methodologically distinct ways.

5.8 Three Forms of (Un)Making

Some of the dynamics described in sections 5.6 and 5.7 can be attributed to the varying (un)making approaches the youth leveraged (Figure 5.3) and were brought to the fore as the friction and conflict revealed in the stories above. The youth proposals encompassed three (un)making forms - these forms are just strategies that we observed in the proposals and are *not taxonomies nor typologies*. The first strategy was making in the realm of virtual reality, which is common in HCI and the information and computing industries more generally. Through this strategy (exemplified by the VR zoo), something new can be added to the social environment without necessarily affecting other people's

experience of it. The next strategy was making with implicit unmaking. This is a common strategy in "traditional" design fields like architecture and product design. In these proposals, the youth all suggested making something new for the island, which implicitly requires that whatever existed there previously would be "unmade" to make room for it. These proposals did not however receive the same level of scrutiny and critical feedback as the proposal to destroy the Pinnacle. The last was critical unmaking, as embodied in the proposal to destroy the Pinnacle. The suggestion to explicitly unmake an object from a shared social environment garnered predictably conflictual responses and was the most provocative move that the youth employed in CivicDIY. In the next sections, I reflect on the tension between critical unmaking and other ways of seeing and doing in design, and how that tension can be productively leveraged pedagogically and methodologically.

5.8.1 Making in Virtual Reality

Usama conceived his virtual zoo idea after seeing animal origami models in our fabrication lab. He envisioned the zoo as an outdoor park activity (with or without a physical structure) in which rental VR headsets would offer a petting zoo for young kids and a scarier zoo for older kids. Usama was always conscious of the intergenerational and "consumer" aspects of his zoo, making sure there was something for all tastes and abilities. Usama's sensibility to consider and respond to diverse perspectives was demonstrated when he cleverly augmented the zoo on the spot during the presentation at the senior center, framing it as a virtual space where a multitude of cultural activities could happen. Capitalizing on the seemingly infinitely flexible affordances of virtual

reality, he was able to promise everyone in the audience whatever they desired: rooms with nostalgic memories for those who were from France, India, and Libya, arenas with age-appropriate interactions with animals, as well as rooms tailored to other interests and cultures.

This made everyone happy without causing friction around limited space or conflicting needs. I recall a question encountered often in CivicDIY discussions: *"Whose island is this?"* The response, provoked by making in virtual reality, was collective dreaming along the lines of the infamous "you get a car, and you get a car, everyone gets a car" from the Oprah Winfrey Show. The island could be everybody's, whatever they wanted it to be without disrupting or destroying what is important to others. In promising something that would work for everyone without taking up space or destroying existing property (akin to what virtual land trading platforms such as Earth 2 [1] promise), this form of making garnered a unique and unanimous positive reaction from the audience.

5.8.2 Making with Implicit Unmaking

The bulk of the youth designs proposed physical interventions such as a spa kingdom, underwater train, floating shopping mall, BMX park, and cultural center. These ideas provoked discussions with the older adults about the exact activities, parallel visions proposed for the island in the 1960s, potential incompatibilities with the island's quiet residential vibe, and feasibility prospects (given the river traffic for example). Unlike with the proposal to destroy the Pinnacle, the older adults did not contest what would have to be unmade to make room for these proposals. In fact, the Pinnacle

occupied the chosen site for both the BMX park and the spa kingdom.

I suggest that this is because the focus of the discussion was simply on what to be made (and how it would be used, maintained, secured etc.) rather than what would be implicitly unmade. Humans instinctively venerate creation, so any necessary unmaking often "goes by unquestioned, unexamined, unchallenged" [118]. Philosopher and design theorist Tony Fry notes that making and unmaking are entangled in a "dialectic of sustainment" [118]: anything that comes into being (visions, functions, pleasures, norms, and dreams) simultaneously destroys (habitats, resources, attachments, or other dreams). Everything is therefore situated within a dialectic of sustainment. But we are "mesmerized by the making and most often oblivious of the unmaking" [311], so we valorize one side of that dialectic. Such oblivion is handy: it keeps the focus of designers, institutions, and societies at large on "making" visions while the accompanying (invisibilized) unmaking dissolves existing objects, orders, or structures [311].

One of the youth, Khalid, deduced the two facets of this dialectic during the follow-up interview: *"the island is too small there's not much that you can really do. The only things that can be done we'd have to destroy something and then people don't want that."* Unmaking was all around us in these "making" youth proposals, just as it is in design, epistemology, politics, and economics. The reason destroying the Pinnacle was unusual is because the focus was on the unmaking facet – so solely and uncomfortably that the conversation could not be diverted to the post-life of the site or what would be made instead. In this second form of (un)making, as the focus remained on making (which is the inherent inclination of humans and design), the questions and reactions provoked among the youth

and older adults at the senior center were not as fractious.

5.8.3 Critical Unmaking

During the mapping activity, Aditya suggested, *"how about we destroy the Pinnacle?"* Adnan responded in a faint voice, *"yeah... I hate the people there."* From that point on, *"it stuck,"* as the pair notes. The initial reaction my advisor and I had to their proposal was: *"where is your design?"* To us, trained designers, their idea seemed lazy, frivolous, and devoid of novelty. We communicated our misgivings by asking for an "actual" design, for something "new". They obliged by designing a floating shopping mall. But throughout, they maintained allegiance to their proposal to destroy the Pinnacle, repeating it in every class, promoting it to others, and passionately advocating it at the senior center.

There was clearly both interpersonal strife, as well as socio-economic concerns, that underlined the division between Ferguson (who lived at the Pinnacle), and the rest of the class. When probed for the motivation behind the proposal, Aditya declared *"I think they should not live there... I don't really like it; I don't really like the people that live there. It's everything that I don't like."* Maha also supported the proposal, explaining their stance as *"... going against Ferguson. it was 100% against Ferguson. Whatever Ferguson was working with, we hated that... Like Ferguson's project sucks (but even though his was one of the best ones)"*. Layla agreed: *"Aditya had the thought of destroying Ferguson's place where he lives because he wanted the hatred of it. I thought it was a good idea because I was like the Pinnacle, it's big but really... I just feel they use a lot of space for a limited amount of people and that's the vibe they want, really rich, yeah, exclusive. I feel if we*

took that out, we replaced those people [with community-based functions]... sorry you just don't have a home now, we bought it out or something, I'd take that out, I'd take out the tennis court and all those stuff..."

Conflict around the Pinnacle destruction reached a climax at the senior center. The proposal evoked a different valence by openly threatening to take away something that some island residents called home or cherished for its historical significance. It was provocative and destabilizing in a way that the other proposals were not, enough so that some of the older adults came to us after the presentation concerned with what "all that talk" to "blow up" the Pinnacle was about. We reassured them it was mostly a joke and not something that anyone was actively pursuing. Such unmaking, which is when "material and/or imaginary elements ... are unintentionally or deliberately, temporarily or permanently, divested, damaged or even destroyed" [61], cultivated a fractious set of social interactions across several fronts. It set off struggle "between use and exchange values, between those with emotional attachments to place and those without such attachments" [368]. And while some elements of this proposal may have been driven by typical interpersonal adolescent conflict, it surfaced deeper concerns about the island and its challenges.

5.9 Discussion

Episodes 1 and 2 described how the youth design process and resulting artifacts acted as provocations that led to agonistic encounters among the youth and between the youth and older adults. The episodes' synthesis (section 5.8) then identified critical unmaking as one of the design strategies the youth leveraged,

contrasting its affordances to normative, and more amiable making strategies that do not require (or foreground) unmaking. In this section, I argue that the unmaking seen in CivicDIY is under-theorized as it stands in HCI, and that it needs to be recognized as an explicit design move when designing for agonism and provocation. This argument is structured as follows: first, I describe *what* we mean by critical unmaking in the context of CivicDIY (such that it does not fit with current unmaking imperatives in HCI). Next, I make a case for *why* we should recognize critical unmaking when designing for agonism specifically or provocation more generally. Lastly, I offer insights from CivicDIY on *how* critical unmaking can be fostered in (pedagogical) design contexts for provocation and agonism.

5.9.1 Making Unmaking Critical

Design arises when "a deliberate and directed approach is taken to the invention and making of products or services to shape the environment through the manipulation of materials and experiences" [82]. Design is then driven by invention and making, and commits variously to realizable solutions, growth, value generation, and user or consumer appeal. HCI has tended to privilege making, but designers and researchers in the field are starting to engage the act of unmaking [170, 245, 268, 283, 333, 382], proving its potential for creativity, learning, and production. Their unmaking works often by centering material ingenuity, the crafty nuances of dissection, and the creative opportunities disassembly affords in lab, factory, or design contexts. They posit unmaking as an "extension" to making [333] and a way to recover material for reuse [245]. They unmake (objects, materials, technologies), while

simultaneously making, by breathing "new life" into broken objects through creative reassembly [163, 170, 390] and developing novel material properties [245]. They compose vocabulary [333], garner generative interactions around physical de-fabrication [94], reduce environmental and societal harms [268, 203], and articulate techniques for moving on and letting go [308]. Further, they suggest comprehensive tools, methods and concepts to achieve desirable and predictable goals such as saving the planet and expanding design horizons. In other words, unmaking works in HCI entail both sides of the making-unmaking dialectic. And they render unmaking, which is "deemed to be de-motivating, bad news, politically unpopular, negative etc." [118], *palatable* by combining it with making, and imbuing it with novelty, innovation, and problem solving.

But what if we considered unmaking on its own ground, on its own terms, unobscured by any design/making imperatives? This is the realization that Adnan and Aditya forced: unmaking that is explicit, not folded within a making agenda, and without promising or negotiating anything new or shiny (since the pair wanted nothing in place of the Pinnacle). The design move of making unmaking *explicit* generated a proposal that tested what we know or view as design. From our perspective, the proposal was unusual yet banal, unrealizable (for the time being due to the Pinnacle's status and historical significance) but not speculative. It was confrontational, leaving no room to avoid or downplay conflict, and sobering, stirring up existing but under-discussed distribution and allocation disparities. The outcomes were unpredictable, raising sides and winning both passionate support and jarring opposition.

Initially, my advisor and I (and later on the colleagues we consulted) dismissed unmaking as a legitimate move, as it was done on its own terms,

and did not conform to the values or methods we had been trained in as designers. Over the course of CivicDIY, analyzing its data, and writing the paper, we have come to recognize critical unmaking as a design move. It had no "making" or "invention" aspects but it was "a deliberate and directed approach" [82] that shaped the course of discussion and conflict, and did the work of agonism. It cannot be folded within *existing* design (and unmaking) practices, which entail making, production, and novelty as argued above. As such, critical unmaking could be a new move that expands the repertoire of tools for contention and provocation in HCI, including in ways that may open up participation to outside groups that may be more limited, trapped or foreclosed by more conventional understandings of design.

5.9.2 Provoking Questions, Concerns, and Contestations

The simple observation that critical unmaking could be used in a design context led to a cascading set of assertions, conflicts, and social realizations. The youth pitched an irreversible and uncompromising proposal in the presence of Pinnacle residents and older community members. Unmaking helped the youth rhetorically *assert* their interpretation of urban priorities in the presence of an audience (the older adults) that was already critical of their loud behavior on the island, thus deriding any chance of "rational consensus" [237]. The provocative proposal left no room for each participant, as Goffman states, to "suppress his immediate heartfelt feelings, convey-ing a view of the situation which he feels the others will be able to find at least temporarily acceptable" [131]. The social veneer of consensus was thwarted and *conflict* ensued.

Throughout CivicDIY, we kept asking why Aditya and Adnan adopted that proposal. As we observed and probed it with the youth and older adults, the conversation took a different and heavier trajectory that led to several critical realizations. It went from day-to-day urban nuances to limited land resources and rent rising with every new condominium in the historically mixed-income island. It foregrounded the financial burden many felt (including youth) and the undesirable change of friends and classmates "*disappearing*" from the island school as their families move elsewhere. The questions that were raised surfaced long-running disparities and tensions - including who dictates the timescape of change on the island? What is more important, the historically recognized or the functionally relevant? And how does one react when their connection to home (island or Pinnacle) is threatened?

Looking back, critical unmaking offered a way for youth to step up "from below" [217] to confront adults who had far more say about the future of the island, and in ways unavailable through the more "makerly" strategies that our design activities had originally anticipated (and that other participants more readily conformed to). They used it as a tool to radically contest gentrification, a phenomenon they experienced, did not know its name, but enunciated through design. Seeing no possible resolution, but riven with hope and trepidation about a more equitable future [227], taking down the symbol of luxury and exclusivity on the island seemed like the only way forward. Compare the frictions, tensions, difficult discussions, and sobering realizations that emerged with unmaking, to how a more conventional approach like making in virtual reality was able to set out a "polyphony" of recreational chambers to make everyone happy, and to dissipate conflict before it could even manifest. From this perspective, unmaking was a more successful design for provocation

than making. It supported agonism but in ways that were: (1) less socially safe (since it left no room to evade conflict), and (2) less optimistic around whether a shared consensus or resolution could be reached. This made it uncomfortable for all involved. But what destroying the Pinnacle lost in amiability/conformity/palatability, it gained in provocation.

5.9.3 Fostering Unmaking and Agonism

Conflict, friction, and unanticipated politics inevitably arise in design and CS education contexts as many scholars have noted [15, 81, 227, 356, 357]. Agonism generally and unmaking more specifically could therefore be promising approaches for PD, YPAR, and pedagogical CS interventions that do not shy away from dilemmas nor seek to impose resolutions. Through CivicDIY, I have come to see that there are aspects that must be tended to in such contexts. First, unmaking and agonistic practices must be *protected*. Second, participants in agonistic encounters need to be *cared for*. Lastly, the affordances of unmaking and agonism need to be *considered* given the possible "complications" [15].

Agonism can emerge organically from participants' interactions as it is an inevitable aspect of human co-existence [237]. However, it is easy to suppress given our inclinations to optimize for consensus and avoid dissensus in the social "performance" we always put on [131]. CivicDIY was not established at the onset as an agonistic program - but it shifted into one where subversive action, risky design strategies, and oppositional encounters with outsiders helped youth invent counter discourses and test their ideas against the reigning reality. In section 5.6.2, I described wanting to bring the youth back on track and

achieve the goals we set for the program. Due to the observed conflict amongst the team, we paused to look beyond the immediately obvious situation and reflect on the motivations behind the youth behavior and values embodied in their proposals. Once we moved from "what" the youth were doing (or not doing) to understanding the "why", their provocations flourished, and agonism took its course. Friction emerged as a resource. In our case, a solution-driven empiricism threatened to sweep unmaking and agonism under the rug. Protecting them entailed *pausing, reflecting* and then *compromising* on the program's original goals. But it also involved a simple willingness to live with the discomfort of conflict – an effortful act to "stay with the trouble" [351] rather than planning, or negotiating, or designing it away.

The second aspect to tend to when fostering unmaking and agonism is care. Embracing the egalitarian social practices of agonism allowed fractures between the program team, among the youth, as well as between them and the older adults. But agonism designers and scholars do not speak about the care or recovery needed after such encounters. From my experience, recovery is essential, as conflict is hard emotional labor. Fractures surfaced the very real unamiable reactions due to the uncomfortable tension arising when threatening ideas are introduced in material form. We had to put in the delicate work of mediating oppositional groups (and our own discord), and carefully placate, translate, and emphasize the need for respect and seeing the world from the vantage point of others. Further, the youth had been classmates for a while at that point, and their internal conflicts did not seem to bother them too much. But they needed to vent about the senior center encounter afterwards, reflect on it, and *arrive at some form of closure that their ideas were not received with unanimous approval*. The semi-structured interviews and follow-up focus group served the

auxiliary purpose of reflecting on the conflict, accepting that consensus is not always possible, and moving on to other ways they could and would rather interact with older adults.

The last aspect to consider is that while unmaking and agonism can be powerful, they remain both underexamined and open-ended, in both HCI theory and the concrete situations in which they arise and are practiced. An effective assessment of these practices will require realistically considering how many "complications" (to borrow the term proposed by Arawjo et al. [15]) organizers and participants can handle. Agonism scholars advocate that embracing conflict is a way to prevent violence from erupting in the first place [237], but they do not provide guidance for when conflicts potentially turn into violence or aversion. As a rhetorical provocation (which is what we saw in CivicDIY, not the actual destruction of the Pinnacle), critical unmaking surfaced real conflicts that making and more productive/constructive/agreeable approaches to design did not. That is what the critical project in HCI sets out to do. *But what if it had gone further? What if the conflict got out of hand? How much of a shared strata of "ethico-political values" [237] and "gritted teeth tolerance" [67] can we assume participants have? What are the modes of voice and expression that go too far, that break, rather than extend and deepen, the nature of the design (or indeed democratic) encounters?* As we foster more fractious design moves, we cannot evade these questions, nor whether it is in our capacity as designers and educators to instill ethical, material, and emotional "guardrails" that might be needed to keep unmaking and agonistic processes (and their human participants) intact and on track. Further, we must acknowledge that the discomfort or potential violence arising from agonism and unmaking can afflict some participants (e.g. minorized or marginalized groups)

more than others. Lastly, these mechanisms might require acknowledging and establishing from the onset that some conflicts can never be resolved (in ways that some more polite and consensus-oriented projects may be less inclined to do). We were not as successful at this, given that the youth repeatedly expressed aversion that they never wanted to present their ideas again to older adults (but could go as volunteers). At the same time, we all (especially the youth) gained the very real knowledge that not all community needs are reconcilable, and not all design provocations entail predictable/desirable/realizable solutions. In hindsight, it was worth it - but considering potential complications (including in light of dynamics such as power, gender, and race) beforehand is never a bad idea.

5.10 Conclusion

This chapter showed how design gave youth, a demographic commonly excluded from agonistic design case studies, a channel to express their desired visions, and to contest undesirable alternatives. Design further allowed articulation of youth priorities into a material form that can be shared with and critiqued by others, surfacing difference and conflict in the community. And it created through conflict an active site of learning, reflection and sense-making. This chapter discussed how youth responded to the conflict and how this conflict shed light on larger intergenerational questions around housing, gentrification, and demographic change. The chapter contrasted the fractious response of older adults to some of the youth proposals, particularly the destruction of a luxury condominium where both one of the students and research team members lived, to the nearly unanimous support for the

"virtual reality zoo". Finally, this chapter used these examples to illustrate how normative approaches to design did not surface the underlying tensions and discussion that critical unmaking was able to do. By recognizing critical unmaking as a legitimate move in design, my hope is to expand the repertoire of design moves available to designers and participants as they seek to challenge authority and injustice through their critical work.

CHAPTER 6

THREE LINGERING PERSPECTIVES ON UNMAKING

The previous chapter has highlighted through the Pinnacle case study the existence of unmaking in the shadow of making and the potential of unmaking for agonism and provocation. My goal in this chapter is to bring back destroying the Pinnacle to extract some more insights - not in relation to making this time, but vis-à-vis the unmaking we see in the design literature. Specifically, I identify five typologies through which design, STS, and HCI scholars have approached unmaking. I then suggest three trajectories informed by CivicDIY (and my own positionality) that might be useful for design to consider when thinking about unmaking. I conclude the chapter with ideas for future work.¹

6.1 Introduction

Unmaking can refer to the disassembly of an object or structure as much as to the dissolution of values, ranks, habits, systems, beliefs, affiliations, and knowledge theories [120]. The Merriam Webster dictionary states that to unmake is to "cause to disappear (DESTROY); to deprive of rank or office (DEPOSE); to deprive of essential characteristics; to change the nature of." In the social sciences, unmaking is closely tied to Giuseppe Feola's conception of degrowth [99], and defined as the "multilevel processes to deliberately 'make space' for alternatives that are incompatible with capitalist socioecological

¹Section 6.2 of this chapter is based on a workshop CFP published at the ACM Conference on Human Factors in Computing (CHI), 2022. Full citation can be found here [301]. I have permission from my co-authors and the publisher to use the work in my dissertation. Copy of the publisher copyright permissions are in Appendix C.

configurations. They can vary from open confrontation[s] to 'exit[s]' from the dominant system" [354]. Matt Tierney defines unmaking for critical literary studies on technology as the "labor of picking apart social machines in order to understand them, and an insistence on smashing those antisocial machines that sustain unequal distributions of power" [345]. In design, philosopher Tony Fry defines unmaking as "the disassembly of an object or structure to recover material to reuse. It also means unmaking values, habits, beliefs, affiliations, and knowledge that obstruct acting against the unsustainable and acting for sustainment" [120]. Last but not least, in HCI, the CHI 2021 paper by Song and Paulos defines unmaking as "the destruction, decay, and deformation — of physical artifacts" which works over pre-defined fabrication paths along actions such as cracking, splitting, shedding, dissolving, shrinking, and sagging [333].

