

Engaging with Public Art

An Exploration of the Design Space

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ABSTRACT

At its best, public art can promote moral learning in individuals and societies, and digital technology can help achieve this value. As a first step in creating such systems, this paper presents a probe study exploring the design space of reflective engagement with public art. The probe took the form of a mural journal, which was distributed to participants in Philadelphia. The findings show how public art journaling can be integrated into one's life, both logistically and psychologically, and the value of art journaling for introspection, cultivating attention and having fun. This study surfaces a number of tensions in the design space that designers must navigate, such as the question of reflecting with public art on site (now) versus at home (later). This work provides designers with the grounds for informed inspiration to ideate systems that deepen people's experiences with public art.

Author Keywords

design probe, public art, moral learning, reflection

CCS Concepts

•**Human-centered computing** → **HCI design and evaluation methods; Interaction design process and methods; Empirical studies in HCI;**

INTRODUCTION

We tend to think of art simply as decoration. As Wittgenstein wrote, "People nowadays think that scientists exist to instruct them; poets, musicians, etc. to give them pleasure. The idea that *these have something to teach them*—that does not occur to them" [107]. We can indeed learn from art, but it's not *facts* we learn; rather, art gives us knowledge of how to be and act to live the best life we can, what philosophers have called moral knowledge [108]. Here *moral*, perhaps a loaded term, refers to right conduct, what people feel they ought or ought not to do, which is separate from the question of what is ultimately right or wrong [86]. A distinction of public art is that it stimulates

moral learning among communities and not just individuals [33]. Such learning is the real value of public art, but it is not automatic; rather, it must be encouraged and supported. Digital technology may be one path for doing so.

As a first step toward creating systems to help realize the moral value of public art, this paper presents a design probe study exploring the design space at the juncture of public art and moral learning. Here *design space* refers to a curated set of concepts in a metaphorical space of opportunity [38]. As a design probe study, this work is meant to create understandings of users' values and expectations [103] as well as the constraints [25] in this space. Thus, the key contribution of this paper is to provide designers with grounds for informed inspiration to ideate systems for meaningful engagement with public art. The findings show how public art journaling can be gainfully integrated into one's life. This study also surfaces a number of tensions in the design space, such as the prospect of sharing ineffable experiences, and it discusses strategies for navigating those tensions.

The next section provides background on how art, and public art particularly, contributes to moral learning. Following that, work in HCI on art engagement is reviewed. Most of this work deals with delivering information *about* art rather than engaging experiences *with* art. Thus, work on HCI for reflection is also reviewed. Next, the probe study is presented and discussed, followed by a reflection on the meaning of these results for designers in this space.

BACKGROUND

Art, Knowledge and Technology

Technology is often assumed to be "anything invented after you were born," as Alan Kay quipped. While tongue-in-cheek, that remark captures the reality that our default view of technology is too narrow, and consequently our sense of the possible for our digital future has been overly constrained.

So what *is* technology? At heart, technology is about knowledge and action. It is instructive to return to Ancient Greek thought, in which there was no clean distinction between "knowing" and "doing." Rather, there were three interrelated concepts at this nexus: *episteme* (knowledge); *techne* (procedure); and *poiesis* (bringing forth) [49]. Technology, even today, includes all three. This is often ignored, however, in part because the word *technology* only makes reference to

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techné. But seeing technology as merely *technical* means construing things only for their instrumental value and tending to amass them as a form of control [49]. To avoid this danger, we should must remember the *poetic* aspect of technology [48, 49]. One way to do so is to take art (which is often construed as *only* poetic) seriously as technology.

As a form of technology, art contributes to knowledge production by exemplifying aspects of the world that would otherwise go overlooked and inviting novel juxtapositions, thus exposing and even challenging societal assumptions [14, 23, 28]. Art contributes to *moral knowledge*, or that pertaining to how one should act to live the best life they can, what Aristotle referred to as “the good life” [56, 108]. This is related to *moral imagination*, the concepts and scenarios that one can mentally inhabit, helping them become a more ethical actor in difficult real-life situations [57, 60, 61, 81].