Unmaking, as evident by how the aforementioned definitions diverge in scope, materiality, and intended goals, is a broad and rich concept. I started the dissertation by offering definitions for design, difference, SLIDEs, ethnography and other terms since definitions help explain the positions and approaches taken. I have tried to do the same with unmaking in (numerous) previous drafts of this chapter so that we have a concise and shared understanding of the concept that is more general than Song and Paulo's definition but more specific than Fry's, and in line with the critical trajectory discussed in the previous chapter. My efforts were ultimately futile as the concept is too broad, under-theorized, and my interest in it is not tightly scoped yet that I could articulate it in a few, encompassing sentences. In lieu of a specific definition, I identify five typologies that generally capture the approaches to unmaking in design, HCI, and STS to then highlight three perspectives that could better inform our understanding of the existing typologies (or forage for new typologies).



Figure 6.1: Unmaking as (a) an inevitable occurrence [365], (b) a sustainment agent [283], (c) artful resistance [369], (d) elimination for good [185], and (e) material innovation [333]

The typologies and literature cited in the next section are not exhaustive - for example, they do not include work on design and post-humanism [364] - but for manageability, I only included works that explicitly use the term unmaking or relevant terms such as undesigning and unfabricating.

6.2 Unmaking Typologies in Design

A growing number of conversations in design have emerged recently around unmaking and related concepts such as elimination [268], un-crafting [245], and de-futuring [119]. Unmaking as a discrete design move has been leveraged in numerous creative ways in art [370], photography [219], education [135], game design [94], 3D physical scanning [243], fabrication [333], repair [172], gadget disassembly [283], and artful activism [293]. Seminal works in HCI,

STS, and design philosophy [24, 86, 117, 166, 334, 389, 334] can be said to epistemologically unmake how we approach design, design research, design contexts, and target users. Unmaking is further used by researchers and philosophers to describe myriad phenomena such as striving to dissolve "existing capitalist configurations" [99], destroying one's voice due to physical pain [309], and losing one's sense of home due to unfair housing policies [91] or unneighborly behaviors [61]. In this section, I survey design literature and synthesize some common themes to organize unmaking into a typology with five archetypes:

6.2.1 Unmaking as an Inevitable Occurrence

This body of work denotes that "things fall apart" [171] and "nothing lasts" [352] by drawing attention to the inevitable obsolescence, disuse, decay, and breakdown of designed things [53, 168, 170]. Scholars here offer critical insights that buildings for example weather [236], age [152], get sick [100], and ultimately die [53], just as markets collapse due to innovation [313] and infrastructures tumble down [169]. Analogously, phones break and batteries diminish in performance [161], machines give out in the workspace [259], large technological projects collapse [191], and software/hardware components are discontinued (e.g. Figure 6.1.a). This typology further highlights the ephemerality of materials, interactions, technologies and social networks [202, 291, 181] and the human temptation to destroy [284]. Despite this increased recognition, some scholars emphasize that decay, annihilation, and discontinuation largely remain a blind spot in design, and that we need to be more at peace with that "inevitable fate" [53]. This discourse further invites

designers to locate creativity and design opportunities that are rooted in broken, constrained, or ephemeral world thinking rather than normative imperatives such as growth, newness, and longevity [90, 170, 236, 352, 390].

6.2.2 Unmaking as a Sustainment Agent

This approach foregrounds the essential and active (but invisibilized) role of unmaking in design and the sustainment of life as it plays out in relation to making. Fry positions unmaking here as the taking down of existing ("unsustainable") things to give rise ("sustainment") to new others. He argues that unmaking is entangled in a "dialectic of sustainment" [118]: anything that comes into being (visions, functions, pleasures, norms, and dreams) simultaneously destroys (habitats, resources, attachments, or different dreams). Everything is therefore situated within this dialectic of sustainment - as "while you build the wall / you shall destroy the stones / while your eyes long for the window / you shall destroy the wall" [3]. Only making is valorized in that dialectic though while unmaking remains largely "unseen" [118, 311, 386] and goes by "unquestioned, unexamined, unchallenged" [117]. Such oblivion is handy: it keeps the focus on making paradigms while the accompanying unmaking dissolves the work of others, produces waste material, disposes hazardous waste, creates "left-over" spaces [311], and raises conflict around diverging priorities [299, 260]. This discourse goes beyond theoretical elucidations around unmaking in relation to making, by exploring the centrality of processes such as repair and disassembly to ecological and sociotechnical innovation in certain contexts [171, 172, 210, 258, 283] – e.g. Figure 6.1.b.

6.2.3 Unmaking as Artful Resistance

Numerous designers, artists and art movements have resorted to unmaking to contest or raise awareness. For example, the series of photographs (Figure 6.1.c) depicting artist Ai Weiwei nonchalantly dropping a 2,000 year old Han dynasty urn to smash on the floor daringly question what constitutes the omnipresent historical, social and cultural values of a thing [369]. The Auto-Destructive Art movement [222], founded in 1959 by Gustav Metzger, brings destruction into public consciousness as a "kind of mass-therapy" around war calamities. More recently, the work of artists and activists behind Beautiful Trouble [293] designates sites of unmaking as powerful points of intervention. Designers have further explored the material affordances of computing to propose unmaking certain hegemonic values or complacencies such as surveillance [82], selfish consumption [149], information over-sharing [183], and social norms [85] in ways that rely on aesthetics and novelty to draw the user or spectator in.

6.2.4 Unmaking as Elimination for Good

Unmaking through "elimination design" [119] is driven by concerns around the environmental and societal harms that occur because the world is inhibited by too many things. While the second typology, Unmaking as a Sustainment Agent, pairs unmaking in relation to making, elimination for good is purely content with unmaking. Instead of market operatives dictating what should be available, this discourse calls for a critical examination to determine if products, objects, and technologies are worth what they harm or destroy, and if so, when, where, how, and for who they should be available [120]. Tonkinwise proposes

four strategies to "rid the world of stuff": vilifying with persuasive design and prefigurative criticism (e.g. situating prototypes within undesirable rather than positive branding), replacing products with others that lead to a net reduction in consumption, restructuring the built environment, and disowning products [347]. Building on elimination design, Pierce proposes undesigning as "the intentional and explicit negation of technology" [268]. Undesigning entails a range of negation strategies such as inhibition, replacement, and erasure. Inhibition restricts technology use in certain contexts or for certain tasks as in airplane mode and bandwidth caps. Replacement substitutes a technology with another – for example a product (e.g. a car) with a service (carpooling), or ambient heating with blankets and heavy clothes. Lastly, erasure removes technology from a context temporarily or permanently such as Wi-Fi from coffee shops to encourage face to face interactions [268] – Figure 6.1.d. Unmaking in this discourse has also been explored for emotional letting go [209, 308] and dealing with the "aftermath" of design such as plastic and polluted soil [203]. Lastly, researchers have also proposed the unmaking of conventional design approaches that focus on a simplistic problem-plus-solution framing, offering "anti-solutionist" approaches instead that are arguably more fitting for grappling with nuanced issues [40, 77, 78].

6.2.5 Unmaking as Material Innovation

A slew of "un" practices such as unmaking [333], uncrafting [245], and unfabricating [382] heralds a discourse in design focused on the materiality of unmaking. Song and Paulos propose unmaking as "the destruction, decay, and deformation — of physical artifacts" [333]. Their formulation posits

unmaking as a valuable extension to making, achieved by digitally designing and fabricating objects that unmake in pre-defined ways post-making. Such unmaking builds on 4d printing practices that leverage advances in material science to shift shape through heat or other agents using controlled paths (Figure 6.1.e). Their articulation offers a vocabulary for unmaking including cracking (breaking without full separation), splitting (fully separating into distinct pieces), shedding (of the surface layers, one by one), shrinking (as a byproduct of shedding), and collapsing. Wu and Devendorf [382] similarly develop a pipeline of hardware, material modifications, and digital design tools but for unfabricating smart textiles to support sustainable ways to mend, disassemble, and reuse. Lastly, Murer et al. propose uncrafting as "the thoughtful, reflective process of disassembling ... something which could be developed into a practice that – not unlike other studio crafts – requires particular skills, involves specific ways of reflection, and develops and according set of terms and framings" [245]. Uncrafting is geared towards material exposition, drawing design inspiration from constituent components, inquiring into the underlying logic, and exploring form-function relations.

6.2.6 Synthesis

In this section, I have identified five typologies of unmaking in design. The inevitable occurrence typology acknowledges breakdown, obsolescence, and disuse, and invites designing with or for that. The sustainment typology highlights what it takes to make something new by foregrounding the important role of unmaking in design. The artful resistance typology leverages the aesthetics of unmaking to jolt routine consciousness out of complacency.

The elimination typology offers critical and pragmatic, product-centered approaches for removing or reducing. And the material innovation typology centers generative dissections, pre-planned unmaking, and the learning opportunities disassembly affords. These typologies can have overlapping applications. For example, many art movements (e.g. Auto-Destructive Art) have resulted in pieces that are a hybrid of unmaking as resistance and as material innovation. Similarly, enabling unmaking in digital fabrication is envisioned to help develop more sustainable materials and considerations. Taken collectively, these typologies suggest a rich and generative view of unmaking as a more overarching class of activity.

Back in chapter 5, the discussion highlighted how unmaking is an integral part of design and making even if it is largely invisibilized. The discussion further suggested that unmaking is a promising tool for doing the work of provocation and agonism. Having now delved deeper into the design scholarship on unmaking, I find that there are three more unmaking-related insights from CivicDIY that we do not see in the existing literature but are worth mentioning. The first relates to the boundary we draw around unmaking processes and actors. The second emanates from the tensions inherent to unmaking. The last relates to the loss, suffering, and pain that get erased under the "progress in inevitable" ways through which we tell stories of the world.

6.3 Re-judging the Boundary

The typologies of unmaking identified in section 6.2 illustrate how artists [369, 170], photographers [219], educators [135, 136], product designers [82],

repair workers [283], philosophers [171, 118], and makers [333, 243] leverage deconstructive modes of learning, analysis, and material engagement to produce stunning works and insightful theories. These works contribute a fresh understanding of phenomena such as residual waste, cultural value construction, and technological progression. They unmake (objects, materials, technologies), while simultaneously making, by breathing "new life" into broken objects through creative reassembly [163, 170, 390] and developing novel material properties [382, 333, 283, 244]. They build unmaking vocabulary to further design innovation [333], support generative interactions around defabrication [94], aspire for reducing environmental and societal harms [268], and put forth techniques for moving on and letting go [308].

Despite their breadth, the existing typologies and applications of unmaking in design share two commonalities:

1. They imbue unmaking with making through a focus on novelty, innovation, recreation/repair, creative problem solving, and progress.
2. They study or enact unmaking on objects that are residual/discarded [170, 203, 283], available in the lab [243], made specifically for unmaking [333, 352], assumed to be amiable for unmaking [347], or are in the realm of theory [279].

In CivicDIY, we see the youth engaging in a process of examining, advocating against, and then wanting to unmake a designed thing which they believed symbolized increasing harm and disparity. We further hear the responses of the sides impacted: Ferguson's viscerally-charged disapproval: *"It's depressing that someone spends so much of their daily time thinking about*

how their friend's apartment building sucks", my advisor's bewilderment, and the older adults' authoritative "*Cornell Tech has lots of land... Don't fool with my lunatic asylum!*". While we did not investigate the reactions further at the time, we can speculate about the (unfavorable) opinions and accounts of such unmaking coming from those who called the Pinnacle home. Ultimately, this encounter highlights aspects of unmaking that go beyond the existing typologies. Specifically that:

1. Unmaking does not just impact things that are discarded, in the realm of theory, available in the lab, or made for unmaking. It works on existing objects, policies, systems, thoughts, and norms that might be used or venerated by those who are not the unmakers. Unmaking therefore tinkers with (or disrupts) things set within (stable) networks.
2. There could be other (often in-power) stakeholders who do not consent to unmaking.
3. What is unmade as "good" for one side can be "bad" or undesirable for other sides who hold different priorities or attachments.
4. While this did not happen in CivicDIY, unmakers go ahead with the elimination in the real world (even if there are objections) and might face the consequences of their unmaking (e.g. prosecution)

In systems thinking, the process of determining what facts and norms are to be considered relevant to a given context, and what others are to be left out or labeled less important is termed "boundary judgment" [353]. This judgment acknowledges that our claims and abstractions are inevitably "partial", in the sense that they are selective of which facts and norms are considered relevant,

and in ways that could benefit some parties more than others. The points informed by CivicDIY and highlighted above tell an interesting observation about the literature: design scholars have *drawn a fairly tight boundary* around unmaking that it generally only includes those who buy into it and see it as good. This boundary leaves out potential objections, dangers, legal battles, and ethical paradoxes that could accompany unmaking. In a way, *it leaves difference out*.

CivicDIY teaches us then that the boundary around unmaking should be realistic and expansive to include different sides and complications (as fractious or paradoxical as they might be) and to see "things as they really are" [17]. At the same time, while inspiring us to engage deeply with the concept, CivicDIY has through its expansive boundary de-romanticized unmaking itself by raising the moral dilemma associated with and the views, lives, and attachments of those impacted by unmaking. This made visible the humans and objects, collectively involved in the unmaking proposal. If we examine popular slogans in our field such as "Move Fast and Break Things", "Disruptive Technology", and "Creative Destruction" in light of destroying the Pinnacle, should we then not question their zeal (and appeal) by asking: "what about the people and places broken in the process?" [32]. We should, just as we have to grapple with the tensions that come when the boundary around unmaking is rejudged.

6.3.1 Grappling with Tensions

Why is unmaking undertheorized in design? This is a question I often encountered from colleagues and reviewers. I believe that part of the answer to this question

lies in the tensions associated with unmaking - an inevitable side effect we would have to grapple with especially when the boundary is re-judged to include the more tension ridden aspects of unmaking.

Articulated within the context of inequality norms, poet Audre Lorde cautions that unmaking is prone to accusations. She writes: "Do not let your head deny / your hands / any memory of what passes through them / not your eyes / nor your heart everything can be used / except what is wasteful / (you will need to remember this when you are accused of destruction)" [206]. In *Dropping a Han Dynasty Urn*, three photographs depict artist Ai Weiwei letting go of the 2,000-year-old object to smash on the floor. His work heralds a breakthrough for destruction-based art and legitimately questions what constitutes the values of an object, but the famous artist had to carefully justify the projected material loss [369]. Similarly, machine breaking framed the Luddites as delinquent technophobes worthy of the death penalty [242]. Even in co-writing papers, the most pronounced conflicts I have experienced ensued when a co-author deleted parts written by another.

From my readings in architecture, psychology, archaeology, English literature, and HC, I have identified a few tensions associated with unmaking that merits attention and future consideration. Most obviously, it often acts upon what is owned, used, or venerated by someone else, sometimes against their wish. It is therefore emotionally charged and leads to interactions that are uncomfortable and potentially unpredictable. Further, when objects, habitats, and laws are unmade, sides emerge, raising the dilemma if the struggle is really between heroes and villains, good guys and bad guys, or among an ensemble of "subject positions" each with legitimate claims [237]. There are further, more

subtle sources of tension.

Unmaking acknowledges the vulnerability and impermanence of our societies, thus threatening the stability and permanence humanity desires and projects onto itself and what it makes [53]. Perceived as distasteful ruination, unmaking lacks the romanticism of natural withering [256, 372]. At the same time, taking down is often laborious, messy, and ungeneralizable. It leaves no "patentable" outcomes or much to show. It "cannot be based on a nice, neat checklist" [119] since, as Jackson et al. argue, "all functioning systems are alike; all broken systems are broken in their own way" [171]. Analogously, we can say that while it is standard to package and sell new objects and designs, the removal of them demands interrogation (and resolution) of multiple overlapping contextual factors. (Critical) unmaking in fact can be a "system" in its own right, encompassing what is being dismantled, the nuances of the deconstructive act, the motivations, power agendas, struggles, resistances, and/or creative processes. It extends to the residue (tangible, intangible), visceral reactions, and practical consequences of the act. It is therefore not always possible to draw a neat "big picture" of what is unmade and what is interconnected and implicated.

Lastly, unmaking is often "deemed to be de-motivating, bad news, politically unpopular, negative etc." [117]. It challenges our human nature, for which the newness of things is "the source of our greatest energies" [205], or what political theorist Hannah Arendt terms "natality". Our excitement and fascination with the new is like "an ever-present reminder that men, though they must die, are not born in order to die but in order to begin" [18]. Design, as instantiated in making, is then natalist because it is preoccupied with

innovation, instantiations, perpetuity, and growth – not decay, breakdown, or destruction. Its tools and vocabulary galvanize fantasies, render utopian visions, and continuously give shape to the future so our worldly states are reborn anew. A quick Google image search reveals that even dystopian visions favor built edifices and awe-inducing objects over ruins or dissolved stratum. Some critics go as far as postulate that the timeless and universal style of modernism was an attempt to escape obsolescence and mortality [3, 372] - to sustain for longer that initial state of "birth", of being "something new" [350]. Perhaps this is the trickiest tension to grapple with: that unmaking (at least on the surface) is antagonistic to newness, excitement, ownership, and the capacity to begin.

Collectively, the anti-natalist perception of unmaking, its involved non-generalizable nature, and the destabilization potentially associated with it could explain. These tensions will come under our purview when we start to see, think with, or leverage unmaking more frequently especially on things outside the lab or studio. But perhaps the most involved tension we should grapple with is that unmaking might require us to rethink what progress means in the first place as described next.

6.4 Seeing Loss, Rethinking Progress

Roosevelt Island, previously called Blackwell's Island and then Welfare Island, obtained its current name in the 1970s in honor of Franklin D. Roosevelt. I am currently reading the former president's biography to better comprehend the history of the place where I did my PhD and fieldwork. His biographies often

start by narrating the state of the US and its economic hardships at the time of his election in 1933. Historian Robert Dallek notes that despite the difficult conditions of the time, they "had not been bad enough for long enough" to lead to a revolution, and that the majority of Americans still held to the American dream: "the idea that national progress was inevitable and that they and their children would enjoy greater creature comforts" [74].

In studying the great suburbs of the 1960s, I had seen the manifestation of the American Dream: large automobiles, mobility freedom, and expansive home with well-manicured yards and barbeque equipment. I was not aware however that the dream is ideologically rooted in *inevitable progress*, and that Americans have held to it despite compounding hardships. This dream makes sense through the lens of modernity, as decline (e.g. what the US was experiencing in the 1930s) was no longer seen as the pure opposite of progress; "rather progress has become a world historical category whose tendency is to interpret all regressions as temporary and finally even as the stimulus for new progress" as philosopher Amy Allen clarifies [13].

But is progress inevitable? At what time scale does that inevitable-ness finally happen? And for which social actors? I have not discussed progress in the dissertation, but it is a concept that implicitly envelopes the readings and research I did on unmaking. Progress is a "moral-political imperative, a normative goal that we are striving to achieve, a goal that can be captured under the idea of the good or at least of the more just society" [13]. Progress is crucial, as what sparked my interest in difference is the presence of different views of the good life in a community and how to make progress through design towards mediating those views. What I see as an oversight in the



Figure 6.2: Left: Typical explosion in Baghdad, Iraq [6]. Right: The demolished Nahr Al Bared Camp [109]

Western view of progress is that we are conditioned to see it as a straight line with an ultimately positive slope (potentially intercepted by dips and intermittent recessions). Given the presence of ethnic, socioeconomic, and religious differences in society, I believe that a crucial extension to working towards difference (in deliberation, care, or agonism) is to rethink progress in a way that acknowledges its differentiated facets and impacts. Unmaking can help with that as I suggest next.

6.4.1 The War View of Unmaking

Elimination for good [119], infrastructure repair [172], decolonization [192], and the right to disconnect [156] are some of the salvation and progress we seek through unmaking in design and technology. But there are other ways to see unmaking, including as a source of pain, loss, and ruptures - *a decay after which inevitable progress does not seem to loom in the horizon*. For this, I will bring yet another a piece of my personal journey.

I was born in Iraq a few days before a war broke out with a neighboring country. I was too young to know at the time what was happening. But over the years, my parents and relatives have often shared with me what it was like to care for a new born during a time of extreme economic disintegration, social instability, and physical destruction and how that distress impacted everyone including me. Their memories of war, vivid and emotionally charged, have often made me feel that I have consciously witnessed it. When the war ended, physical unmaking stopped, but only for harsh sanctions to start and the country went into economic decline. The disintegration and unmaking of prosperous Iraq, ecological habitats, and economic stability were then my first encounters with life.

That war was followed by another one that lasted for much longer (in fact we are not sure if it has ended at all). I only experienced a whiff of this more recent war given that my family and I had permanently left Iraq. In visiting my homeland every few years as an adolescent and then adult, I have had a more direct experience with war and its unmaking - Figure 6.2-a. An example is when sirens went off during an active raid. If we were inside, we had to take refuge in the safest part of the house - typically a lower floor with no glass. We would hear shells, rockets, and things falling down as we waited, and anticipate what might get unmade by the time the raid was over. I can best describe these encounters as *anticipative unmaking* - what will be unmade? - and *experiential unmaking* - actually hearing and seeing things falling apart. In either modes, one inevitably wonders how the resource strapped country would recuperate and move forward from this.

Fast forwarding to 2014, I came across the image in Figure 6.2-b while

doing research for my Master of Architecture (M.Arch) thesis on building long-term refugee camps. The image depicts a Palestinian refugee camp in Lebanon, which after more than 50 years of informal growth, had turned into an impermeable concrete jungle and was deemed unsafe from the government perspective. Despite the objections of residents, the camp had to be completely unmade in 2007 in order to make a new one in its place that met stringent architecture, urban planning, and security standards. The new construction led to even tighter living spaces since wider streets had to be built so residents could not recuperate their full homes or spaces. As of 2018, half of the residents have not been rehoused in the first place and remain internally displaced [182]. What progress have these residents then experienced over the long fifteen years since their homes were first eradicated?

The camp image stayed with me for a long time as I tried to grasp the full extent of destruction it underwent and the residents' loss and despair. Sensitized by my experience with war, I wondered why we never saw images like this camp in my many years of professional design training. How could we study fortifying buildings (and making stable software) without unmaking - their *inevitable* reality? Who tends to the unmaking then? As a political statement, I decided to spread the camp image over two letter-sized pages right in the center of the M.Arch dissertation book. Today, I include the same image in my doctoral dissertation to make that same statement: *progress might be inevitable, but unmaking is even more inevitable and not necessarily in a progressive way.*

With these experiences and exposure, it is not surprising that while my view of unmaking is hopeful about its potential, *it is equally daunted by melancholy,*

loss, suffering, and the pain it could inflict. So what matters here for design from this war view of unmaking? For some nations or communities we as design researchers work with - e.g. those experiencing war, natural disasters or terrorist attacks or have fled them, unmaking is a fact of life, taking a grand, front, and center place within the experience of material worlds. Sometimes it is followed by progress or construction, other times the loss lingers with no prospects of overarching progress. It could be decades (or centuries) after certain unmaking events that the progress line is restored to a positive slope. While we should maintain the hope and aspiration to design for a good life, we must be sensitized to those other, differing ways of being in the world, where progress is not experienced as positively linear nor as inevitable, particularly as inflicted by different forms of unmaking.

Studies on unmaking should therefore focus not only on its generative sides: repair, ecological rejuvenation, and restored well-being. If we expand the case studies and theorizing of unmaking, then what we view as progress, hope, and continuity (and in return discontinuity, ruptures, and de-progress) might completely change. Is that change desirable or fruitful? I do not yet know, as that is in the realm of future work. But for one, it would do more justice to the different experiences that exist in communities whether we approach them through deliberations, care, or agonism.

6.5 Future Work: Empirical Accounts of Unmaking

I led in April 2022 the Unmaking@CHI: Concretizing the Material and Epistemological Practices of Unmaking in HCI workshop at the ACM CHI

Conference on Human Factors in Computing (CHI'22) [301]. Each of the fifteen workshop participants shared a different palette of unmaking, such as designing with non-human worlds [364], doing art in ways that celebrate decay and deformation (including by non-human factors and bodies), developing HCI pedagogies focused on more than making, thinking about the "right to unmake", and expanding the possible realm of material properties [333] among others. These palettes collectively point *to a systemic change where we cannot keep doing things like we used to before*. For one, the world is full with things - on land, in the ocean, and suspended in the atmosphere, that like to persist to the point that landfills are filling up fast. Volatile political events are further creating waves of disruptions and ruptures that bring about ambiguity, uncertainty, and instability. Under these ecological and political circumstances, temporality becomes serious since we do not know how much human control we possess before forces of ecological suffering or turmoils take over.

We as designers have to therefore deal with what we do not want to account for (e.g. discarded stuff). We will increasingly operate in a world that forcefully pushes back, ecologically, socially, and economically. A different and more humble positioning in processes of gathering and assemblage is then needed to intercept heroic or agental notions of design. Could unmaking be a way to explore, or further elucidate, what has not been sufficiently accounted for in design? And does unmaking offer alternative views of agency, control, and temporality that work with worlds of shifting and different possibilities and lives? Answers to these (uneasy) questions could lie in locating empirical accounts of unmaking for what has not been accounted for. Based on a recent discussion with some of the Unmaking@CHI workshop co-organizers and the workshop data itself, we need as future work exploratory methods and

empirical accounts on unmaking in the following areas:

- Ecological matters including climate change concerns, designing with non-human worlds, and accounting for biological processes and materials that question interactions and the bounds of design.
- Temporality, which includes examining errors, failures and breakages as points of origin, the order of unmaking in the design process and aftermath, and liability and responsibility over time. Unmaking could further invite other temporalities and decompositions in lieu of the stunted view of temporality associated with design, which is rooted in newness, novelty, and creation.
- Modes of teaching and learning unmaking.
- Participatory and community engagement including collective unmaking structures, political and ideological framings, and unmaking for emancipation or to creating conditions under which emancipation is possible
- Ontological and material explorations such as unravelling, material innovation, and unknown/nondeterministic processes.
- Connections to making, design, and repair including how unmaking could offer a generative way of rethinking dominant languages and approaches in design, grappling with the contradictions of making, and seeing beyond the dominant design narrative.
- Values and ethics including the ideological framing we could share for unmaking, values and methods as collective structures, and unmaking ourselves - as researchers and designers. *Difference* could be a major agenda here, particularly the provocation that unmaking holds to

designing with the political, advancing certain priorities, and activating or demoting "agonistic respect" [67].

6.6 Future Work: Design Methodologies for Unmaking

Design does not yet have formal methods or processes of (collaborative) unmaking. We need to consider how (critical) unmaking design contexts should differ from making, and how unmaking projects can be translated, prototyped, and evaluated. We might also require different forms of participatory and pedagogical organizations around unmaking, and we definitely need to co-develop different, more expansive views of progress in such contexts (and its possibility in the first place under certain conditions).

Further, in the realm of material things, unmaking (whether rhetorical or enacted) is likely to operate on things used, owned, or venerated by subjects who may not be the unmakers. As I described in section 6.3, the current design literature primarily studies or enacts unmaking on objects that are residual or discarded [170, 203, 283], available in the lab [243], made specifically for unmaking [333, 352], assumed to be amiable for unmaking [347], or are in the realm of theory [279]. Rejudging the boundary of unmaking could expand the repertoire and scope of design moves while increasing their material consequences, and hence resistance and unpredictableness. For example, "complications" [15] arise if we want to unmake from a shared environment as we saw in CivicDIY. What if these complications escalate into antagonism and even violence? To paraphrase a question asked in the previous chapter: *What modes of unmaking go too far, that break, rather than extend and deepen, the*

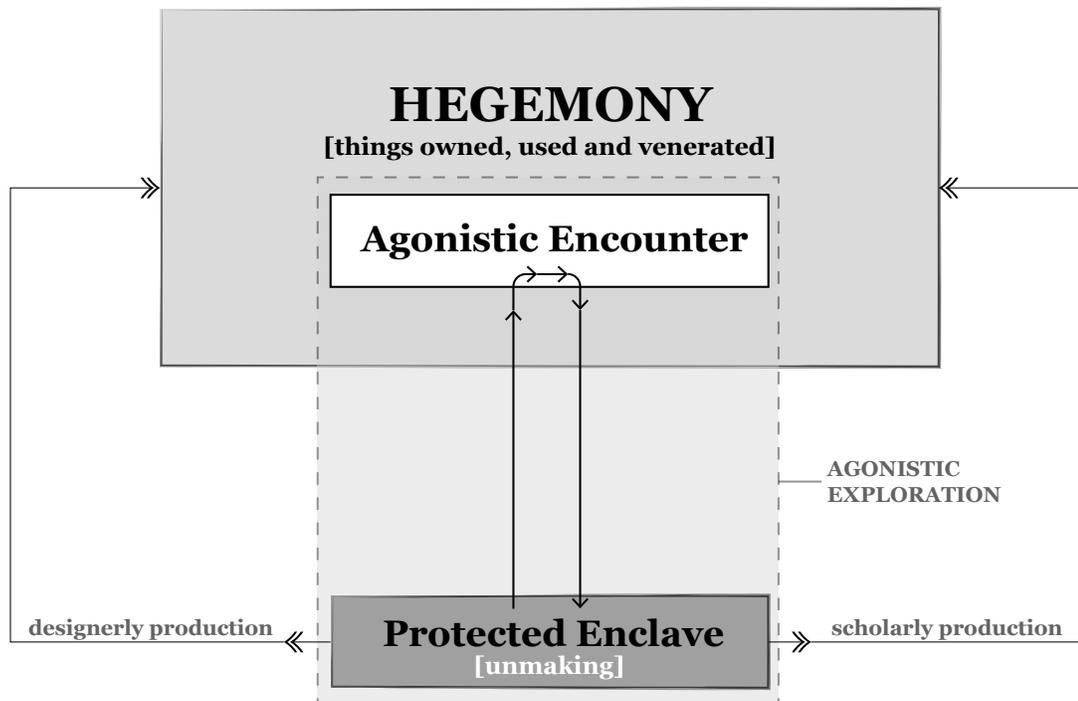


Figure 6.3: Exploration Framework around Unmaking

nature of the design (or indeed democratic) encounters? As we foster unmaking as a design move, we cannot evade this question, nor whether it is in our capacity as designers and educators to instill ethical, material, and emotional "guardrails" that might be needed to keep unmaking (and its participants) intact and on track. The resistance, unanticipated aspects, and possible implications for design of unmaking therefore all require future explorations.

A concrete participatory avenue for future work here is the agonistic exploration framework I propose in Figure 6.3 based on CivicDIY, but with some refinements. The framework operates across two spaces. The first is a protected enclave - a term that Mansbridge [213] uses to refer to places that groups not winning in a democratic process retreat to in order to recover, rework their strategies, and get ready to fight back. The enclave notion is already embedded in how design and education have been used to give rise to publics and counter

publics, and infrastructure sociotechnical networks [178, 194]. This space could therefore be a PD, SDBE, YPAR or SLIDE context.

The second space is hegemony, which in a Gramscian sense refers to existing power vested in civil society and state institutions [134]. In this framework, it therefore means the communities immediately outside the enclave, which is where things that need unmaking are located but likely owned, used, or venerated by others. The role of the protected enclave is to engage designers and participants in activities around unmaking (and making) but in the presence of psychological, sociological, and ethical guardrails to ensure that unmaking (including that which is controversial, confrontative and/or tinkers with existing, venerated things) remains agonistic and not slip into antagonism or violence. From there, participants can engage their unmaking with yet more agonistic encounters, this time in the place of hegemony (e.g. the senior center in CivicDIY), and then come back to the enclave to reflect and recover. In either space, conflict and controversy can erupt, but we as designers and organizers would have had the training and tools to handle them, and scaffolded the program with the necessary components. This includes a code of ethics, a protocol for facing difference, and a shared understanding that the world is filled with things, so emancipation and justice from each situated positivity might require one to *undermine* [24], *unlearn* [13], *dissolve* [337], or *undo* [7] certain structures and epistemologies currently in place so that new structures and knowledge arise from the “ashes” of the old.

Lastly, here is a question that organizers and participants should often revisit in this framework: *what is a middle ground where hegemony is “tinkered” with through imaginaries of unmaking but in ways that protect the participants while having*

some form of real impact? I see designerly and scholarly production as one possible way, where the outcomes produced in the protective enclave can be fed back into hegemony through the production of "professional" artifacts that could communicate, celebrate, and promote unmaking. In that vein, "lyrical" papers as proposed by sociologist Andrew Abbott [2] written to be empirically rigorous yet touch the hearts and minds are one way. Another are participant-based designer-communicated artefacts (material/rhetoric) as I have done with destroying the Pinnacle rendering in Figure 5.2.

6.7 Conclusion

Tony Fry notes that designers (1) often disregard that "creating the sustaining new is not possible without the clearing made by destruction", (2) assume that unmaking is "self-evidently straightforward", and (3) fail to "fully confront" the melancholic prospects of unmaking [118]. I hope that the case study detailed in the previous chapter, the tensions suggested, and future work scoped can help us recognize unmaking more explicitly, see its involved nature, and understand why we have a hard time confronting it (even though we need to). With that, we can be attuned to both the hopeful prospects of unmaking such as in the context of sustainability and remediation [382, 258, 203] as much as to the possible tensions, loss, and no happily-ever-afters. These two facets are inevitable when unmaking is used to "settle" different claims for the good life.

CHAPTER 7

CONCLUSIONS AND FUTURE WORK

Public deliberations, pluralistic care, and agonism are three stances to approaching difference this dissertation explores through design-based field work conducted in civic contexts within a major American city. The first stance, which I identify as public deliberations, draws on theories of deliberative democracy [30, 376, 144] which set deliberations as a central process for authentic decision-making. It calls for approaching difference by identifying and enjoying moments of commonalities across a diverse society as it deliberates the good of the collectivity. While the final goal of the deliberations is majority-based census, the process of getting there is envisioned to surface conversations about the differences that exist in that society and build rapport and mutual understandings around them. The second stance, which I describe as pluralistic care, draws on political philosophy [67], urban sociology [320], and the work of care scholars [234, 274, 387]. It proposes approaching difference by bringing pieces of pluralism into the public realm, along with curiosity, dialogical skills, and making time for care - a term that is vital for social existence but is hard to capture in a definition [234, 275]. Lastly, agonism draws on the work of political scientist Chantal Mouffe and others [237, 160] who make a case for creating permanent spaces that surface conflict, visibilize disenfranchised needs and contest hegemonic practises.

The field work detailed in chapters 3 through 5 offers an instantiation for each of the stances through design and uncovers some of their affordances and finitudes. Specifically, Meaning of Home (chapter 3) informs us that public deliberations are promising when the goal is to surface a joint narrative

or identity. But this approach does not necessarily create rapport towards difference and can cultivate a misleading facade of unity which leaves out minoritized narratives - especially since many design tools are already optimized to defy difference. *Remaking the City* (chapter 4) informs us that care can bring us closer to a relational state of equilibrium, but that it entails time-consuming work and compromises including on desired deliverables. Lastly, *CivicDIY* (chapter 5) informs us about the potential of agonism and critical unmaking to reveal invisibilized narratives and raise discussions that other approaches to difference may not raise. This *does* come with complications that require more research from an interdisciplinary lens (such as behavioural science and conflict studies) for how agonism (and unmaking) should be done in design contexts around difference.

Put together, this doctoral research started with the common, consensus-seeking approach and ended on a riskier, conflict embracing one. Choosing an approach over the other ultimately depends on the goal of the design context, the desired affordances, and the social justice considerations in place. A combination of the three approaches and others - disengaging from difference all together for example by withdrawing from the other [320] - are necessary for any society to function and stride towards its future. Further, each approach raises questions about how to do design itself. If we leverage design towards constructive ends (e.g. mediating difference), what does "constructive" actually mean within the purview of design? Why are many common design tools focused on foregrounding commonalities? How do we structure processes of inquiry into designing for peculiarities, nuance, and rawness instead of "cooked" analyses and curation? If we take care, conflict mediation, and unmaking, what counts as work and what does not count as work in design?

Last and not least, how do we recast design so that unmaking (a fundamental aspect of design) is recognized as design?

At the junction following chapter 5, there were several paths I could have taken to gather the dissertation threads and wrap up. For example, I could have engaged with how the three approaches to the political might evolve into an urban literacy mandate around difference that is disseminated at a larger scale and woven into various programs and institutional frameworks. That in fact is a goal I hope to achieve in my career on the long run. Describing ways to make "care-time" through design when deceleration is not an option could be a productive follow up to this work. Of equal importance is dwelling on some lingering aspects from CivicDIY such as how to practice agonism (and unmaking) safely and with care through design, and how to make room for unmaking in design in the first place. Lastly, there are many interesting questions to pursue around the techno-solutionism VR promises in the context of future urban co-planning with communities, how difference might manifest there, and with what propensity. I ultimately chose to focus in chapter 6 on unmaking and the three trajectories we can pursue in light of what CivicDIY teaches us. In the few remaining pages, I reflect on two theoretical and methodological components raised in the dissertation, including ways that they could be extended or expanded in the future, or made more relevant to practical concerns in the design field.

7.1 Situatedness and Relatedness

This point is likely common knowledge to anthropologists and sociologists, but it was new to me and might be for many architects and designers. My doctoral research in its various constellations has involved multiple activities, primarily observing, listening to, and mingling with many participants/island residents. I mentioned in the introduction that the participants were also my neighbors, and the neighbourliness mattered a lot. This multi-year situatedness in the field site for a shy introvert like me created relatedness that proved far more fruitful than just producing a dissertation.

When I moved to Cornell Tech back in 2017, I did not feel related to anyone and nothing seemed relevant to me. The breakthrough came once I started doing the Remaking research interviews in January 2018 and interacting regularly with the middle school in the Spring of 2018. I came to see a variety of "other" people who exist out there, including inspiring women in leadership positions, kind souls who stuffed my purse with food at island events because they thought I was too skinny, youth who practised religion, graduate students who were struggling with the sense of home like I was, and inspiring neighbors who savoured expensive Manhattan for free by cruising through its nature and concrete jungles (on wheelchairs). Amid the research interactions, there were always people who looked nothing like me yet would make an action or voice an opinion, story, or challenge that related to me so deeply I would almost feel a neuron firing in my brain and wiring me into relevance. My struggles seemed more legitimate when others faced them as well (e.g. trying to make a place feel like home), and I felt, well, less different. An older adult here and there, a few middle schoolers I saw my present or younger self in, a handful

of parents sharing their oral histories on a phone recorder, an enthusiastic well-dressed poet in a wheelchair, a Cornell administrator, etc. Curiously, I rarely talked in any of these initiatives unless when teaching material or giving instructions. I was also not intentional about finding relatedness. Yet through each observation, participation and encounter, scheduled for the purpose of research projects or in their aftermath, bliss, relatedness and grounding to my new context started to emerge.

Stumbling upon people I partially related to while doing my academic job seemed to "activate mental states and then install them as neural traits" [146], which only germinated good in my mind, synapse by synapse. It turned out that relatedness is not something you should seek in one person, place, or institution, but rather find in the plurality of the community, one piece here and one piece there. So a beauty of difference (which I have generally posited as a challenge in the dissertation) and research "out there" [340] is that you might find relatedness in them. That is how I stopped expecting default relatedness from my campus family. In place of "default" connections, the alternative links, wires, and relational circuits cultivated through research endeavours were actively making the island a friendlier place and almost a home. This appreciation and relatedness fed back into how we did research on the island by striving to co-revise and re-deploy SLIDEs as the neighbors/participants needed, found more interesting, or asked for. For example, I was not planning on doing the senior center visit in CivicDIY because there was so much work already. But I remember rushing to the lab to set that up after the senior center director (a wonderful soul) saw me on the bus and asked "*so when are you coming?*". Situatedness and Relatedness then manifested as *accountability*.

To summarize, being out in the field is more than an apt approach to addressing moral and practical concerns in design by getting closer and embedding oneself in communities. It can help de-alienate the researcher/designer herself. A non-novel yet productive question we should ask more frequently in design research and pedagogy then is: What social roles can we play as local designers/technologists/researchers in bringing the community together, facilitating border crossings, and eliciting collective civic action? And how do these social roles in return support both accountability and our own sense of relatedness?

I should note one limitation I have experienced with research situatedness. It was a lot easier to write about my research after Covid-19 hit and I moved back to Toronto permanently. As Ingold writes, "the field is never experienced as such when you are actually there and caught up in the currents of everyday life ... it only stands out when you have left it far behind and begin to write about it" [165]. A limitation we should pursue in this vein then is where to draw the line between what is a field site and what is not and how do we create that "far behind" so we can write about it while being so local.