Just as the technical and epistemic aspects of art are often ignored, so is the poetic aspect of other technologies. To be sure, some work in HCI has begun to examine the poetic [3, 27, 55, 58, 69]; this paper serves as a call for more work in this area. Considering the technicity of art and the poetry of technology may lead to new insights for design and research at the intersection of art and digital technology.

Defining Public Art

Within the domain of art, this paper deals specifically with *public* art. Public art includes murals, statues, landscapes, happenings and more; it is defined not by its size or material, but its location. In short, public art has been defined as art that is freely accessible to a community [33, 21].¹

Early public art was often propagandistic, representing only dominant viewpoints; but nowadays public art often deliberately invites controversy [62]. At its best, “public art can express community values . . . heighten our awareness, or question our assumptions” [33]. Public art, then, is particularly important for fostering moral knowledge and imagination. In this way, the ethics of public art appeal to the good *society*, rather than just the good *life* [13].

However, the development of moral knowledge and imagination (henceforth “moral learning”) is not a given. Often, public art simply fades into the background in the hurly-burly of daily life. There may be an opportunity for digital technology to help realize public art’s potential for more people. This paper presents an initial move in that direction.

RELATED WORK

Two research areas frame the study at hand: art engagement; and sociotechnical design for personal reflection.

HCI for Art Engagement

Most of the HCI work on art engagement has been in the museum context [51]. Researchers have investigated the possibilities of digital mediators and interactive installations [2,

¹What “accessible” means here is unclear, which is perhaps more evident to scholars in HCI than those in other fields, with HCI’s longtime interest in problematizing and championing accessibility. There is conceptual work to be done examining the ways in which public art is accessible—how, when, and to whom.

16], the design of mobile devices for use within galleries [26, 36, 79, 84, 95, 99], and how museum visitors share their experiences on social media during and after their visits [88, 105]. Another line of research examines the use of mobile technology for museal outdoor experiences [19, 31, 47, 72]. Most of this work has focused on content delivery, such as information about museum objects, which is not directly relevant to the present study. However, some has explored other dimensions of museum experience, such as how visitors become inspired [79] and how visitors connect museum experiences to their lives and selves through social curation [105] and gifting [95]. This work shows that, when an exhibit or object resonates with someone, they may use multiple interactive systems to interpret and continue to define their experience. In this way, visitors bring their experiences home with them, blurring the boundary between museum and world. Moreover, it may be possible for design to stimulate such resonance and inspiration.

There has also been some work in HCI on public art. The bulk of this work explores technical issues such as utilizing digital technology in installations [9, 93], including how digital technology can be used in the collaborative creation of public art [18, 35, 54, 66]. Some work also provides ways for people to engage with images of public art on the web [75, 100]. Just as with the museum context, there has also been work examining how digital technology, such as augmented reality, can mediate experiences with public art [22, 90, 104]. Of particular relevance for the present paper, Wallace et al. [104] show how a public art installation in a hospital can help people with dementia undergo moral learning.

Overall, this work has explored the social aspects of art experiences and related short-term uses of technology, leaving mostly unexplored the role of technology in private art experiences and over the long term. Still, some findings [79, 104] suggest that this would be a fruitful path to explore, a prospect also supported by work on designing for experience, meaning, self, etc. [63, 71, 73, 109].

Design for Reflection

Another body of research in HCI deals with moral learning without making direct reference to art. This work is broadly part of the Slow Technology movement. Slow Technology defies the inclination to design for speed and convenience, instead seeking to encourage introspection and mindful attentiveness [44, 46]. HCI designs in this space often invoke the concept of *reflection* [7, 32, 40, 76, 82]. In psychology, reflection has been much studied and is understood to be a crucial part of learning and mental health [7, 12, 96]. But many people do not reflect on their own, and must be given a reason and encouragement to do so [32, 89].