7.2 Design, Design Ethnography, Theory

Chapters 3 through 5 combine design, design ethnography, and critical theory. Projects in each chapter started with *design*, including of tools and our own Situated Learning Interventions with DDesign (SLIDE) - whether in a middle school unit (and the arsenal of pedagogical tools required), a service learning graduate course, or a summer design internship. Each project was run

and written as *an ethnographic account*, offering insights on how we and our communities work with difference and design in certain urban contexts. This is also evident through the fact that while each project had specific research questions at the onset, the questions and findings written in their respective chapters/papers were ultimately emergent and based on post fieldwork analysis. Lastly, because I am interested in critical theory, I engaged deeply with theory to try and interpret my work in dimensions beyond the "here is what we did, how, and what came out of it." That is how the design (here I mean it in terms of creating material things), design ethnography, theory pipeline emerged. I describe below some of the affordances and challenges of this pipeline.

On the affordances side, doing design, design ethnography, and theory was rewarding on multiple levels. Because this pipeline was done in various classes and pedagogical contexts, it provided ready access to motivated subjects, and opportunities for collaborative learning and inductive knowledge exchanges between subjects who are usually not prioritized in other design ethnography work. It helped us stay accountable because our field observations could be immediately fed back into the design in real time to revise the deployment and give participants what they preferred for the most part. In fact, whenever there was design (what we aspired to make and deploy) vs. ethnography (staying authentic to the participants) moment, ethnography won and design had to wait or get thrown out all together (see section 5.6.2 for an example). Another advantage with this pipeline was that designing and then critiquing my own work were good exercises in both humility and self-appreciation. Going from design, to ethnography and design, then theory was therefore only possible through long-term, inductive, relational and patient approach to

situated research. The data, coupled with my positionality and interests, guided my way of knowing, and I was able to live and analyze the research without feeling tethered to a theory. Instead, I went in all earnest to find theories that the findings contributed to. After all, if theory is an abstraction of reality, and the research is done in real-life contexts, then it must contribute to an epistemic framework, or it signals the lack of one (as was the case with critical unmaking). Most importantly, this pipeline has expanded my understanding of design as I describe next.

7.2.1 Revisiting the Meaning of Design

In chapter 1, I cited several definitions Carl DiSalvo offers for design [82]. What he does then is extrapolate a few features for an HCI and STS audience that "bind" the varied approaches to design. The first is that design is a deliberate approach, "taken to the invention and making of products or services to shape the environment through the manipulation of materials and experiences" [82]. The second is that design makes certain claims about society and shapes beliefs and actions, so design is open to "ethical, moral, and political critiques" [82]. Lastly, "design makes ideas, beliefs, and capacities for action experientially accessible and known" [82]. These features, while not addressing the collaborative aspects of design or more obscured dynamics such as unmaking, have been instrumental in expanding my understanding of design beyond how it is practised in architecture.

As I mentioned in the introduction, professional architecture training often starts by emphasizing that well-designed buildings must provide "firmness,

commodity, and delight" - three tenets identified by Roman architect Vitruvius Pollio. These points mean that buildings must be rigid enough to withstand structural forces and environmental factors (this includes not sagging or vibrating), they should have practical spatial accommodation, and they must offer visual, haptic, and auditory beauty. Such training has instilled in me a commitment to careful process, practical implementation, interesting metaphors, order, efficiency, and aesthetics. I therefore started the PhD seeing design primarily as a form of "expert mediation", or the creative agency of the designer and what makes the most sense pragmatically. Through the various co-design activities I engaged with in my doctoral journey, ethnographic observations, and then critical analysis, my interpretation of design has expanded in three ways.

First, design does not have to be a problem-solving, jaw-dropping, or future-looking process that takes us from state A to B. It can serve a plethora of other purposes such as gaining better understanding of a given state or problem, provoking thoughts and reactions [148], expressing matters of concern [194], or simply externalizing ideas that would otherwise remain obscure. The tools, processes, outcomes, and success metrics of such post-structuralist design will vary by the context and goal. Second, that design is (often) a social process whereby the involvement of non-professional designers is crucial. These non-professional designers (the participants from Roosevelt Island for example) are in fact experts in their own ways including on their needs and contexts; the ethnography makes this clear in this dissertation. Of course architectural conceptions of design often do not include ethnography since the focus is mainly on site analysis rather than social and historical inquiry, just as participation tends to be compartmentalized in HCI. But the the richness,

ingenuity, and expertise ethnography has shown me warrants an expanded understanding of design as the social mediation of human action, and a place to potentially resolve these antinomies in practice. Lastly unmaking *is* design because it fits many of the features listed above (and more) and is complex in its own ways as argued in the dissertation. Analogously, design itself can be a form of unmaking - e.g. designing the Remaking curriculum both unmade the expectation that ICT courses have crystal clear requirements and that productivity is only measured by technical outcomes.

7.2.2 Challenges

Doing a bricolage of design, design ethnography, and critical theory through SLIDEs was challenging for a few reasons. The first are the forms of **identity confusion** (even crisis) that come with performing all of these roles sequentially, or sometimes all at once. I did not know while doing the fieldwork whether I was a designer, ethnographer, educator, or thinker. The (ambitious) design plans I had in mind were often scratched because our work/teaching with participants was taking longer or because they had other priorities. Examples include cancelling a sketching-making session with Meaning of Home students due to time constraints and because we could not pedagogically fit it with the curriculum. Another example was forgoing site model building in CivicDIY due to the youth disinterest (or defiance more accurately) after spending a lot of time and effort into preparing the island topographical maps.

At the same time that I could not go all out on the design part, I also **did not have formal training in ethnography**. My site analysis skills in architecture

school were solid and I often paid attention to social factors more than my peers, but I could not observe human subjects the way a behavioral scientist or anthropologist might for example. Further, the real world is not the HCI lab I was familiar with and its controlled, simplified environment and sophisticated measuring equipment. I was running the research (by doing some of the teaching, taking attendance, collecting artefacts, etc.) while observing and participating given the pedagogical nature of the projects. As Ingold states, I often asked how would a researcher "watch what is going on and join in"? [165]. This was especially the case when a fellow PhD student who comes from a behavioral design background joined us during one of the Meaning of Home classes. His notes (e.g. student S1 from group G3 said X to student S4 from group G1) felt superior to mine in terms of detail and systematization. I was also against recording everything on video because some participants did not consent to it, our New York State Education Department IRB limited it, and because I thought: how would participants behave if we are being recorded? Ultimately, I did what I could: taking notes during free moments and writing down reflections at the end of the day. But I still remember my frazzled mental state: *who am I to be doing this? Take me back to the Maker Lab!*

To list a third challenge, my research in its various facets required **compromises**. An aspect of participatory design that I can not come to terms with is how it often does not fit my definition of "due process" or "aesthetic". DiSalvo actually admits that it is very challenging to achieve a "spectacular" sense of aesthetics in PD [82]. That is completely understandable as PD has far more important things to offer, but it still gave me anxiety, and I had to resort to some mitigation strategies. One was to inject aesthetics through writing - the "lyrical" [2] style of the Remaking chapter/CHI paper are an example since



Figure 7.1: Aesthetic translation from CivicDIY youth prototypes to shareable renderings

there were no visual aspects I could take over. Making my own renderings of participant prototypes and using them as the "dissemination" interface was another way of achieving quality aesthetic outputs. This process of "aesthetic take over" helped me showcase artefacts in a personally satisfying manner, as well as make certain claims or convey a certain mood. This includes placing the youth proposals on the same site (Figure 7.1) while expressing what (I believe) they had in mind. I recall Professor Wendy Ju commenting about the *excessiveness* of such post-processing but I found that to be necessary given the compromises required elsewhere in the research.

Another challenge associated with this research approach and pipeline is that it led to **overwhelming data**. The simultaneous commitment to interventions, observations, and participation (plus my interest in theory) proved to be a mammoth task. The data analysis and writing were especially challenging for this kind of work due to the longer pipeline that I had to analyze

(it was not primarily about design, and it was not primarily about ethnography). Learning to write about this work took a substantial time to get the hang of especially since I was often trying to squeeze too much in one place. My advisor did of course emphasize the need to delineate but I was unable to neatly distinguish between the empirics of a project (i.e. data and findings) and the elaborate interpretation (i.e. theorizing) until after much trial and error.

Speaking about theory, several scholars said this to me (as a critique) and it is the first time I am going to admit it: this work took a lot of **elaborate theorizing** to turn into papers. This could be a discipline specific critique, as elaborate theorizing around what might seem to be trivial or mundane aspects of the field work is common in the learning sciences, with one or two anecdotes from their field work leading to multiple papers. But back to my work, some elaborate theorizing was necessary to extrapolate the meaningful complexity I saw in the field and has meant a wild-goose chase. In *Remaking*, we found the care framework 2 months after data analysis and the writing was fast. In *CivicDIY*, I found adversarial design [82] fairly quickly after data collection, but it took a good 2-3 years for me to find the best way to make it work with agonism and unmaking. What took time was that I could not apply the agonism framework early on - *CivicDIY* just did not fit with the agonism design literature I found with its focus on making and non-confrontative conflicts. In seeing my agony (no pun intended), an advisor and collaborator noted that what we read in the design literature is just an interpretation by the authors, so we should go back to the primary sources on agonism, read them, and then offer our interpretation of the theory. I engaged in a similar process with unmaking, and learned two things from this experience. First, agonism is quite abstract, so it could be interpreted in multiple ways such as through rhetorical unmaking,

elaborate debates, or non-violent revolutions. Second, there is no theory in design (or adjacent fields) that explains unmaking in the way I was seeking, hence the suggested trajectories in chapter 6. Lastly, while I am in awe of the CivicDIY chapter/paper architecture (organizing the ethnographic parts into two episodes, each with its own reflections, adding a synthesising section after the episodes, and then moving into discussion), that took three years to fully write and publish. Is this sustainable? Not by academic standards, and it has made the analysis and writing daunting. I hope to become faster at this in the future, or perhaps I should consider a simpler research framework that omits one of the parts or starts from a specific theory.

Lastly, a general limitation in this doctoral work is the **individual and situated nature of its case studies**. Each project showcased one approach to difference, but I did not test that approach or the same pedagogical design intervention in a different context. I suspect that the observations collected and conclusions drawn would diverge if applied with other groups. In the future, more focus is needed on adding nuance and extending and refining the theoretical frameworks through the same or new contexts.

7.2.3 Remediations

An essential strategy to address the challenges I outlined above is to have a larger research team or build interdisciplinary collaborations early on. For example, it was really nice to have Professor Xanda Schofield on board Meaning of Home to build WHiGC, Aila Aamir (an NYU undergraduate student at the time) to build the paper mannequin in Proxy Objects, and Arunima Grover (A

CUNY undergraduate student) to do sentiment analysis on the Remaking data. But they were all from computer science. Having (junior) talents and expertise from sociology, anthropology, and learning sciences could therefore really expand the potential of this research approach, make data processing more manageable, and provide the necessary theories early on. Another remediation is to offer more graduate level courses on ethnography, and teach data capturing strategies (interviews, audio and video recording, field reflections, etc.) that also address the experiential aspect of ethnography and the memories, lessons, and researcher growth possibly. There are several books on the subject but nothing would substitute for the direct wisdom of an ethnographer sharing their tips and tricks with designers. Lastly, going outside the lab is not easy, especially when we are deploying and revising our own designs. Coming to terms that we humans are not going to be able to capture and write about everything is therefore important, especially that our individual positionalities skew and amplify what we find interesting and meaningful in the field. I have come to believe that what "sticks" from the field is what have been meaningful to us all along and what we are meant to make a contribution on.

7.3 Unmaking

Unmaking is an emerging field (re-emerging might actually be a more accurate word given that trends come and go in academia). It does not (and may never) have an exact definition as evident by the various articulations arising during the Unmaking@CHI'22 [301] workshop I led. In my own scholarship, I see unmaking as a mode of thinking and/or doing that centers impact over the new or novel, dampens the need to engender change by making yet more things,



Figure 7.2: Bloomberg 275

and stays with the trouble that come with doing things and interfering with the world. Unmaking can be unkind to its subjects and is uncomfortable and ethically paradoxical to adopt in our work which is why a wealth of future work is needed as I describe in sections 6.5 and 6.6. My hope in this dissertation is that we start to recognize unmaking "out there" when we see it, as we cannot continue on a trajectory of design that takes up difficult issues around power, justice, emancipation, and change without knowing about the impact, loss and friction unmaking can have.

Some time in the summer of 2021, I realized something interesting. As narrated in chapter 1, the seed for this dissertation was planted in March-April 2018 following my request through Cornell's chaplain's office to designate a prayer space at the Cornell Tech campus. The Muslim chaplain met with our facilities manager (who herself practices a religion). The facilities manager had discussions with the Cornell Tech PhD Student Association social representative and Bloomberg 275 (Figure 7.2) switched functions from a shared huddle room to a prayer room. Sharing this news did not go well in the faculty and staff

meeting and many of course could deduce that I (just one person) was behind it. The situation was remediated by switching the room function to a "reflection space" but some bitter after taste remained from multiple sides. Given what I found about unmaking, I now see this story in two new lights:

First, there were actually *two* steps involved in the BL275 story. One was to *make* the space a prayer room (which is already fractious for a secular campus). Intertwined with the making was *cancelling* the use of BL275 as a huddle room. At a small campus where space is limited, losing shareable meeting space was bound to raise objections whether BL275's ultimate destiny was a prayer room or a private office. This cancelling was done anyways despite objections. We can go one more step and say that having a hallway lined up with faculty offices end with a prayer room (with shoes left at its doorstep) both shocks and destabilizes the secular, high-tech image of campus in a way that raises objections. Unmaking is double entangled in this story and I am finally at ease with the reactions that it raised.

Second, two weeks before Covid-19 border closures made me leave Cornell Tech and settle back in Toronto, I attended the Muslim Ivy Conference held at Yale University. The BL275 story was not unique in that context, and I was gently criticized for my approach. According to the Law students there, I should have first started a campus group (on the train ride back to NYC, I thought of two such groups: Faith At Cornell Tech (FACT) or Muslims At Cornell Tech (MACT)). Then I could have advocated for a prayer space under the "veil" of that group, which according to the lawyers and politicians to be, would have given the request more legitimacy and mass. So I went about the unmaking all wrong, and without a shield. If we look at Luddism, the movement of nineteenth

century textile makers who took down machines replace their labour, they hung their activities on a mythical General Ludd. Similarly, the Communist Party in Shanghai has demolished since the 1990s millions of square meters of old housing to make room for large-scale urban renewal. But it has done that by hiring private demolition companies so that "if residents protested, the fault would appear as a private one, rather than one for which the Party was responsible" [320].

Given the potentially fractious consequences of unmaking, my participation in it should have been shielded in some way. Then I would have been less visible as a trouble unmaker on campus. But unmaking was (consciously) unknown to me back then. Now if I had the FACT or MACT shield, this dissertation might have been something else completely. Who knows if that would have been good or a bad thing.

In bidding farewell to the PhD and to you my dear reader, I must acknowledge that I got a little wiser now thanks to this dissertation and the literacy it has given me around difference, situated learning interventions with design, and (critical) unmaking. I hope that you too have found some slivers of wisdom in my recollection of this journey.

APPENDIX A

AUXILIARY EXPLORATIONS

In addition to *Meaning of Home*, *Remaking the City*, *CivicDIY*, and *Unmaking*, I led or was involved in three smaller projects: *Story Snacks* (Spring 2019), *Proxy Objects* (Summer 2019), and *Craft@Large* (Fall 2019). These smaller projects (figure A.1) are not as empirically substantial as the projects described in the main dissertation chapters and are not SDPs. I still wanted to mention them for three reasons. First, because the work in these auxiliary explorations was not pedagogical, there was enough time and space to focus on aesthetics and functioning prototypes - two commitments we did not have much time or space to honor in the primary projects. This second block of projects therefore showcases my interest and skills in building interactive devices. I found it easy to just abandon making skills in the presence of so much writing, qualitative data analysis, project management, and critical theories. But these skills are important both for job marketability and because interactive devices are a great way to give ideas a shape in the physical environment. They are also where I best find myself. Second, the auxiliary projects allowed me to apply an artefact-centric approach to test dynamics around difference in yet more contexts and ways on Roosevelt Island and helped me see the primary research findings in new lights especially the pedagogical aspects. Lastly, I found through the projects discussed below that the more community and human centered approaches of *Meaning of Home*, *Remaking*, and *CivicDIY* are potentially more meaningful because difference (given how I study it) is a social dynamic and designing for/with it needs to be enveloped in rich social contexts. Below are brief summaries of these auxiliary explorations:



Figure A.1: Auxiliary Explorations: (a) Story Snacks, (b) Proxy Objects, and (c) Craft@Large

Story Snacks were interactive devices I designed with two colleagues in the Spring of 2019 under the supervision of Professor Wendy Ju and the involvement of Professor Tapan Parikh. In leading this project, my goal was to make oral histories collected around racism from Roosevelt Island residents both fast to consume (so that they are enticing to the masses) yet slow and meaningful to cultivate awareness and action. We started the project by conducting listening explorations such as doing an island walk-and-listen activity, attending oral history listening "parties", testing listening and transcribing activities, and sitting in on poetry readings. We then designed story snacks as tangible and constrained artefacts that do not claim nor attempt to do more than play an excerpt of a story when held to the user's ear and provide a jack for playing the full story through a speaker. This concept was based on the insights we collected during the research phase which showed how challenging it is to have an intimate and meaningful listening experience of other people's stories when they are in a digital format. We conducted a user study of the Story Snacks on campus in a location with high traffic. Many passersby were intrigued by the colorful objects and stopped to ask about them. They reported

an intimate, respectful feeling that comes with bringing the sound next to the ear, and the activation method (the flap) intuitive and effortless. But many were eager for a story recording feature so that the preview grows into a bricolage of community stories, questions, and reactions. Overall, this project revealed that oral histories are a delicate medium to work with because meaningful listening is hard to achieve even for a 30-second snippet. Ultimately, I found that the method we followed in *Meaning of Home* (chapter 3) might be more impactful in terms of breaking down oral histories into meaningful segments and engaging with their nuances.

Proxy Objects were also interactive devices. I designed them to express the idea/desire/wishful thinking that devices can engage on behalf of their authors in raising issues, proposing, prescribing desired behaviors, and eliciting audience reactions around difference that exists in shared social contexts such as schools and university campuses. When placed in hallways, lounges, and labs, I envisioned these artifacts creating a break in human-human interactions, giving both the maker and audience the time, space, and autonomy to reduce the uncanny and uncomfortable nature of difference. I designed and tested two proxy objects: the Hijabi Mannequin (which creates a conversation around the headscarf worn by Muslim women) and the Hijabi and Prince (an installation about hand-shaking norms among the two genders in Islam). In terms of user engagement, proxy objects showed more promise than story snacks because I intentionally *did not* design them to be ubiquitously accessible and diffuse (a design goal with story snacks) and because I tested them in more specific contexts (e.g. with colleagues who were already interested in such engagement). More details are available in my CHI workshop paper, *Hijabies, Proxies, and Difference* [297]. This work has resonated well with Muslim scholars

(and scholars who work with Muslim participants) likely because it candidly narrates what it is like to be a Hijabi in Western context by someone who is a Hijabi herself, and because it takes an edgier approach to raising conversations around difference. This work is still underdeveloped and in-progress, and I will tend to it more in the next stage of my career.

Craft@Large (C@L) is a collaborative open studio initiative established by the Cornell Tech Maker Lab director Niti Parikh. Through C@L, community members and organizations from Roosevelt Island and beyond can pitch projects, build partnerships with students and researchers, and execute their projects using the lab tools and resources. During its pilot project, *I Can Breathe*, I helped build an interactive oral history map that tells stories of black men/poets who were victims of gun violence, reside in the island's long term hospital, and run advocacy programs for youth. The map has stunning visuals, and was a remarkable feat to build on a tight budget and deadline. But it was ultimately the co-design and co-making activities that were the most meaningful in engendering social rapport among the participants, especially because they came from a wide range of ethnicities and walks of life. I have yet to process the data but this project has an important story to tell on how to support care and rapport when deceleration (what we saw in *Remaking*) is not possible, so there has to be a bicameral approach to project time - "work" time and "care" time.

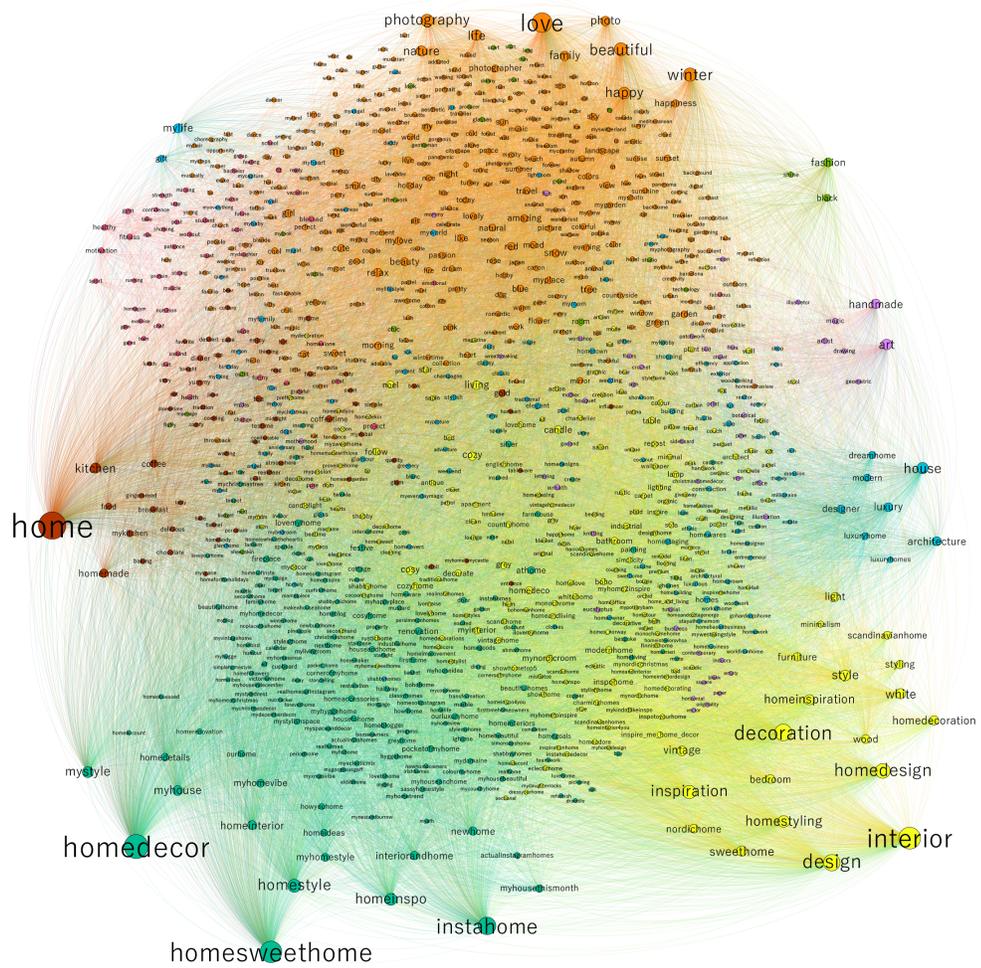


Figure B.2: Co-occurrence graph for hashtag myhome. Nodes sizes indicate their degree (i.e. how many times they co-occurred with the queried hashtag) and colors indicate themes. More legible versions are available in the appendices

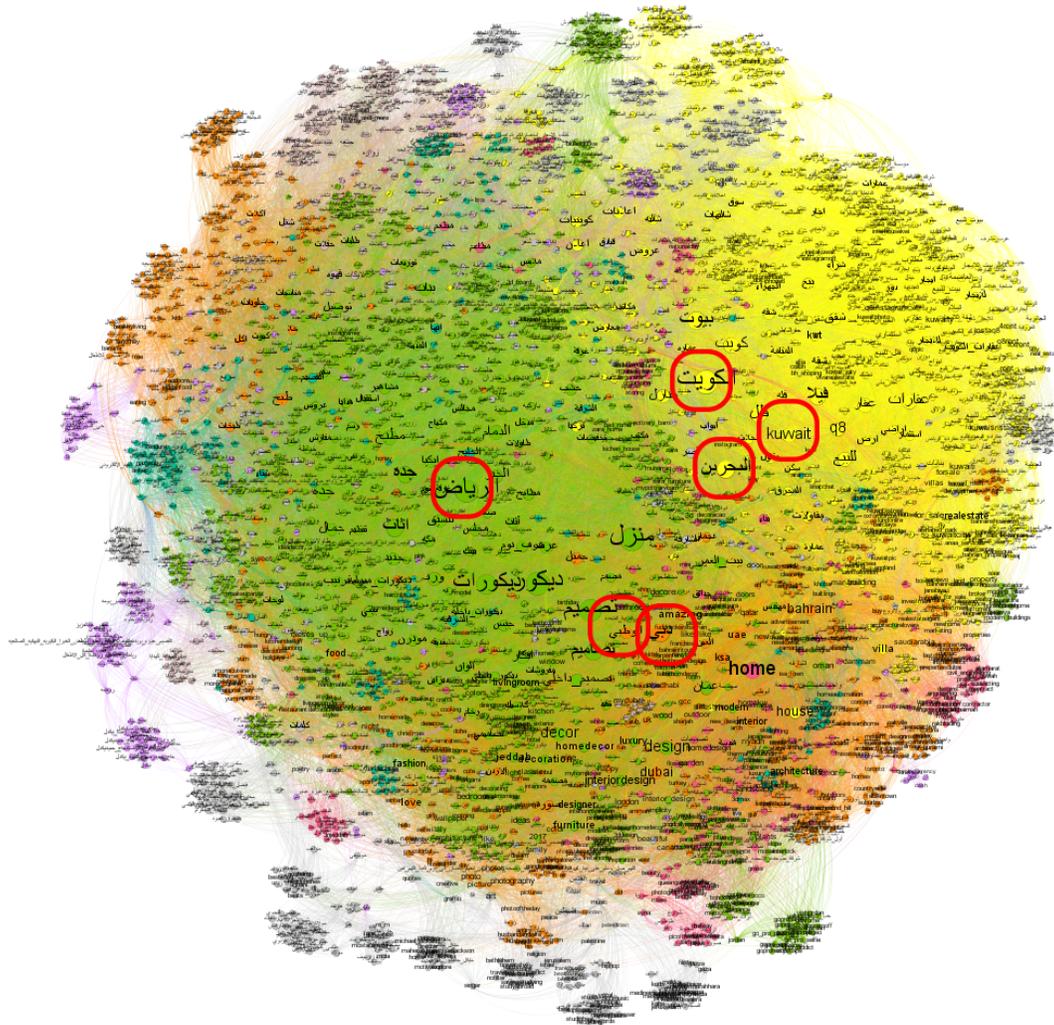


Figure B.3: Co-occurrence graph for hashtag home in Arabic. Some country names circled in red. Nodes sizes indicate their degree (i.e. how many times they co-occurred with the queried hashtag) and colors indicate themes. More legible versions are available in the appendices

B.2 Pilot Oral History Protocol

1. Where are you from? What is your hometown?
2. What are some of your favorite memories of your hometown?

3. What were your favorite places in your hometown?
4. What was your home like there?
5. What are some of your favorite memories of your home?
6. What was your favorite part of your home?
7. Where do you live now?
8. What is your home like?
9. What are your favorite places where you live now?
10. Which places remind you of where you grew up?
11. How is where you live now different or similar to where you grew up?
12. What changes would you make to your current home if you could?

B.3 Final Oral History Protocol

1. Where are you from? What is the place you'd call your hometown and why?
2. What are some of your favorite memories of your hometown?
3. What were your favorite places in your hometown?
4. Why do you choose to call this place as your hometown? What is important about it?
5. Where do you live now?
6. What are your favorite places where you live now?
7. Do any of these places remind you of where you grew up?
8. What changes would you make to your current home if you could?

9. What does home really mean to you?

APPENDIX C
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- [1] Earth 2. Earth 2: Tradable virtual land, 2021.
- [2] Andrew Abbott. Against Narrative: A Preface to Lyrical Sociology. *Sociological Theory*, 25(1):67–99, 2007.
- [3] Daniel M. Abramson. *Obsolescence: An Architectural History*. University of Chicago Press, Chicago ; London, 1 edition edition, February 2016.
- [4] Joseph Brian Adams and Erica Runkles. "May We Have Class Outside?": Implementing Service Learning in a CS1 Curriculum. *Journal of Computing Sciences in Colleges*, 19(5):25–34, May 2004.
- [5] Vincanne Adams, Michelle Murphy, and Adele E. Clarke. Anticipation: Technoscience, Life, Affect, Temporality. *Subjectivity*, 28(1):246–265, September 2009.
- [6] Ghassan Adnan and Karen Leigh. Death toll rises to 142 from baghdad blast. *The Wall Street Journal*, 2016.
- [7] Ben Agger. Theorizing the decline of discourse or the decline of theoretical discourse? In Philip WexlerThe, editor, *Critical Theory Now*, page 117–144. The Falmer Press, 1991.
- [8] Shana Agid. "...it's your project, but it's not necessarily your work...": Infrastructuring, Situatedness, and Designing Relational Practice. In *Proceedings of the 14th Participatory Design Conference, PDC'16*, pages 81–90, Aarhus, Denmark, 2016. ACM Press.
- [9] Herman Aguinis, Ryan K. Gottfredson, and Harry Joo. Best-practice recommendations for defining, identifying, and handling outliers. *Organizational Research Methods*, 16(2):270–301, January 2013.
- [10] Yoko Akama, Sarah Pink, and Annie Fergusson. Design + Ethnography + Futures: Surrendering in Uncertainty. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems, CHI EA '15*, pages 531–542, New York, NY, USA, 2015. ACM.
- [11] Abdulaziz K Al-Shammari. *The use of the oral history teaching approach in social studies towards strengthening national values and identity among Kuwaiti youth*. PhD thesis, Kansas State University, Manhattan, KS, 2021.

- [12] Gerry Albarelli and Amy Starecheski. *The Telling Lives Oral History Curriculum Guide*. Technical report, The Columbia University Center for Oral History, April 2005.
- [13] Amy Allen. *The end of progress*. *New Directions in Critical Theory*. Columbia University Press, New York, NY, October 2017.
- [14] Mike Ananny and Kate Crawford. Seeing without Knowing: Limitations of the Transparency Ideal and its Application to Algorithmic Accountability. *New Media & Society*, 20(3):973–989, March 2018.
- [15] Ian Arawjo, Ariam Mogos, Steven J. Jackson, Tapan Parikh, and Kentaro Toyama. Computing Education for Intercultural Learning: Lessons from the Nairobi Play Project. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW):52:1–52:24, November 2019.
- [16] Jo-Ann Archibald. *Indigenous Storywork: Educating the Heart, Mind, Body, and Spirit*. UBC Press, Vancouver, BC, Canada, 2008.
- [17] Hannah Arendt. *On Violence*. Harcourt, Brace, Jovanovich, 1970.
- [18] Hannah Arendt and Margaret Canovan. *The Human Condition: Second Edition*. University of Chicago Press, Chicago, second edition edition, December 1998.
- [19] Susan Armitage and Sherna Berger Gluck. Reflections on women's oral history: An exchange. *Frontiers: A Journal of Women Studies*, 19(3):1, 1998.
- [20] Alexander W. Astin, Lori J. Vogelgesang, Elaine K. Ikeda, and Jennifer A. Yee. How Service Learning Affects Students. Technical report, Higher Education Research Institute, University of California, Los Angeles, January 2000.
- [21] Melissa Atkinson-Graham, Martha Kenney, Kelly Ladd, Cameron Michael Murray, and Emily Astra-Jean Simmonds. Care in Context: Becoming an STS Researcher. *Social Studies of Science*, 45(5):738–748, October 2015.
- [22] Gaston Bachelard. *The Poetics of Space*. Beacon Press, Boston, April 1994.
- [23] Benjamin Barber. *Strong democracy : participatory politics for a new age*. University of California Press, Berkeley, 2003.

- [24] Jeffrey Bardzell and Shaowen Bardzell. What is "Critical" About Critical Design? In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '13*, pages 3297–3306, New York, NY, USA, 2013. ACM.
- [25] Jeffrey Bardzell, Shaowen Bardzell, and Lone Koefoed Hansen. Immodest Proposals: Research Through Design and Knowledge. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems, CHI '15*, pages 2093–2102, Seoul, Republic of Korea, April 2015. Association for Computing Machinery.
- [26] Shaowen Bardzell, Jeffrey Bardzell, Jodi Forlizzi, John Zimmerman, and John Antanitis. Critical design and critical theory: The challenge of designing for provocation. In *Proceedings of the Designing Interactive Systems Conference, DIS '12*, page 288–297, New York, NY, USA, 2012. Association for Computing Machinery.
- [27] Angela Calabrese Barton, Edna Tan, and Day Greenberg. The makerspace movement: Sites of possibilities for equitable opportunities to engage underrepresented youth in STEM. *Teachers College Record*, 119(7):1–44, 2017.
- [28] Karl Baumann, Benjamin Stokes, François Bar, and Ben Caldwell. Infrastructures of the Imagination: Community Design for Speculative Urban Technologies. In *Proceedings of the 8th International Conference on Communities and Technologies, C&T '17*, pages 266–269, New York, NY, USA, 2017. ACM.
- [29] Charles Beitz. *Political equality : an essay in democratic theory*. Princeton University Press, Princeton, N.J, 1989.
- [30] Seyla Benhabib, editor. *Democracy and Difference*. Princeton University Press, Princeton, N.J, July 1996.
- [31] Seyla Benhabib. Introduction. In Seyla Benhabib, editor, *Democracy and Difference*, pages 3–18. Princeton University Press, Princeton, N.J, July 1996.
- [32] Ruha Benjamin. *Race After Technology: Abolitionist Tools for the New Jim Code*. Polity, Medford, MA, 1st edition edition, June 2019.
- [33] W. Lance Bennett, Chris Wells, and Allison Rank. Young citizens and

civic learning: two paradigms of citizenship in the digital age. *Citizenship Studies*, 13(2):105–120, April 2009.

- [34] Thomas Binder, Giorgio De Michelis, Pelle Ehn, Giulio Jacucci, Per Linde, and Ina Wagner. *Design Things*. The MIT Press, Cambridge, Mass, September 2011.
- [35] Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren. Participatory Design and "Democratizing Innovation". In *Proceedings of the 11th Biennial Participatory Design Conference, PDC '10*, pages 41–50, New York, NY, USA, 2010. ACM.
- [36] Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren. Agonistic participatory design: working with marginalised social movements. *CoDesign*, 8(2-3):127–144, June 2012.
- [37] Julian Bleeker. Design Fiction: A Short Essay on Design, Science, Fact and Fiction. Technical report, Near Future Laboratory, March 2009.
- [38] Paulo Blikstein. Digital fabrication and “making” in education: The democratization of invention. In Julia Walter-Herrmann and Corinne Büching, editors, *FabLab: of machines, makers and inventors*, Cultural and media studies, pages 1–21. transcript, Bielefeld, 2013.
- [39] Jeanette Blomberg, Mark Burrell, and Greg Guest. An ethnographic approach to design. In Andrew Sears and Julie A. Jacko, editors, *Human-Computer Interaction*, pages 965–984. CRC Press, March 2003.
- [40] Mark Blythe, Kristina Andersen, Rachel Clarke, and Peter Wright. Anti-Solutionist Strategies: Seriously Silly Design Fiction. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, CHI '16*, pages 4968–4978, New York, NY, USA, May 2016. Association for Computing Machinery.
- [41] James Bohman and William Rehg. Jürgen Habermas. In Edward N. Zalta, editor, *The Stanford Encyclopedia of Philosophy*. Metaphysics Research Lab, Stanford University, online, Fall 2017 edition, 2017.
- [42] Marilynne Boyle-Baise. *Multicultural Service Learning: Educating Teachers in Diverse Communities*. Teachers College Press, New York, 2002.
- [43] Harry Chatten Boyte. A Different Kind of Politics: John Dewey and the

- Meaning of Citizenship in the 21st Century. *The Good Society*, 12(2):1–15, 2003.
- [44] Virginia Braun and Victoria Clarke. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2):77–101, January 2006.
- [45] Virginia Braun, Victoria Clarke, and Paul Weate. Using thematic analysis in sport and exercise research. In Brett Smith and Andrew C. Sparkes, editors, *Routledge Handbook of Qualitative Research in Sport and Exercise*, pages 191—205. Routledge, September 2016.
- [46] Robin Jarvis Brownlie and Roewan Crowe. 11. “so you want to hear our ghetto stories?” oral history at ndinawe youth resource centre. In Steven High, Edward Little, and Thi Ry Duong, editors, *Remembering Mass Violence: Oral History, New Media and Performance*, pages 203–218. University of Toronto Press, Toronto, 2018.
- [47] Richard Buchanan. Design and the New Rhetoric: Productive Arts in the Philosophy of Culture. *Philosophy & Rhetoric*, 34(3):183–206, 2001.
- [48] David J Burns. Motivations to Volunteer and Benefits from Service Learning: An Exploration of Marketing Students. *Journal for Advancement of Marketing Education*, 18(Summer 2011):10–23, 2011.
- [49] Jenna Burrell. How the Machine ‘Thinks’: Understanding Opacity in Machine Learning Algorithms. *Big Data & Society*, 3(1):2053951715622512, June 2016.
- [50] Marc Böhlen. Amy and klara, 2006.
- [51] Marc Böhlen. Robots with bad accents: Living with synthetic speech. *Leonardo*, 41(3):209–222, 2008.
- [52] Susanne Bødker and Morten Kyng. Participatory Design That Matters—Facing the Big Issues. *ACM Trans. Comput.-Hum. Interact.*, 25(1):4:1–4:31, February 2018.
- [53] Stephen Cairns and Jane M. Jacobs. *Buildings Must Die: A Perverse View of Architecture*. The MIT Press, Cambridge, Massachusetts, April 2014.
- [54] Julio Cammarota and Michelle Fine, editors. *Revolutionizing Education:*

Youth Participatory Action Research in Motion. Routledge, New York, NY, 1 edition edition, January 2008.

- [55] Julio Cammarota and Michelle Fine. Youth participatory action research: A pedagogy for transformational resistance. In Julio Cammarota and Michelle Fine, editors, *Revolutionizing Education*, Critical Youth Studies, pages 1–11. Routledge, London, England, apr 2010.
- [56] Limarys Caraballo and Jamila Lyiscott. Collaborative inquiry: Youth, social action, and critical qualitative research. *Action Research*, 18(2):194–211, January 2018.
- [57] Max Carlson and Ben Cervený. *State machine: Agency*, 2005.
- [58] Kathy Charmaz. Grounded theory as an emergent method. In Sharlene Biber and Patricia Leavy, editors, *Handbook of emergent methods*, page 155–170. Guilford Press, New York, 2008.
- [59] Kathy Charmaz and Linda Liska Belgrave. *Grounded Theory*. John Wiley & Sons, Ltd, New York, October 2015.
- [60] Tim Chatterton and Georgia Newmarch. The Future is Already Here: It’s Just Not Very Evenly Distributed. *Interactions*, 24(2):42–45, February 2017.
- [61] Lynda Cheshire, Hazel Easthope, and Charlotte ten Have. Unneighbourliness and the Unmaking of Home. *Housing, Theory and Society*, 38(2):133–151, March 2021.
- [62] Susan Benigni Cipolle. *Service-Learning and Social Justice: Engaging Students in Social Change*. Rowman & Littlefield Publishers, Lanham, Md, March 2010.
- [63] Andrew Clement, Brenda McPhail, Karen Louise Smith, and Joseph Ferenbok. Probing, mocking and prototyping: participatory approaches to identity infrastructuring. In *Proceedings of the 12th Participatory Design Conference: Research Papers - Volume 1*, PDC ’12, pages 21–30, Roskilde, Denmark, August 2012. Association for Computing Machinery.
- [64] Tammy Clemons. What does it mean to be “young” in the mountains? voices from the “youth activism in different generations in appalachia” oral history project. *Register of the Kentucky Historical Society*, 118(1):19–66, 2020.

- [65] Joshua Cohen. *Deliberative democracy*. In *Deliberation, Participation and Democracy*, pages 219–236. Palgrave Macmillan UK, 2007.
- [66] Randy W. Connolly. *Is There Service in Computing Service Learning?* In *Proceedings of the 43rd ACM Technical Symposium on Computer Science Education, SIGCSE '12*, pages 337–342, New York, NY, USA, 2012. ACM.
- [67] William E. Connolly. *Pluralism*. Duke University Press, Durham, USA, 2005.
- [68] Juliet M Corbin and Anselm C Strauss. *Basics of qualitative research*. SAGE Publications, Thousand Oaks, CA, 3 edition, January 2008.
- [69] Le Corbusier. *The city of to-morrow and its planning*. Dover, New York, 1987.
- [70] Julie Cruikshank. *The Social Life of Stories: Narrative and Knowledge in the Yukon Territory*. University of Nebraska Press, Lincoln, Nebraska, 1998.
- [71] V. Cuzzocrea. A Possibility to Square the Circle? Youth Uncertainty and the Imagination of Late Adulthood. *Sociological Research Online*, 23(3):671–686, 2018.
- [72] Cynthia Gordon da Cruz. Are We Really Helping Communities? A Teaching Case to Challenge Dominant Narratives about Sources of Inequity. *Journal of Community Engagement and Scholarship*, 10(1):100–108, 2017.
- [73] Robert Dahl. *Democracy and its critics*. Yale University Press, New Haven, 1989.
- [74] Robert Dallek. *Franklin D. roosevelt*. Viking, November 2017.
- [75] Michel de Certeau. *The Practice of Everyday Life*. University of California Press, Berkeley, Calif., third edition edition, December 2011.
- [76] Melissa DeJonckheere, Lisa Vaughn, and Demaree Bruck. *Youth-Led Participatory Action Research: A Collaborative Methodology for Health, Education, and Social Change*. SAGE Publications Ltd, 1 Oliver’s Yard, 55 City Road, London EC1Y 1SP United Kingdom, 2017.