The concept of reflection is often left undefined [7, 32], but there have been some theoretical discussions. [7] describes reflection on three dimensions: (1) *breakdown*, where an unexpected situation makes the implicit become explicit; (2) *inquiry*, where people examine their knowledge and the origins thereof; and (3) *transformation*, where a person gains a new conceptualization of a situation. Next, [32] offer axioms for designing for reflection in HCI: First, one’s purpose influences the nature of reflection. Next, reflection requires

time, guidance and encouragement. And finally, reflection can vary in depth: *revisiting* (R0), *explaining* (R1), *exploring relationships* (R2), *undergoing fundamental change* (R3), and *grasping implications* (R4).

On this view, technology can support reflection in numerous ways. First, a technology can provide a purpose to reflect or respond to a particular extant purpose in a person's life; different purposes require different sorts of reflection [32, 89]. Second, a technology can provide a person with the requisite conditions for reflection, such as by engaging a person in dialogue, supporting inquiry, providing contextual or guiding information, and offering a platform for expression [7, 76, 89]. Third, a technology can support reflection at different levels. For instance, to support R1 reflection, a system may prompt a person with questions, while for R2, it may provide extrasensory information [32]. Last, technology can assist with different stages of reflection, e.g., by providing triggers for reflection, supporting in-progress reflection, and capturing externalized reflections [76, 89], as well as different dimensions of reflection (e.g., breakdown) [7].

In sum, this work suggests that designs should allow open, holistic reflection, integrating different technologies and aspects of one's life and broader context [7, 32, 76, 89].

FRAMEWORK AND RESEARCH QUESTIONS

From the discussion so far, the following theoretical framework emerges. Art is valuable not only as decoration but for its role in moral learning, i.e., helping people move toward the good life. *Public* art is particularly valuable for helping communities move toward the good society. This may be the case even when considering individual art experiences, as societal change in some respects "bubbles up" from individual art experiences [53]. Moral learning requires reflection, which is not a given, but which can be encouraged through technology. Reflective journaling is one effective modality for moral learning [30, 96], and it has been explored to some extent in HCI already [24, 29, 68].

There is an opportunity to connect the work on reflective journaling with that on art engagement and moral learning. Moreover, the unique possibilities of digital technology may engender new modalities for reflective art engagement. This would constitute theoretical and practical advances in HCI, and it would also better demonstrate the value of public art, which is notoriously difficult to assess [45].

This framework precipitates two research questions, which the present paper responds to: (RQ1) *How might people use journaling as part of their experience of public art?* (RQ2) *What are the features of this design space?* These are exploratory questions, situated early in the design process. They were addressed with a design probe study, as described below.

DESIGN PROBE STUDY

The design probe is a design-led, user-as-subject methodology for generating insights and inspiration about a design space [91, 110]. Broadly speaking, it is a type of diary study, a longitudinal, qualitative research approach in which participants self-report in a log or journal [106]. In the case of design

probes, the "diary" is comprised of small, crafted objects that "pos[e] a question through gentle, provocative, creative means offering a participant intriguing ways to consider a question and form a response ... creatively" [103].

Since the introduction of cultural probes in 1999 [37], the design probe approach has been much discussed and refined [39, 43, 70, 92, 103]. This has borne a suite of related techniques, including technology probes [52]. The term "design probe" can be used as an umbrella term for cultural probes, technology probes and similar approaches [103].

Design probes are appropriate for exploring phenomena that take place intermittently or are difficult to observe directly. Probes can accommodate a range of exploratory questions, including understanding a culture (as in cultural probes) and understanding people's orientations toward a technology (technology probes). Probe studies are not meant to "produce comprehensible results [or] requirements analyses" [39]. Rather, probes are valuable for reimagining the designer-user relationship and subverting the tradition of usability engineering. Probes spark inspiration for designers, but they also enrich the design process itself [103].

Setting

This study was set in Philadelphia, which is an ideal location for public art-related research. A major American city of 1.6 million, Philadelphia is home to the Association for Public Art (APA) and is known as the "City of Murals"—it has an estimated 4,000 murals, to say nothing of other public art.

In fact, the U.S. public art movement began in Philadelphia. It blossomed in the aftermath of the American Revolution, when art was used to symbolize and stimulate American unity and spirit. Philadelphia saw its first monumental commissions in 1792, but many locate the birth of U.S. public art in 1872, when William Rush was contracted to design a fountain for the Benjamin Franklin Parkway, a popular promenade. From the start, public art was controversial: The scant clothing of Rush's marble nymphs incited a scandal. Over the decades, it became clear that improving public spaces with art also improved the citizenry. The success of public art in Philadelphia set the stage for the first nationwide public art programs in 1934 as part of the New Deal [6, 62].