- [77] Laura Devendorf, Kristina Andersen, and Aisling Kelliher. The Fundamental Uncertainties of Mothering: Finding Ways to Honor Endurance, Struggle, and Contradiction. *ACM Transactions on Computer-Human Interaction*, 27(4):26:1–26:24, September 2020.
- [78] Laura Devendorf, Kristina Andersen, Daniela K. Rosner, Ron Wakkary, and James Pierce. From HCI to HCI-Amusement: Strategies for Engaging what New Technology Makes Old. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, CHI '19, pages 1–12, New York, NY, USA, May 2019. Association for Computing Machinery.
- [79] John Dewey. *The Public and Its Problems: An Essay in Political Inquiry*. Gateway Books, Chicago, 1946.
- [80] John Dewey. *The Public and Its Problems*. Swallow Press, Athens, 1 edition edition, June 1954.
- [81] Carl DiSalvo. Community and conflict. *interactions*, 18(6):24, November 2011.
- [82] Carl DiSalvo. *Adversarial design*. MIT Press, Cambridge, Massachusetts, 2012.
- [83] Carl DiSalvo, Jonathan Lukens, Thomas Lodato, Tom Jenkins, and Tanyoung Kim. Making Public Things: How HCI Design Can Express Matters of Concern. In *Proceedings of the 32Nd Annual ACM Conference on Human Factors in Computing Systems*, CHI '14, pages 2397–2406, New York, NY, USA, 2014. ACM.
- [84] Carl DiSalvo and Andrew Clement and Volkmar Pipek. Communities: Participatory Design for, with and by Communities. In Jesper Simonsen and Toni Robertson, editors, *Routledge International Handbook of Participatory Design*, pages 182–209. Taylor & Francis Group, London, October 2012.
- [85] Kelly Dobson. *Screambody*, 1998.
- [86] Paul Dourish and Genevieve Bell. *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing*. MIT Press, Cambridge, MA, USA, April 2011.

- [87] Allison Druin. A place called childhood. *interactions*, 3(1):17–22, January 1996.
- [88] Allison Druin, Jason Stewart, David Proft, Ben Bederson, and Jim Hollan. KidPad: A Design Collaboration Between Children, Technologists, and Educators. In *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems, CHI '97*, pages 463–470, New York, NY, USA, 1997. ACM.
- [89] Anthony Dunne and Fiona Raby. *Speculative Everything: Design, Fiction, and Social Dreaming*. The MIT Press, Cambridge, Massachusetts, 2013.
- [90] Tanja Döring, Axel Sylvester, and Albrecht Schmidt. A design space for ephemeral user interfaces. In *Proceedings of the 7th International Conference on Tangible, Embedded and Embodied Interaction, TEI '13*, pages 75–82, New York, NY, USA, February 2013. Association for Computing Machinery.
- [91] Hazel Easthope. Making a Rental Property Home. *Housing Studies*, 29(5):579–596, July 2014.
- [92] Pelle Ehn. Participation in design things. In *Proceedings of the Tenth Anniversary Conference on Participatory Design 2008, PDC '08*, pages 92–101, Bloomington, Indiana, October 2008. Indiana University.
- [93] Pelle Ehn. Learning in Participatory Design as I Found It (1970–2015). In *Participatory Design for Learning*. Routledge, May 2017.
- [94] David Eickhoff, Stefanie Mueller, and Patrick Baudisch. Destructive Games: Creating Value by Destroying Valuable Physical Objects. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, CHI '16*, pages 3970–3974, New York, NY, USA, May 2016. Association for Computing Machinery.
- [95] Madeleine Elish. Moral Crumple Zones: Cautionary Tales in Human-Robot Interaction. In *Engaging Science, Technology, and Society*, Coral Gables, FL, April 2016. Social Science Research Network.
- [96] Sarah Elwood and Katharyne Mitchell. Another Politics Is Possible: Neogeographies, Visual Spatial Tactics, and Political Formation¹. *Cartographica*, 48(4):275–292, 2013.
- [97] Virginia Eubanks. *Automating Inequality: How High-Tech Tools Profile,*

Police, and Punish the Poor. St. Martin's Press, New York, NY, January 2018.

- [98] Janet Eyler and Dwight Giles. Beyond Surveys: Using the Problem Solving Interview to Assess the Impact of Service-Learning on Understanding and Critical Thinking. In Andrew Furco and Shelley H. Billig, editors, *Service-Learning: The Essence of the Pedagogy*, pages 147–159. Information Age Publishing, Greenwich, 2002.
- [99] Giuseppe Feola. Degrowth and the Unmaking of Capitalism. *ACME: An International Journal for Critical Geographies*, 18(4):977–997, September 2019.
- [100] Filarete. *Treatise on architecture: being the treatise by Antonio di Piero Averlino, known as Filarete*. Yale University Press, New Haven, 1965.
- [101] Ruth Fincher and Jane M Jacobs, editors. *Cities of difference*. Democracy and Ecology. Guilford Publications, New York, NY, May 1998.
- [102] Sally Fincher and Marian Petre, editors. *Computer Science Education Research*. Taylor & Francis Group, January 2014.
- [103] Michelle Fine. Postcards from Metro America: Reflections on Youth Participatory Action Research for Urban Justice. *The Urban Review*, 41(1):1–6, March 2009.
- [104] Michelle Fine, Samuel Finesurrey, Arnaldo Rodriguez, Joel Almonte, Alondra Contreras, and Aidan Lam. “people are demanding justice”: Pandemics, protests, and remote learning through the eyes of immigrant youth of color. *Journal of Adolescent Research*, 36(5):437–466, 2021.
- [105] Michelle Fine, Eve Tuck, and Sarah Zeller-Berkman. Do You Believe in Geneva? Methods and Ethics at the Global-Local Nexus. In *Handbook of Critical and Indigenous Methodologies*, pages 157–180. SAGE Publications, Inc., 2455 Teller Road, Thousand Oaks California 91320 United States, 2008.
- [106] Constance Flanagan and Peter Levine. Civic Engagement and the Transition to Adulthood. *The Future of Children*, 20(1):159–179, 2010.
- [107] Sarah Fletcher and Jennifer Mullett. Digital stories as a tool for health promotion and youth engagement. *Canadian Journal of Public Health*, 107(2):e183–e187, March 2016.

- [108] Uwe Flick, editor. *Managing quality in qualitative research*. Sage Publications, Christchurch, New Zealand, January 2008.
- [109] Aga Khan Award for Architecture. Reconstruction of Nahr el-Bared Refugee Camp.
- [110] Pennie G. Foster-Fishman, Kristen M. Law, Lauren F. Lichty, and Christina Aoun. Youth ReACT for social change: A method for youth participatory action research. *American Journal of Community Psychology*, 46(1-2):67–83, July 2010.
- [111] Karen A. Franck. *Architecture timed: designing with time in mind*. Number no 239 in Architectural design Profile. John Wiley & Sons, London, 2016.
- [112] Christopher Frauenberger, Katta Spiel, Laura Scheepmaker, and Irene Posch. *Nurturing Constructive Disagreement - Agonistic Design with Neurodiverse Children*, page 1–11. Association for Computing Machinery, New York, NY, USA, 2019.
- [113] Paulo Freire and Myra Bergman Ramos. *Pedagogy of the oppressed*. Seabury Press, New York, 1970.
- [114] Michael Frisch. *A Shared Authority: Essays on the Craft and Meaning of Oral and Public History*. State University of New York Press, Albany, May 1990.
- [115] Michael Frisch and Douglas Lambert. Case study: Between the raw and the cooked in oral history: Notes from the kitchen. In Donald A. Ritchie, editor, *The Oxford Handbook of Oral History*, pages 1–17. Oxford University Press, online, September 2012.
- [116] Tony Fry. *New Design Philosophy: An Introduction to Defuturing*. University of New South Wales Press, Sydney, first edition edition, July 1999.
- [117] Tony Fry. The Voice of Sustainment: An Introduction. *Design Philosophy Papers*, 1(1):41–48, February 2003.
- [118] Tony Fry. Why Philosophy?: The Voice of Sustainment. *Design Philosophy Papers*, 1(2):83–90, April 2003.
- [119] Tony Fry. *Design Futuring: Sustainability, Ethics and New Practice*. Bloomsbury Academic, Oxford ; New York, December 2008.

- [120] Tony Fry. A Political Lexicon on Design, August 2018.
- [121] Masanobu Fukuoka. *The One-Straw Revolution: An Introduction to Natural Farming*. Rodale Press, Emmaus, 1978.
- [122] Andrew Furco. Is Service-Learning Really Better Than Community Service? In Andrew Furco and Shelley H. Billigs, editors, *Service Learning: The Essence of the Pedagogy*, pages 23–50. Information Age Pub, Greenwich, CT, 1996.
- [123] Patricia Garcia, Cecilia Henríquez Fernández, and Ashley Jackson. Counternarratives of Youth Participation Among Black Girls. *Youth & Society*, 52(8):1479–1500, November 2020.
- [124] Bill Gaver and Heather Martin. Alternatives: exploring information appliances through conceptual design proposals. In *Proceedings of the SIGCHI conference on Human Factors in Computing Systems, CHI '00*, pages 209–216, The Hague, The Netherlands, April 2000. Association for Computing Machinery.
- [125] Karl-Heinz Gerholz, Verena Liszt, and Katrin B Klingsieck. Effects of Learning Design Patterns in Service Learning Courses. *Active Learning in Higher Education*, 19(1):47–59, March 2018.
- [126] Michael Gibbert, Lakshmi Balachandran Nair, Matthias Weiss, and Martin Hoegl. Using outliers for theory building. *Organizational Research Methods*, 24(1):172–181, January 2020.
- [127] Shawn Ginwright and Julio Cammarota. Youth activism in the urban community: learning critical civic praxis within community organizations. *International Journal of Qualitative Studies in Education*, 20(6):693–710, November 2007.
- [128] Henry A. Giroux. Rethinking Education as the Practice of Freedom: Paulo Freire and the Promise of Critical Pedagogy. *Policy Futures in Education*, 8(6):715–721, December 2010.
- [129] Barney G Glaser. *Basics of grounded theory analysis : emergence vs forcing*. Sociology Press, Mill Valley, CA, 1992.
- [130] Barney G Glaser and Anselm L Strauss. *Discovery of grounded theory*. AldineTransaction, Somerset, NJ, December 1999.

- [131] Erving Goffman. *The Presentation of Self in Everyday Life*. Anchor, New York, NY, 1 edition edition, June 1959.
- [132] Norma. González, Luis C. Moll, and Cathy. Amanti, editors. *Funds of knowledge: theorizing practices in households, communities, and classrooms*. L. Erlbaum Associates, Mahwah, N.J., 2005.
- [133] Michele A. Govekar and Meenakshi Rishi. Service Learning: Bringing Real-World Education Into the B-School Classroom. *Journal of Education for Business*, 83(1):3–10, January 2007.
- [134] Antonio Gramsci. *Selections from the prison notebooks of Antonio Gramsci*. International Publishers, December 1971.
- [135] Katie Grantham, Deborah Moore-Russo, and Kemper Lewis. Comparing Physical and Cyber-Enhanced Dissection: An Analysis From Multiple Perspectives. *International Journal of Engineering Education*, 16(6):1378–1390, January 2010.
- [136] Jean Griffin, Eliot Kaplan, and Quinn Burke. Debug’ems and other Deconstruction Kits for STEM learning. In *IEEE 2nd Integrated STEM Education Conference*, pages 1–4, Ewing, NJ, USA, March 2012. IEEE.
- [137] Monique Guishard, Michelle Fine, Christine Doyle, Jeunesse Jackson, Travis Staten, and Ashley Webb. The bronx on the move: Participatory consultation with mothers and youth. *Journal of Educational and Psychological Consultation*, 16(1-2):35–54, June 2005.
- [138] Kris D Gutiérrez, A Susan Jurow, and Sepehr Vakil. Social Design-Based experiments. In *Handbook of the Cultural Foundations of Learning*, pages 330–347. Routledge, New York, NY: Routledge, 2020., May 2020.
- [139] Kris D. Gutiérrez. Developing a Sociocritical Literacy in the Third Space. *Reading Research Quarterly*, 43(2):148–164, April 2008.
- [140] Kris D. Gutiérrez. Designing Resilient Ecologies: Social Design Experiments and a New Social Imagination. *Educational Researcher*, 45(3):187–196, April 2016.
- [141] Kris D. Gutiérrez. Social Design–Based Experiments: A Proleptic Approach to Literacy. *Literacy Research: Theory, Method, and Practice*, 67(1):86–108, November 2018.

- [142] Joshua P. Gutwill, Nina Hido, and Lisa Sindorf. Research to Practice: Observing Learning in Tinkering Activities. *Curator: The Museum Journal*, 58(2):151–168, April 2015.
- [143] Jurgen Habermas. *The theory of communicative action*. Theory of Communicative Action. Beacon Press, March 1984.
- [144] Jürgen Habermas. Three Normative Models of Democracy. *Constellations*, 1(1):1–10, December 1994.
- [145] Charles Hannon. Service Learning in Information Technology Leadership: A Natural Connection. *Peer Review*, 8(4):16–19, 2006.
- [146] Rick Hanson. *Hardwiring happiness*. Harmony, October 2013.
- [147] Karin Hansson, Jaz Hee-jeong Choi, Tessy Cerratto Pargman, Shaowen Bardzell, Laura Forlano, Carl DiSalvo, Silvia Lindtner, and Somya Joshi. Ting: Making Publics Through Provocation, Conflict and Appropriation. In *Proceedings of the 14th Participatory Design Conference: Short Papers, Interactive Exhibitions, Workshops - Volume 2*, PDC '16, pages 109–110, New York, NY, USA, 2016. ACM.
- [148] Karin Hansson, Laura Forlano, Jaz Hee-jeong Choi, Carl DiSalvo, Teresa Cerratto Pargman, Shaowen Bardzell, Silvia Lindtner, and Somya Joshi. Provocation, Conflict, and Appropriation: The Role of the Designer in Making Publics. *Design Issues*, 34(4):3–7, September 2018.
- [149] Usman Haque and Matthew Fuller. Networking Overload, with Potplants: An interview about the Natural Fuse project. *Thresholds*, future (2010)(8):40–45, 2010.
- [150] Ellie Harmon, Matthias Korn, Ann Light, and Amy Volda. Designing Against the Status Quo. In *Proceedings of the 2016 ACM Conference Companion Publication on Designing Interactive Systems*, DIS '16 Companion, pages 65–68, Brisbane, QLD, Australia, June 2016. Association for Computing Machinery.
- [151] Christina Harrington, Sheena Erete, and Anne Marie Piper. Deconstructing community-based collaborative design: Towards more equitable participatory design engagements. *Proc. ACM Hum.-Comput. Interact.*, 3(CSCW), nov 2019.

- [152] Neil Harris. *Building Lives: Constructing Rites and Passages*. Yale University Press, New Haven, January 1999.
- [153] Andrew Hatala, Lisa Erickson, Osemis Isbister-Bear, Stryker Calvez, Kelley Naytowhow, Tamara Pearl, Omeasoo Wahpasiw, Rachel Engler-Stringer, and Pamela Downe. The Interpersonal Skills of Community-Engaged Scholarship: Insights from Collaborators Working at the University of Saskatchewan's Community Engagement Office. *Journal of Community Engagement and Scholarship*, 10:44–58, September 2017.
- [154] Elisabeth Hayes and Sondra Cuban. Border Pedagogy: A Critical Framework for Service-Learning. *Michigan Journal of Community Service Learning*, 4(1):72–80, 1997.
- [155] Heroku. Heroku platform, 2007.
- [156] Pepita Hesselberth. Discourses on disconnectivity and the right to disconnect. *New Media and Society*, 20(5):1994–2010, jun 2017.
- [157] Steven High. Listening across difference: Oral history as learning landscape. *LEARNing Landscapes*, 11(2):39–47, July 2018.
- [158] Edward A. Hirsch. *Contestational design : innovation for political activism*. Thesis, Massachusetts Institute of Technology, 2008.
- [159] Andrew Gary Darwin Holmes. Researcher positionality - a consideration of its influence and place in qualitative research - a new researcher guide. *Shanlax International Journal of Education*, 8(4):1–10, September 2020.
- [160] Bonnie Honig. Difference, Dilemmas, and the Politics of Home. In Seyla Benhabib, editor, *Democracy and Difference: Contesting the Boundaries of the Political*, pages 257–277. Princeton University Press, Princeton, N.J, July 1996.
- [161] Elaine M. Huang and Khai N. Truong. Breaking the disposable technology paradigm: opportunities for sustainable interaction design for mobile phones. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '08*, pages 323–332, New York, NY, USA, April 2008. Association for Computing Machinery.
- [162] Netta Iivari and Kari Kuutti. Critical Design Research and Information Technology: Searching for Empowering Design. In *Proceedings of the*

2017 *Conference on Designing Interactive Systems, DIS '17*, pages 983–993, Edinburgh, United Kingdom, June 2017. Association for Computing Machinery.

- [163] Miwa Ikemiya and Daniela K. Rosner. Broken probes: toward the design of worn media. *Personal and Ubiquitous Computing*, 18(3):671–683, March 2014.
- [164] Elaine R Ingham and Matthew D Slaughter. The Soil Foodweb – Soil and Composts as Living Ecosystems. In *International Conference Soil and Compost Eco-Biology*, pages 127–139, León, Spain, September 2014.
- [165] TIM INGOLD. That’s enough about ethnography! *HAU: Journal of Ethnographic Theory*, 4(1):383–395, June 2014.
- [166] Lilly Irani, Janet Vertesi, Paul Dourish, Kavita Philip, and Rebecca E. Grinter. Postcolonial computing: a lens on design and development. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pages 1311–1320. Association for Computing Machinery, New York, NY, USA, April 2010.
- [167] M. M. Irfan and P. Sammaiah. Service Learning Course in the Engineering Curriculum: EPICS. *Journal of Engineering Education Transformations*, 30(Special Issue), 2017.
- [168] Steven J. Jackson. Rethinking Repair. In Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot, editors, *Media Technologies*, pages 221–240. The MIT Press, February 2014.
- [169] Steven J. Jackson. Speed, Time, Infrastructure: Temporalities of Breakdown, Maintenance, and Repair. In Judy Wajcman and Nigel Dodd, editors, *The Sociology of Speed: Digital, Organizational, and Social Temporalities*, pages 169–186. Oxford University Press, December 2016.
- [170] Steven J. Jackson and Laewoo Kang. Breakdown, Obsolescence and Reuse: HCI and the Art of Repair. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '14*, pages 449–458, New York, NY, USA, 2014. ACM.
- [171] Steven J. Jackson, Alex Pompe, and Gabriel Krieschok. Things fall apart: maintenance, repair, and technology for education initiatives in rural Namibia. In *Proceedings of the 2011 iConference, iConference '11*, pages

83–90, New York, NY, USA, February 2011. Association for Computing Machinery.

- [172] Steven J. Jackson, Alex Pompe, and Gabriel Krieshok. Repair Worlds: Maintenance, Repair, and ICT for Development in Rural Namibia. In *Proceedings of the ACM 2012 Conference on Computer Supported Cooperative Work, CSCW '12*, pages 107–116, New York, NY, USA, 2012. ACM.
- [173] Jane Jacobs. *The Death and Life of Great American Cities*. Vintage, New York, 1rev edition edition, December 1992.
- [174] Valerie J. Janesick. Oral history interviewing. In Patricia Leavy, editor, *The Oxford Handbook of Qualitative Research*, pages 299–314. Oxford University Press, New York, USA, July 2014.
- [175] Henry Jenkins. *Convergence Culture: Where Old and New Media Collide*. NYU Press, New York, NY, updated ed. edition edition, September 2008.
- [176] Charles Jenks. Using oral history in the elementary school classroom. *Social Studies and the Young Learner*, 23(1):31–32, 2010.
- [177] Laura Ruth Johnson and Enid Marie Rosario-Ramos. The Role of Educational Institutions in the Development of Critical Literacy and Transformative Action. *Theory Into Practice*, 51(1):49–56, January 2012.
- [178] Helena Karasti. Infrastructuring in Participatory Design. In *Proceedings of the 13th Participatory Design Conference: Research Papers - Volume 1, PDC '14*, pages 141–150, New York, NY, USA, 2014. ACM.
- [179] Helena Karasti and Karen S. Baker. Community design: Growing one's own information infrastructure. In *Proceedings of the Tenth Anniversary Conference on Participatory Design 2008, PDC '08*, page 217–220, USA, 2008. Indiana University.
- [180] Naveena Karusala, Aditya Vishwanath, Arkadeep Kumar, Aman Mangal, and Neha Kumar. Care As a Resource in Underserved Learning Environments. *Proc. ACM Hum.-Comput. Interact.*, 1(CSCW):104:1–104:22, December 2017.
- [181] Tamara Kneese. Breakdown as method: Screenshots for dying worlds. *Media Theory*, 5(2):141–166, 2022.

- [182] Are John Knudsen. Decade of despair: The contested rebuilding of the nahr al-bared refugee camp, lebanon, 2007–2017. *Refuge*, 34(2):135–149, dec 2018.
- [183] Matthias Korn and Amy Volda. Creating Friction: Infrastructuring Civic Engagement in Everyday Life. In *Proceedings of The Fifth Decennial Aarhus Conference on Critical Alternatives*, CA '15, pages 145–156, Aarhus, Denmark, 2015. Aarhus University Press.
- [184] Manfred Kraus. Charles s. peirce's theory of abduction and the aristotelian enthymeme from signs. In Frans H. Van Eemeren, J. Anthony Blair, Charles A. Willard, and A. Francisca Snoeck Henkemans, editors, *Anyone Who Has a View: Theoretical Contributions to the Study of Argumentation*, pages 237–254. Springer Netherlands, Dordrecht, 2003.
- [185] KTRK. Bookstore bans Wi-Fi, makes customers read books, November 2016.
- [186] Daniella Kuzmanovic. *Qualitative Analysis in the Making*. Routledge, Abingdon, Oxfordshire, 2014.
- [187] Will Kymlicka. Three forms of group-differentiated citizenship in canada. In Seyla Benhabib, editor, *Democracy and Difference: Contesting the Boundaries of the Political*, pages 153–170. Princeton University Press, Princeton, N.J, July 1996.
- [188] Ernesto Laclau and Chantal Mouffe. *Hegemony And Socialist Strategy: Towards A Radical Democratic Politics*. Verso, London, 2nd ed. edition edition, January 2014.
- [189] Bruno Latour. *Politics of nature : how to bring the sciences into democracy*. Harvard University Press, Cambridge, Mass, 2004.
- [190] Bruno Latour. From realpolitik to dingpolitik: or how to make things public. In Bruno Latour and Peter Weibel, editors, *Making Things Public: Atmospheres of Democracy*, pages 4–31. The MIT Press, Cambridge, Mass. : Karlsruhe, Germany, September 2005.
- [191] John Law and Michel Callon. The life and death of an aircraft: a network analysis of technical change. In Wiebe E. Bijker and John Law, editors, *Shaping technology/building society studies in sociotechnical change*, Inside technology. MIT Press, Cambridge, Mass, 1992.

- [192] Shaimaa Lazem, Danilo Giglito, Makuochi Samuel Nkwo, Hafeni Mthoko, Jessica Upani, and Anicia Peters. Challenges and Paradoxes in Decolonising HCI: A Critical Discussion. *Computer Supported Cooperative Work (CSCW)*, July 2021.
- [193] Christopher A. Le Dantec. *Designing publics*. Design thinking, design theory. The MIT Press, Cambridge, Massachusetts, 2016.
- [194] Christopher A Le Dantec and Carl DiSalvo. Infrastructuring and the Formation of Publics in Participatory Design. *Social Studies of Science*, 43(2):241–264, April 2013.
- [195] Christopher A. Le Dantec and Sarah Fox. Strangers at the Gate: Gaining Access, Building Rapport, and Co-Constructing Community-Based Research. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing, CSCW '15*, pages 1348–1358, New York, NY, USA, 2015. ACM.
- [196] Patricia Leavy. *Oral History*. Oxford University Press, Oxford, England, March 2011.
- [197] Patricia Leavy and Sharlene Nagy Hesse-Biber. *Approaches to qualitative research: A reader on theory and practice*. Oxford University Press, Oxford, 2004.
- [198] Henri Lefebvre. *Critique of everyday life*. Verso, London ; New York, special ed edition, 2008.
- [199] Karen E. C. Levy. The Contexts of Control: Information, Power, and Truck-Driving Work. *The Information Society*, 31(2):160–174, March 2015.
- [200] Leah A. Lievrouw. Oppositional and activist new media: remediation, reconfiguration, participation. In *Proceedings of the ninth conference on Participatory design: Expanding boundaries in design - Volume 1*, PDC '06, pages 115–124, Trento, Italy, August 2006. Association for Computing Machinery.
- [201] Ann Light and Yoko Akama. Structuring Future Social Relations: The Politics of Care in Participatory Practice. In *Proceedings of the 13th Participatory Design Conference: Research Papers - Volume 1*, PDC '14, pages 151–160, New York, NY, USA, 2014. ACM.

- [202] Siân Lindley, Robert Corish, Elsa Kosmack Vaara, Pedro Ferreira, and Vygandas Simbelis. Changing perspectives of time in HCI. In *CHI '13 Extended Abstracts on Human Factors in Computing Systems*, CHI EA '13, pages 3211–3214, New York, NY, USA, April 2013. Association for Computing Machinery.
- [203] Kristina Lindström and Åsa Ståhl. Un/Making in the Aftermath of Design. In *Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 1*, PDC '20, pages 12–21, New York, NY, USA, June 2020. Association for Computing Machinery.
- [204] Panagiotis K. Linos. Ten Years of EPICS at Butler University: Experiences from Crafting a Service-Learning Program for Computer Science and Software Engineering. In Brian A. Nejme, editor, *Service-Learning in the Computer and Information Sciences*, pages 39–75. Wiley-IEEE Press, 2012.
- [205] Cameron Logan. Buildings Must Die: A Perverse View of Architecture. *Architectural Theory Review*, 21(1):108–110, January 2017.
- [206] Audre Lorde. *Collected Poems of Audre Lorde*. WW Norton, New York, February 2000.
- [207] Bronwen E. Low and Emmanuelle Sonntag. Towards a pedagogy of listening: teaching and learning from life stories of human rights violations. *Journal of Curriculum Studies*, 45(6):768–789, December 2013.
- [208] David Lowenthal. *The past is a foreign country*. Cambridge University Press, Cambridge Cambridgeshire New York, 1985.
- [209] Michal Luria, Ophir Sheriff, Marian Boo, Jodi Forlizzi, and Amit Zoran. Destruction, Catharsis, and Emotional Release in Human-Robot Interaction. *ACM Transactions on Human-Robot Interaction*, 9(4):22:1–22:19, June 2020.
- [210] Leah Maestri and Ron Wakkary. Understanding repair as a creative process of everyday design. In *Proceedings of the 8th ACM conference on Creativity and cognition, C&C '11*, pages 81–90, New York, NY, USA, November 2011. Association for Computing Machinery.
- [211] Henry Mainsah and Andrew Morrison. Social Media, Design and Civic Engagement by Youth: A Cultural View. In *Proceedings of the 12th Participatory Design Conference: Research Papers - Volume 1*, PDC '12, pages 1–9, New York, NY, USA, 2012. ACM.

- [212] Annapurna Mamidipudi. Constructing Common Knowledge: Design Practice for Social Change in Craft Livelihoods in India. *Design Issues*, 34(4):37–50, October 2018.
- [213] Jane Mansbridge. Using Power/Fighting Power: The Polity. In Seyla Benhabib, editor, *Democracy and Difference: Contesting the Boundaries of the Political*, pages 46–66. Princeton University Press, Princeton, N.J, July 1996.
- [214] Joanne E. Marciano and Alecia Beymer. Collaborative data analysis: examining youths’ literacy practices in YPAR. *English Teaching: Practice & Critique*, 21(2):209–224, March 2022.
- [215] Noortje Marres. The issues deserve more credit. *Social Studies of Science*, 37(5):759–780, October 2007.
- [216] Aryn Martin, Natasha Myers, and Ana Viseu. The Politics of Care in Technoscience. *Social Studies of Science*, 45(5):625–641, October 2015.
- [217] David Matijasevich. *Radical Democracy and Its Limits*. Springer International Publishing, Cham, 2019.
- [218] Andrew Kachites McCallum. Mallet: A machine learning for language toolkit. <http://mallet.cs.umass.edu>, 2002.
- [219] Todd Mclellan. *Things Come Apart: A Teardown Manual For Modern Living*. Thames and Hudson, London ; New York, May 2013.
- [220] David E McNabb. *Research methods for political science*. Routledge, London, England, 2 edition, April 2016.
- [221] Gladys McPherson and Sally Thorne. Exploiting exceptions to enhance interpretive qualitative health research: Insights from a study of cancer communication. *International Journal of Qualitative Methods*, 5(2):73–86, June 2006.
- [222] Gustav Metzger. *Auto-destructive art: Metzger at AA*. Destruction/Creation, [London, 1965.
- [223] Jed Metzger. Teaching Civic Engagement: Evaluating an Integrative Service-Learning Program. *Gateways: International Journal of Community Research and Engagement*, 5:98–114, 2012.

- [224] Stanley Milgram and Thomas Blass. *The Individual in a Social World: Essays and Experiments*. Pinter & Martin Ltd, London, 3rd expanded ed. edition edition, November 2010.
- [225] Nicole Mirra, Jerica Coffey, and Ashley Englander. Warrior Scholars & Bridge Builders: Civic Dreaming in ELA Classrooms. *Journal of Literacy Research*, 50:423–445, June 2018.
- [226] Nicole Mirra and Antero Garcia. Civic Participation Reimagined: Youth Interrogation and Innovation in the Multimodal Public Sphere. *Review of Research in Education*, 41(1):136–158, March 2017.
- [227] Nicole Mirra and Antero Garcia. “I Hesitate but I Do Have Hope”: Youth Speculative Civic Literacies for Troubled Times. *Harvard Educational Review*, 90(2):295–321, June 2020.
- [228] Nicole Mirra and Ernest Morrell. *Educating for Empathy: Literacy Learning and Civic Engagement*. Teachers College Press, New York, NY, August 2018.
- [229] Katharyne Mitchell and Sarah Elwood. Mapping Children’s Politics: The Promise of Articulation and the Limits of Nonrepresentational Theory:. *Environment and Planning D: Society and Space*, 30(5):788–804, January 2012.
- [230] Tania D Mitchell. Traditional vs. Critical Service-Learning: Engaging the Literature to Differentiate Two Models. *Michigan Journal of Community Service Learning*, 14(2):50–65, 2008.
- [231] Tania D. Mitchell. Using a Critical Service-Learning Approach to Facilitate Civic Identity Development. *Theory into Practice*, 54(1):20–28, January 2015.
- [232] Barbara E. Moely and Vincent Ilustre. The Impact of Service-Learning Course Characteristics on University Students’ Learning Outcomes. *Michigan Journal of Community Service Learning*, 21(1):5–16, 2014.
- [233] Annemarie Mol and John Law. Complexities: An introduction. In John Law, Annemarie Mol, Barbara Herrnstein Smith, and E. Roy Weintraub, editors, *Complexities: Social Studies of Knowledge Practices*, pages 1–23. Duke University Press, New York, USA, 2002.
- [234] Annemarie Mol, Ingunn Moser, and Jeannette Pols, editors. *Care in*

- Practice: On Tinkering in Clinics, Homes and Farms.* Transcript-Verlag, Bielefeld, Germany, June 2010.
- [235] Bill Mollison. *Permaculture: A Designers' Manual.* Tagari Publications, Tyalgum, N.S.W., Australia, 1992.
- [236] Mohsen Mostafavi and David Leatherbarrow. *On Weathering: The Life of Buildings in Time.* The MIT Press, Cambridge, Mass, first edition edition edition, March 1993.
- [237] Chantal Mouffe. *The return of the political.* Verso, London, 1993.
- [238] Chantal Mouffe. Democracy, Power, and the “Political”. In Seyla Benhabib, editor, *Democracy and Difference: Contesting the Boundaries of the Political*, pages 245–256. Princeton University Press, Princeton, N.J, July 1996.
- [239] Chantal Mouffe. Deliberative Democracy or Agonistic Pluralism? *Social Research*, 66(3):745–758, 1999.
- [240] Chantal Mouffe. Artistic Activism and Agonistic Spaces. *Art and Research*, 1(2):1–5, 2007.
- [241] Chantal Mouffe. *The Democratic Paradox.* Verso, London, June 2009.
- [242] Gavin Mueller. *Breaking Things at Work: The Luddites Are Right About Why You Hate Your Job.* Verso Books, Brooklyn, 2021.
- [243] Stefanie Mueller, Martin Fritzsche, Jan Kossmann, Maximilian Schneider, Jonathan Striebel, and Patrick Baudisch. Scotty: Relocating Physical Objects Across Distances Using Destructive Scanning, Encryption, and 3D Printing. In *Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '15, pages 233–240, New York, NY, USA, January 2015. Association for Computing Machinery.
- [244] Martin Murer, Verena Fuchsberger, and Manfred Tscheligi. Un-Crafting: De-Constructive Engagements with Interactive Artifacts. In *Proceedings of the Eleventh International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '17, pages 67–77, New York, NY, USA, March 2017. Association for Computing Machinery.
- [245] Martin Murer, Anna Vallgård, Mattias Jacobsson, and Manfred

- Tscheligi. Un-Crafting: Exploring Tangible Practices for Deconstruction in Interactive System Design. In *Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '15, pages 469–472, New York, NY, USA, January 2015. Association for Computing Machinery.
- [246] Michelle Murphy. Unsettling Care: Troubling Transnational Itineraries of Care in Feminist Health Practices. *Social Studies of Science*, 45(5):717–737, October 2015.
- [247] Rodica Neamtu. The Classroom as an Extension of Our Society: Empowering Students through Technology in Service Learning to Bridge the Global Digital Divide. *Procedia - Social and Behavioral Sciences*, 106:2636–2644, December 2013.
- [248] Brian A. Nejmeh. Preface. In Brian A. Nejmeh, editor, *Service-Learning in Computer and Information Sciences: Practical Applications in Engineering Education*. Wiley-Blackwell, Hoboken, NJ, 2012.
- [249] Lucy Newby. Troubled generations? (de)constructing narratives of youth experience in the northern ireland conflict. *Journal of War & Culture Studies*, 14(1):6–24, January 2021.
- [250] Safiya Umoja Noble. *Algorithms of Oppression: How Search Engines Reinforce Racism*. NYU Press, New York, 1 edition edition, February 2018.
- [251] Pedro Noguera, Julio Cammarota, and Shawn Ginwright, editors. *Beyond Resistance! Youth Activism and Community Change: New Democratic Possibilities for Practice and Policy for America's Youth*. Routledge, New York, 1 edition edition, March 2006.
- [252] Martha Norkunas. Teaching to listen: Listening exercises and self-reflexive journals. *The Oral History Review*, 38(1):63–108, January 2011.
- [253] Agnieszka Nowak-Brzezińska and Weronika Łazarz. Qualitative data clustering to detect outliers. *Entropy*, 23(7):869, July 2021.
- [254] W. Oakes and J. Spencer. EPICS: Engineering Projects in Community Service. *34th Annual Frontiers in Education, 2004. FIE 2004.*, 21(1):139–150, 2005.

- [255] Michael Oakeshott. *Rationalism in Politics and Other Essays*. Liberty Fund, Indianapolis, June 1991.
- [256] Bjørnar Olsen and Þóra Pétursdóttir. *Ruin Memories: Materialities, Aesthetics and the Archaeology of the Recent Past*. Routledge, April 2014.
- [257] Richard P. Onderdonk. Piaget and oral history: Cognitive development in the secondary social studies class. *The Oral History Review*, 11:75–85, 1983.
- [258] Kate Orff. What is Design Now? Unmaking the Landscape. *Architectural Design*, 90(1):94–99, January 2020.
- [259] Julian E. Orr. *Talking about Machines: An Ethnography of a Modern Job*. ILR Press, Ithaca, N.Y, October 1996.
- [260] Tapan Parikh and Samar Sabie. On destruction in design. *ACM SIGCAS Computers and Society*, 49(3):14–15, January 2021.
- [261] Tina Patel. The usefulness of oral life (hi)story to understand and empower: The case of trans-racial adoption. *Qualitative Social Work*, 4(3):327–345, 2005.
- [262] Eric Paulos and Elizabeth Goodman. The Familiar Stranger: Anxiety, Comfort, and Play in Public Places. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '04*, pages 223–230, New York, NY, USA, 2004. ACM.
- [263] Firaz Peer and Carl DiSalvo. Workshops as boundary objects for data infrastructure literacy and design. In *Proceedings of the 2019 on Designing Interactive Systems Conference, DIS '19*, page 1363–1375, New York, NY, USA, 2019. Association for Computing Machinery.
- [264] Robert Perks and Alistair Thomson. *The oral history reader*. Routledge, New York, NY, 2015.
- [265] Anne Phillips. Dealing with Difference: A Politics of Ideas, or a Politics of Presence? In Seyla Benhabib, editor, *Democracy and Difference*, pages 348–359. Princeton University Press, Princeton, N.J, July 1996.
- [266] Cassandra Phoenix and Noreen Orr. Analysing exceptions within qualitative data: promoting analytical diversity to advance knowledge

- of ageing and physical activity. *Qualitative Research in Sport, Exercise and Health*, 9(3):271–284, January 2017.
- [267] Anna Pichelstorfer. Thematic Review of Annemarie Mol's The Logic of Care and Care in Practice. *Culture Unbound*, 4(2012):533–535, 2012.
- [268] James Pierce. Undesigning technology: considering the negation of design by design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '12*, pages 957–966, New York, NY, USA, May 2012. Association for Computing Machinery.
- [269] James Pierce, Phoebe Sengers, Tad Hirsch, Tom Jenkins, William Gaver, and Carl DiSalvo. Expanding and Refining Design and Criticality in HCI. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems, CHI '15*, pages 2083–2092, New York, NY, USA, 2015. ACM.
- [270] Paola Pierri. Participatory Design Practices in Mental Health in the UK: Rebutting the Optimism. *Design Issues*, 34(4):25–36, September 2018.
- [271] Foster Provost. *Data science for business*. O'Reilly, Sebastopol, Calif, 2013.
- [272] Maria Puig de la Bellacasa. Matters of Care in Technoscience: Assembling Neglected Things. *Social Studies of Science*, 41(1):85–106, February 2011.
- [273] Maria Puig de la Bellacasa. 'Nothing Comes Without Its World': Thinking with Care. *The Sociological Review*, 60(2):197–216, May 2012.
- [274] Maria Puig de la Bellacasa. Making Time for Soil: Technoscientific Futurity and the Pace of Care. *Social Studies of Science*, 45(5):691–716, October 2015.
- [275] Maria Puig de la Bellacasa. *Matters of Care: Speculative Ethics in More than Human Worlds*. University of Minnesota Press, Minneapolis, 2017.
- [276] Errol Putman and Katie Rommel-Esham. Using oral history to study change: An integrated approach. *Social Studies*, 95(5):201, 2004.
- [277] Steen Rasmussen. *Experiencing architecture*. M.I.T. Press, Massachusetts Institute of Technology, Cambridge, 1962.