Philadelphia has continued to innovate in public art. In 1959, the city enacted the first Percent for Art program in the country. In such programs, one percent of the cost of any city improvement is allocated for artwork [5]. Then, 1984 saw the birth of the Mural Arts Program (MAP), now the nation's largest public art program. MAP partners with community members and local organizations of all kinds to "transform places, individuals, communities and institutions" through a process that "empowers artists to be change agents, stimulates dialogue about critical issues, and builds bridges of connection and understanding" [78]. Since its origin, MAP has notably played a therapeutic and rehabilitative role for local inmates [41, 42]. As such, MAP is a locus for art education, restorative justice and stimulating the creative economy. The program has been hugely successful, lauded in the public sphere as well as academe [97], and it has been adapted in other cities [4]. In

particular, MAP is noted for how it gives voice to minorities and underprivileged groups, recognizing that different people define “good” art differently [77, 101].

Though a fount of public art, Philadelphia has not seen much innovation at the crossroads of public art and digital technology. Granted, several public artworks in the city have digital components, such as Jenny Holzer’s massive display in the Comcast Technology Center. Additionally, a few digital tools have been developed for public art engagement. For example, APA sponsors *Museum Without Walls*, an audio program providing information on over 70 public artworks; and MAP offers *Mural Finder* (<https://map.muralarts.org>), a map with information about many MAP murals, though it is not exhaustive or up-to-date. Indeed, no comprehensive list exists of the murals in Philadelphia [50].

Developing the Probe

An essential part of any probe study is a description of how the probe was designed [103]. As a research tool, the probe was designed to illuminate the design space of moral learning and public art engagement. Murals were selected as a particular genre of public art to constrain the probe’s scope and because most Philadelphians are familiar with MAP.

Inspiration for this probe came several sources. First, the literature on art and moral knowledge [108] and reflective writing in psychology [96], along with MAP’s credo that “art ignites change” [78], suggested an unexplored connection between art, moral learning and journaling. Next, this project was inspired by the Slow Art movement in the museum world [87], which seeks to deepen visitors’ experiences with art. Within this movement, two methods were particularly formative: Exercises for the Quiet Eye (EQE) [98] and Visual Thinking Strategies (VTS) [102]. EQE aims to expand the art encounter; it dissuades people from trying to “figure out” what a work means and moving on too quickly [98]. VTS is a curriculum and professional development program focused on improving human relationships through art experiences [102]. On Baumer’s framework of reflection [7], both of these paradigms begin with *inquiry* and move toward *transformation*. The development of the probe followed the guidelines set forth by [103], including:

- Probes can be held, touched and added to physically.
- Probes strike a balance of openness and constraint.
- Probes are part-made; participants complete them.
- Probes are crafted but not so polished as to be alienating.

In this study, the probe took the form of a small booklet (see Figure 1). This format was selected for its familiarity in journaling. Moreover, booklets have been used successfully in prior exploratory HCI design work [17]. As described below, each page presents the participant with open-ended textual prompts. These prompts were drawn from EQE and VTS materials and adapted for the mural context. They were refined in consultation with a local museum educator.

The probe measures 4 by 6 inches, with heavyweight cream-colored pages and a blank Speckleton Kraft cardstock cover.



Figure 1. The design probe.

It was designed and typeset in-house and produced by Smartpress. The probe was designed to be portable (small enough to carry, but with enough room to write a few sentences for each question) and discreet (nothing on the cover). Instructions appear on the first page; the participant is assured that there is no “right” way to do the project and reminded that words and/or images may be used. On each of the 27 following pages, there is a space for “Date” and “Mural,” as well as two questions. The questions were designed to bring the participant from a surface-level reflection in the first question to a deeper one in the second, e.g., from *explaining* to *grasping implications* [32]. For example, one page asks, *What part of the mural is most interesting to you?* and *Does it suggest a different way of feeling?* Another page asks, *How does its location affect how you experience it?* and *What story from your past does it remind you of?* In total there are 13 first questions and 13 second questions, and they are repeated with different pairings. The full list of questions is available in the ACM Digital Library as auxiliary material.

Methods and Analysis

In this study, participants were given the probe for one month. Halfway through, they took an online survey. Afterwards, they took part in a semi-structured interview. The study ran from October 2018 to January 2019 and was approved by the Drexel University institutional review board.

The participants lived and worked in Philadelphia and commuted to their jobs. They were selected through convenience and snowball sampling. Thirteen participants—seven women and six men, ranging in age from approximately 25 to 55—were enrolled in the study. Nine completed the online survey, and six completed the follow-up interview. The participants who did not complete the interview were engaged in a short-form interview to understand why they did not use the probe. Participants were not remunerated, but they were allowed to keep the probe once the study was concluded, and they were given an extra probe as a gift.

It may be that people with background in art or design would approach this study differently than others, but this was not controlled for in the present study. Two participants (Adam and Dorothy) kept journals before participating in this study, albeit sporadically.

At the initial, individual briefing, the instructions were explained and informed consent was gathered. After two weeks, each participant was sent a link to the survey, which asked them to recount their latest experience using the probe. After

Table 1. Summary of Interviewed Participants and Completed Probes

| Pseudonym | Sex | Age (≈) | Entries | Words/Entry | Drawings? | ID Murals By | Dominant Themes |
|-----------|-----|---------|---------|-------------|-----------|-------------------------|---------------------------|
| Adam | M | 30 | 13 | 34 | No | Intersection | Memories, philosophy |
| Dorothy | F | 35 | 8 | 0 | No | Title | – |
| Mimi | F | 25 | 25 | 49 | Yes | Title + intersection | Location, insights gained |
| Nicholas | M | 35 | 22 | 32 | Yes | Title + intersection | Politics, philosophy |
| Patricia | F | 25 | 7 | 19 | No | Descrip. + intersection | Content, style |
| Ray | M | 55 | 12 | 3 | No | Neighborhood | – |

four weeks, each participant was contacted to arrange a follow-up interview of approximately 30 minutes. The interviewees shared how they used the probe, how participating changed the way they experienced murals and other parts of their life, and whether they would use the probe long term.

The interview transcripts and survey responses were analyzed through multiple rounds of open coding in NVivo, which resulted in thematic categories and dichotomies [74]. Features of the completed probes were counted to understand the range of ways the probes were used, and the contents of the probes were subjected to a separate open-coding process to ascertain the topics that came up in each probe. The interviewed participants and features of the probes are summarized in Table 1.

FINDINGS

Using the Probe

Six of the participants completed the probes and participated in the follow-up interview. “Complete” meant something different for each of these participants. Mimi and Nicholas made over 20 entries with about 40 words each, while Dorothy and Ray made few entries with minimal writing; Dorothy included only mural names, as she reflected only mentally, while Ray’s entries were very short. Of the six completed probes, only two included drawings. Nicholas drew on the front—the only person to modify the cover. All participants used one page per mural and did not visit the same mural twice. Half the participants identified murals by their official names (which is usually found at the bottom corner), while the others identified the murals by their location or description. Beyond these preliminary notes, the findings about the use of the probe can be organized into three themes, as described below.

Life Integration

The first theme discerned was Life Integration, which has two forms: logistical and psychological. Logistically, Life Integration concerns the way the participants fit the probe into their everyday lives, using it in particular ways given their daily routines, available time and use of other technologies. Psychologically, it concerns the ways in which participants connected their experiences with the probe to other aspects of their mental life, such as in bringing up memories, linking to current events in one’s life or engaging in philosophical self-reflection.

To speak first of logistical Life Integration, all the participants except Ray carried the probe on a regular basis, such as in their “work backpack.” As time allowed, they paused on their way to or from work to reflect on a mural that they passed. Sometimes having the probe changed their behavior: Some

took new routes to work or lunch to see new murals, some set aside time to go on mural hunting, and some used online tools like *Mural Finder* to plan excursions.