- [278] Matt Ratto. Critical Making: Conceptual and Material Studies in Technology and Social Life. *The Information Society*, 27(4):252–260, July 2011.
- [279] Matt Ratto. Not Just Guns but Bullets, Too: “Deconstructive” and “Constructive” Making within the Digital Humanities. In Matthew K. Gold and Lauren F. Klein, editors, *Debates in the Digital Humanities 2019*, pages 307–318. University of Minnesota Press, 2019.
- [280] John Rawls. Political liberalism: Reply to habermas. *The Journal of Philosophy*, 92(3):132, March 1995.
- [281] Dan Richard, Cheryl Keen, Julie A. Hatcher, and Heather A. Pease. Pathways to Adult Civic Engagement: Benefits of Reflection and Dialogue across Difference in Higher Education Service-Learning Programs. *Michigan Journal of Community Service Learning*, 23(1), 2016.
- [282] Janet C. Richards. Transformations in Graduate Education Majors’ Relational Care in a Service-Learning Writing Course. *Reading Improvement*, 54.3:112, 2017.
- [283] Mohammad Rashidujjaman Rifat, Hasan Mahmud Prottoy, and Syed Ishtiaque Ahmed. The Breaking Hand: Skills, Care, and Sufferings of the Hands of an Electronic Waste Worker in Bangladesh. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, CHI ’19, page 1–14, New York, NY, USA, May 2019. Association for Computing Machinery.
- [284] Julia Ringler and Holger Reckter. DESU 100: about the temptation to destroy a robot. In *Proceedings of the Sixth International Conference on Tangible, Embedded and Embodied Interaction*, TEI ’12, pages 151–152, New York, NY, USA, February 2012. Association for Computing Machinery.
- [285] Donald Ritchie. *Doing oral history : a practical guide*. Oxford University Press, Oxford, 2003.
- [286] Donald Ritchie. *Doing oral history*. Oxford University Press, New York, NY, 2015.
- [287] Toni Robertson and Ina Wagner. Ethics: Engagement, Representation and Politics-in-Action. In Jesper Simonsen and Toni Robertson, editors, *Routledge Handbook of Participatory Design*. Taylor and Francis, Hoboken, 2012.

- [288] Tony Robinson. Service Learning as Justice Advocacy: Can Political Scientists Do Politics? *PS: Political Science and Politics*, 33(3):605–612, 2000.
- [289] Jennifer A. Rode. Reflexivity in Digital Anthropology. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '11, pages 123–132, New York, NY, USA, 2011. ACM.
- [290] Richard Rogers. Coding and Writing Analytic Memos on Qualitative Data: A Review of Johnny Saldana's The Coding Manual for Qualitative Researchers. *The Qualitative Report*, 23(4):889–893, April 2018. Publisher: Nova Southeastern University, Inc.
- [291] Daniela K. Rosner, Miwa Ikemiya, Diana Kim, and Kristin Koch. Designing with traces. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '13, pages 1649–1658, New York, NY, USA, April 2013. Association for Computing Machinery.
- [292] Daniela K. Rosner, Saba Kawas, Wenqi Li, Nicole Tilly, and Yi-Chen Sung. Out of time, out of place: Reflections on design workshops as a research method. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work; Social Computing, CSCW '16*, page 1131–1141, New York, NY, USA, 2016. Association for Computing Machinery.
- [293] Joshua Kahn Russell. Blockade. In Andrew Boyd, editor, *Beautiful Trouble: A Toolbox for Revolution*, pages 14–17. OR Books, NY, USA, 2012.
- [294] Dina Sabie, Samar Sabie, and Syed Ishtiaque Ahmed. Memory through Design: Supporting Cultural Identity for Immigrants through a Paper-Based Home Drafting Tool. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, CHI '20, pages 1–16, New York, NY, USA, April 2020. Association for Computing Machinery.
- [295] Dina Sabie, Samar Sabie, Cansu E. Dedeoglu, Yasaman Rohanifar, Fatma Hashim, Steve Easterbrook, and Syed Ishtiaque Ahmed. Exile Within Borders: Understanding the Limits of the Internally Displaced People (IDPs) in Iraq. In *Proceedings of the Fifth Workshop on Computing within Limits, LIMITS '19*, pages 1–16, New York, NY, USA, June 2019. Association for Computing Machinery.
- [296] Samar Sabie. *The Curated Use of Technology in Context-Sensitive Design*, 2017.

- [297] Samar Sabie. Hijabies, Proxies, and Difference. In *Islamic HCI Workshop, 2020 CHI Conference on Human Factors in Computing Systems*, pages 1–7, 2020.
- [298] Samar Sabie, Jay Chen, Azza Abouzied, Fatma Hashim, Harleen Kahlon, and Steve Easterbrook. Shelter Dynamics in Refugee and IDP Camps: Customization, Permanency, and Opportunities. In *Proceedings of the 2017 Workshop on Computing Within Limits, LIMITS '17*, pages 11–20, New York, NY, USA, 2017. ACM.
- [299] Samar Sabie, Steven J. Jackson, Wendy Ju, and Tapan Parikh. Unmaking as Agonism: Using Participatory Design with Youth to Surface Difference in an Intergenerational Urban Context. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*, pages 1–16, New York, NY, USA, April 2022. Association for Computing Machinery.
- [300] Samar Sabie and Tapan Parikh. Cultivating Care Through Ambiguity: Lessons from a Service Learning Course. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, CHI '19*, pages 277:1–277:14, New York, NY, USA, 2019. ACM.
- [301] Samar Sabie, Katherine Song, Tapan Parikh, Steven J. Jackson, Eric Paulos, Kristina Lindström, Åsa Ståhl, Dina Sabie, Kristina Andersen, and Ron Wakkary. Unmaking@CHI: Concretizing the material and epistemological practices of unmaking in hci. In *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems, CHI EA '22*, New York, NY, USA, May 2022. Association for Computing Machinery.
- [302] Johnny Saldana. *Fundamentals of qualitative research*. Understanding Qualitative Research. Oxford University Press, New York, NY, March 2011.
- [303] Johnny Saldana. *The Coding Manual for Qualitative Researchers*. Sage Publications, Los Angeles ; London, 3rd edition edition, December 2015.
- [304] Robert J. Sampson, Jeffrey D. Morenoff, and Felton Earls. Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children. *American Sociological Review*, 64(5):633–660, 1999.
- [305] Christian Sandvig, Kevin Hamilton, Karrie Karahalios, and Cedric Langbort. Auditing Algorithms: Research Methods for Detecting Discrimination on Internet Platforms. *Data and discrimination: converting critical concerns into productive inquiry*, pages 1–23, May 2014.

- [306] Mahua Sarkar. *Visible Histories, Disappearing Women*. Duke University Press, Durham, USA, 2008.
- [307] Mahua Sarkar. Between craft and method: Meaning and inter-subjectivity in oral history analysis. *Journal of Historical Sociology*, 25(4):578–600, November 2012.
- [308] Corina Sas, Steve Whittaker, and John Zimmerman. Design for Rituals of Letting Go: An Embodiment Perspective on Disposal Practices Informed by Grief Therapy. *ACM Transactions on Computer-Human Interaction*, 23(4):21:1–21:37, August 2016.
- [309] Elaine Scarry. *The Body in Pain: The Making and Unmaking of the World*. Oxford University Press, New York, NY, April 1987.
- [310] Bill Schechter. *Bringing history home : a classroom teacher's quest to make the past matter*. Rowman & Littlefield, Lanham, 2018.
- [311] Lynda H. Schneekloth. Uredeemably Utopian: Architecture and Making/Unmaking the World. *Utopian Studies*, 9(1):1–25, 1998.
- [312] Alexandra Schofield. Transcripts word frequency tool, 2018.
- [313] Joseph A. Schumpeter. *Capitalism, Socialism, and Democracy: Third Edition*. Harper Perennial Modern Classics, New York, 3 edition edition, November 2008.
- [314] Geoffrey Scott. *The architecture of humanism : a study in the history of taste*. W.W. Norton & Company, New York, 1999.
- [315] Elad Segev. *Semantic network analysis in social sciences*. Routledge, London, 2022.
- [316] Andrew D. Selbst and Solon Barocas. The Intuitive Appeal of Explainable Machines. *Fordham Law Review*, 87(3):1085–1139, December 2018.
- [317] Phoebe Sengers, Kirsten Boehner, Shay David, and Joseph 'Jofish' Kaye. Reflective design. In *Proceedings of the 4th decennial conference on Critical computing: between sense and sensibility*, CC '05, pages 49–58, Aarhus, Denmark, August 2005. Association for Computing Machinery.

- [318] Richard Sennett. *The conscience of the eye: the design and social life of cities*. Knopf : Distributed by Random House, New York, 1st ed edition, 1990.
- [319] Richard Sennett. *The Conscience of the Eye: The Design and Social Life of Cities*. W. W. Norton & Company, New York, NY, revised ed. edition edition, August 1992.
- [320] Richard Sennett. *Building and Dwelling: Ethics for the City*. Farrar, Straus and Giroux, New York, April 2018.
- [321] Mark Shepard. Ad-hoc network travel mug, 2009.
- [322] Mark Shepard. Ccd-me-not umbrella, 2009.
- [323] Linda Shopes. Oral history and the study of communities: Problems, paradoxes, and possibilities. *The Journal of American History*, 89(2):588–598, 2002.
- [324] Georg Simmel. Two Essays. *The Hudson Review*, 11(3):371–385, 1958.
- [325] Georg Simmel. *Georg Simmel on Individuality and Social Forms*. University of Chicago Press, Chicago, 1 edition edition, February 1972.
- [326] Herbert Simon. *The sciences of the artificial*. MIT Press, Cambridge, Mass, 1996.
- [327] T. Sitton, G.L. Mehaffy, and O.L. Davis. *Oral History: A Guide for Teachers (and Others)*. University of Texas Press, Austin, Texas, 1983.
- [328] Daniel Smith and John Protevi. Gilles Deleuze. In Edward N. Zalta, editor, *The Stanford Encyclopedia of Philosophy*. Metaphysics Research Lab, Stanford University, Spring 2020 edition, 2020.
- [329] Rachel Charlotte Smith and Ole Sejer Iversen. Participatory design for sustainable social change. *Design Studies*, 59(Special Issue on Participatory Design):9–36, July 2018.
- [330] Robert Soden, Perrine Hamel, David Lallemand, and James Pierce. *The Disaster and Climate Change Artathon: Staging Art/Science Collaborations in Crisis Informatics*, page 1273–1286. Association for Computing Machinery, New York, NY, USA, 2020.

- [331] Robert Soden, Michael Skirpan, Casey Fiesler, Zahra Ashktorab, Eric P. S. Baumer, Mark Blythe, and Jasmine Jones. CHI4EVIL: Creative Speculation on the Negative Impacts of HCI Research. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*, CHI EA '19, pages W29:1–W29:8, New York, NY, USA, 2019. ACM.
- [332] Mahmoud Soliman, Laura Sulin, and Ecem Karlıdağ-Dennis. Building capabilities of youth through participatory oral history project: The south hebron hills, a palestinian case study. *Journal of Human Development and Capabilities*, 0(0):1–20, 2022.
- [333] Katherine W Song and Eric Paulos. Unmaking: Enabling and celebrating the creative material of failure, destruction, decay, and deformation. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, New York, NY, USA, 2021. Association for Computing Machinery.
- [334] Susan Leigh Star and Karen Ruhleder. Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces. *Information Systems Research*, 7(1):111–134, March 1996.
- [335] Isabelle Stengers. Reclaiming Animism. *e-flux*, 36(July 2012):1–10, July 2012.
- [336] Laura M. Stough and Sungyoon Lee. Grounded theory approaches used in educational research journals. *International Journal of Qualitative Methods*, 20:160940692110522, January 2021.
- [337] Piet Strydom. *Contemporary critical theory and methodology*. Social Research Today. Routledge, London, England, January 2011.
- [338] Penny Summerfield. Culture and composure: Creating narratives of the gendered self in oral history interviews. *Cultural and Social History*, 1(1):65–93, 2004.
- [339] Joshua G. Tanenbaum, Amanda M. Williams, Audrey Desjardins, and Karen Tanenbaum. Democratizing Technology: Pleasure, Utility and Expressiveness in DIY and Maker Practice. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '13, pages 2603–2612, New York, NY, USA, 2013. ACM.
- [340] Alex S. Taylor. Out there. In *Proceedings of the SIGCHI Conference on Human*

Factors in Computing Systems, pages 685–694. Association for Computing Machinery, New York, NY, USA, May 2011.

- [341] Mark Tebeau. Listening to the city: Oral history and place in the digital era. *The Oral History Review*, 40(1):25–35, 2013.
- [342] Mamello Thinyane, Karthik Bhat, Lauri Goldkind, and Vikram Kamath Cannanure. Critical participatory design: reflections on engagement and empowerment in a case of a community based organization. In *Proceedings of the 15th Participatory Design Conference: Full Papers - Volume 1*, PDC '18, pages 1–10, New York, NY, USA, August 2018. Association for Computing Machinery.
- [343] Paul Thompson. *The voice of the past : oral history*. Oxford University Press, Oxford, 2000.
- [344] Alistair Thomson. Fifty years on: An international perspective on oral history. *The Journal of American History*, 85(2):581–595, 1998.
- [345] Matt Tierney. *Dismantlings: Words against Machines in the American Long Seventies*. Cornell University Press, 2019.
- [346] Charles Tilly. *Contention and Democracy in Europe, 1650-2000*. Cambridge University Press, Cambridge, illustrated edition edition, November 2003.
- [347] Cameron Tonkinwise. Design Away: Unmaking Things. *Academia*, 2013.
- [348] Austin L. Toombs. Hackerspace Tropes, Identities, and Community Values. In *Proceedings of the 2017 Conference on Designing Interactive Systems*, DIS '17, pages 1079–1091, New York, NY, USA, 2017. ACM.
- [349] Austin L. Toombs, Shaowen Bardzell, and Jeffrey Bardzell. The Proper Care and Feeding of Hackerspaces: Care Ethics and Cultures of Making. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, CHI '15, pages 629–638, New York, NY, USA, 2015. ACM.
- [350] Wolfhart Totschnig. Arendt's Notion of Natality. An Attempt at Clarification. *Ideas y Valores*, 66(165), September 2017.
- [351] Jasper Tran O'Leary, Sara Zewde, Jennifer Mankoff, and Daniela K. Rosner. Who Gets to Future?: Race, Representation, and Design Methods

- in Africatown. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, CHI '19, pages 561:1–561:13, New York, NY, USA, 2019. ACM.
- [352] Vasiliki Tsaknaki and Ylva Fernaeus. Expanding on Wabi-Sabi as a Design Resource in HCI. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, pages 5970–5983, San Jose California USA, May 2016. ACM.
- [353] Werner Ulrich. *Critical Heuristics of Social Planning: A New Approach to Practical Philosophy*. Wiley, Chichester, 1st edition edition, July 1995.
- [354] Utrecht University. Utrecht university.
- [355] David Vader. The Collaborator. In Brian A. Nejme, editor, *Service-Learning in the Computer and Information Sciences: Practical Applications in Engineering Education*, pages 77–116. Wiley-IEEE Press, 2012.
- [356] Sepehr Vakil. Ethics, Identity, and Political Vision: Toward a Justice-Centered Approach to Equity in Computer Science Education. *Harvard Educational Review*, 88(1):26–52, March 2018.
- [357] Sepehr Vakil and Maxine McKinney de Royston. Exploring Politicized Trust in a Racially Diverse Computer Science Classroom. *Race Ethnicity and Education*, 22(4):545–567, July 2019.
- [358] Sarah Van Wart, Kathryn Lanouette, and Tapan S. Parikh. Scripts and Counterscripts in Community-Based Data Science: Participatory Digital Mapping and the Pursuit of a Third Space. *Journal of the Learning Sciences*, 29(1):127–153, January 2020.
- [359] Sarah Jane Van Wart. In search of a “fair explanation”: Helping young people to consider the possibilities, limitations, and risks of computer- and data-mediated systems, 2019.
- [360] Peter-Paul Verbeek. COVER STORY Beyond interaction. *Interactions*, 22(3):26–31, April 2015.
- [361] Peter J Verovšek. Taking back control over markets: Jürgen habermas on the colonization of politics by economics. *Political Studies*, pages 1–20, June 2021.

- [362] John Vines. Playing with Provocations. In Mark Blythe and Andrew Monk, editors, *Funology 2: From Usability to Enjoyment*, pages 111–128. Springer, Cham, 2 edition, July 2018.
- [363] Shirin Vossoughi, Paula K. Hooper, and Meg Escudé. Making Through the Lens of Culture and Power: Toward Transformative Visions for Educational Equity. *Harvard Educational Review; Cambridge*, 86(2):206–232,307–309, 2016.
- [364] Ron Wakkary. *Things We Could Design*. MIT Press, 08 2021.
- [365] Tom Warren. Microsoft bids farewell to Windows 7 and the millions of PCs that still run it, January 2020.
- [366] Marie Watkins and Linda Braun. *Service-Learning from Classroom to Community to Career*. JIST Publishing, Inc, Indianapolis, USA, 2005.
- [367] Guy Watson and Jane Baxter. *Riverford Farm Recipe Book*. Fourth Estate, London, 2008.
- [368] Rachel Weber. Extracting Value from the City: Neoliberalism and Urban Redevelopment. In Neil Brenner and Nik Theodore, editors, *Spaces of Neoliberalism*, pages 172–193. John Wiley & Sons, Ltd, Hoboken, NJ, 2012.
- [369] Ai Weiwei. Dropping a Han dynasty urn 1995. In Hung Wu and Christopher Phillips, editors, *Life and dreams: contemporary Chinese photography and media art*, pages 88–91. Steidl, Göttingen, Germany, January 2018.
- [370] Ai Weiwei. Dropping a Han dynasty urn 1995. In Christopher Phillips and Hung Wu, editors, *Life and dreams: contemporary Chinese photography and media art*, pages 88–91. Steidl, Göttingen, 2018.
- [371] Bernard Williams. *Problems of the Self*. Cambridge University Press, Cambridge, June 1973.
- [372] Daniel Willis. Review of On Weathering: The Life of Buildings in Time. *Journal of Architectural Education (1984-)*, 48(2):126–129, 1994.
- [373] Alisha R. Winn. The remembering st. petersburg oral history project: Youth empowerment and heritage preservation through a community museum. *Transforming Anthropology*, 20(1):67–78, March 2012.

- [374] Langdon Winner. Do artifacts have politics? *Daedalus*, 109(1):121–136, 1980.
- [375] Kurt H. Wolff. *The Sociology of Georg Simmel*. Simon & Schuster, New York, June 1985.
- [376] Sheldon S. Wolin. Fugitive Democracy. In Seyla Benhabib, editor, *Democracy and Difference: Contesting the Boundaries of the Political*, pages 31–45. Princeton University Press, Princeton, N.J, July 1996.
- [377] Marisol Wong-Villacres, Cristina M. Velasquez, and Neha Kumar. Social Media for Earthquake Response: Unpacking Its Limitations with Care. *Proc. ACM Hum.-Comput. Interact.*, 1(CSCW):112:1–112:22, December 2017.
- [378] Margaret Wood. *The Stranger a Study in Social Relationships*. Columbia University Press, New York, NY, 1934.
- [379] Phil Wood and Charles Landry. *The intercultural city: planning for diversity advantage*. Earthscan, London ; Sterling, VA, 2008.
- [380] Nicholas Woolf. *Qualitative analysis using ATLAS.ti : the five-level QDA method*. Routledge, New York, NY, 2018.
- [381] Frank Lloyd Wright. *The Natural House*. Horizon Pr, New York, March 1954.
- [382] Shanel Wu and Laura Devendorf. Unfabricate: Designing Smart Textiles for Disassembly. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, CHI '20*, page 1–14, New York, NY, USA, April 2020. Association for Computing Machinery.
- [383] Tara Yosso. *Critical Race Counterstories along the Chicana/Chicano Educational Pipeline*. Routledge, New York, 1 edition edition, November 2005.
- [384] Iris Marion Young. Communication and the Other: Beyond Deliberative Democracy. In Seyla Benhabib, editor, *Democracy and Difference: Contesting the Boundaries of the Political*, pages 120–134. Princeton University Press, Princeton, NJ, July 1996.
- [385] Jonathan F. Zaff, Oksana Malanchuk, and Jacquelynn S. Eccles.

Predicting Positive Citizenship from Adolescence to Young Adulthood: The Effects of a Civic Context. *Applied developmental science*, 12(8):38–53, 2008.

- [386] Lili Zarzycki. Revaluing emptiness in Chicago, June 2021.
- [387] Ellen Zegura, Carl DiSalvo, and Amanda Meng. Care and the Practice of Data Science for Social Good. In *Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies, COMPASS '18*, pages Article 34 (June 2018), 9 pages, New York, NY, USA, 2018. ACM.
- [388] Andrzej Zieleniec. The right to write the city: Lefebvre and graffiti. *Environnement Urbain / Urban Environment*, 10:1–20, September 2016.
- [389] John Zimmerman, Jodi Forlizzi, and Shelley Evenson. Research through design as a method for interaction design research in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '07*, pages 493–502, New York, NY, USA, April 2007. Association for Computing Machinery.
- [390] Amit Zoran and Leah Buechley. Hybrid Reassemblage: An Exploration of Craft, Digital Fabrication and Artifact Uniqueness. *Leonardo*, 46(1):4–10, February 2013.