The participants tended to use the probe in situ, completing their reflections in the presence of the mural. Several participants expressed that they considered this the “right” way to use the probe. However, others completed their mural visits and written reflections at separate times. Ray, for instance, often visited murals while running in the city, when he didn’t have the journal with him. He took photos of the murals on his smartphone and then filled out the probe at night. In Ray’s case, this was a decision of preference; for other participants, this was sometimes necessitated by the weather or other factors (e.g., hands being full). Nicholas also took photos of each mural he wrote about; he mentioned in his interview that he planned to print out the photos and adhere them to the probe pages once the study was done. These examples show ways in which the probe was integrated with other technologies in the participants’ lives.

However, the probe was not seamlessly integrated into all the participants’ lives. One major hurdle was forgetting about it. As Adam said, “*I honestly forgot it was in my book bag for a week or so, and I was like, ‘Oh crap, I forgot about this.’*” Beyond this, some participants expressed that it was difficult to make time to complete the probe. Dorothy, a working wife and mother of two young children, exemplified this. Though she was eager to participate, “*It didn’t benefit my kids or my husband or my job, so it was not on the high end of priority. But it would have given me some good satisfaction to really immerse myself in this.*” That said, those who were able to integrate the probe into their lives found it to be rewarding—this is discussed in the next theme, Value of Art Journaling.

The second aspect of Life Integration was psychological. All the participants connected their experiences with the murals to other parts of their lives. In some cases, these were connections to specific events. Nicholas, for example, said:

Before the Philadelphia Marathon, I was down in Old City, and I wanted to see this one mural. There’s a runner, an equestrian, a cyclist and a rower, and it’s the stages of their motion. . . . I knew it was gonna be a long weekend . . . I wanted to remind myself: Just take it one stride at a time. It helped me think ahead about me running and how you have to break it down to smaller segments.

Others exhibited Life Integration on a more general level. A common theme was slowing down. Adam compared his experience living in rural and urban areas at different points in

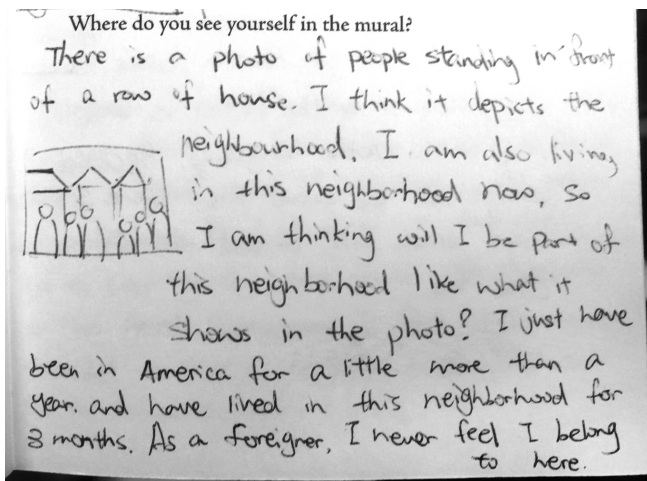


Figure 2. An example of Life Integration.

his life, saying the probe brought a slower, “rural” mindset to his life in the city. Dorothy, while discussing her challenges in making time for the probe, described this as a self-revelation: “It was one of those *aha* moments where it made me realize that I don’t sit still, and I don’t slow down well.”

Notably, in some cases this reflection was not only oriented toward the past and present, but also informed the future. For example, Mimi, a recent immigrant, reflected on how her sense of belonging in her neighborhood might change over time (Figure 2). For Adam, using the probe made him more motivated to work. As he said, “*Seeing the object of someone’s creativity made me want to be more creative myself. . . Same at work, where I felt not just more motivated but got a little more enjoyment out of some of the work that I do.*”

Value of Art Journaling

All the participants expressed that using the probe was valuable for the way it provoked introspection and slowing down—and was fun. To quote Nicholas:

My life is busier than I want most of the time, but this was something I enjoyed working into my schedule and making time for. More so than most other things. I would forgo happy hour or dinner with friends for this—I would rather make this our time to hang out. It was a lot of fun.

An important aspect of this value, it seems, was the cultivation of attention. All the participants mentioned that they noticed more murals during the study. Patricia, for example, saw ones she hadn’t seen before. She said, “*It made me realize how many murals I see on a daily basis just commuting or walking somewhere to get coffee.*” In Ray’s case, he found himself looking for murals in places he traveled, as well as paying more attention to murals that already knew about: “*Normally you just take it for granted. You look at it, you’re just like, ‘Oh, that’s cool,’ and you keep going. But now I had something to do, so you think about it a little differently. You stand there a little bit longer.*” Mimi expressed a similar sentiment, connecting this to situational awareness more broadly: “*I really had the opportunity to see what’s around me, instead of just passing by really quickly.*”

As participants used the probe for a month, they were able to begin reflecting on potential long-term changes. Nicholas remarked, “*I feel like I’m a little more introspective now. Maybe that’s just wishful thinking, but it definitely makes you think on a whole deeper level than people normally do, at least day to day.*” Thinking this way may feed forward in a virtuous cycle; as Adam put it, “*The active reflecting on the fact that I was feeling this way made me want to continue feeling that way. So I kinda drew on that feeling moving forward. I wouldn’t say it’s a permanent feeling, but I feel like it did continue beyond a moment or a day.*” When asked if they would continue using the probe, or something like it, in the long term, all but one responded that they would. Dorothy, for example, said, “*This was hard for me. And so this would be hard to work towards, and I would work towards it. I would do it to remind myself of the intentions I have to slow down and take time for myself.*” However, Mimi did express that if she were to use a mural journal in the long term, she would run out of murals. “*I used one page for each mural. I’m not sure if I used it long term if I write more. Maybe I would just write one time and then say, ‘Oh, this one I already wrote about, so I won’t write again.’*”

Usability

The third theme that emerged in the surveys and interviews was Usability. All participants found the size of the probe to strike a good balance between portability and usefulness, and its physicality was also a reminder of the participant’s task. As Dorothy said, “*I think any smaller would be hard to write much or do much with. And it’s big enough that you see it. It’s kind of an obvious, in-your-face thing, like ‘Take me with you!’*” However, some participants expressed that it was difficult to use the probe on the go. Patricia, for example, found herself unable to use the probe during her commute, as she often had her hands full. She said:

The size works but you need two hands—you need to keep it open and write on the page at the same time. If it was electronic, it would be slightly easier. . . . If it was more like a mural hunt, or I took a special trip to go see murals, the journal would be fine. But integrating it into the way I’m already living was difficult.

On that note, both Patricia and Mimi said they would have preferred a smartphone version of the probe, as it would be easier to type than to handwrite.

That said, there was some indication that making the journal much easier to use would undermine its purpose. Adam:

I think not making it as simple as possible reduced my participation at times, but then when I forced myself to actually use it how it was meant to be used, I got more enjoyment out of it. And so at first I was thinking, “Oh, you should have made it so I could do this on my phone,” cuz then I would have done it more often. But then when I started using it more often, I realized I actually enjoy this more, even though at first it kind of sucked.

Similarly, Dorothy discussed how if she could complete the probe on her smartphone, “*it would take away from experiencing art, because it makes it too easy, too programmed.*”

Tensions in the Design Space

Beyond the themes described above, the empirical material suggests a number of tensions within the design space of engagement with public art and moral learning. It may not be possible to resolve these tensions with design; rather, they are features of the design space that must be navigated.

Paper vs. Phone

As discussed above, the question of digitizing the probe came up in nearly every interview. Mimi and Patricia wanted the probe to be digital, while Adam and Dorothy preferred paper. Adam had experience using both, as sometimes he completed the probe using Google Keep:

I felt a different sort of present in writing, than typing. And it's a little bit more permanent when I write on a piece of paper than type and delete and go back and forth. . . . I'll say, I would definitely keep going with this, and I don't think I would if I was just writing in my phone.

A key dimension of the preference of paper vs. phone was facility with text entry, but this was not the only reason. Dorothy, Patricia and Ray all found that sometimes the on-page question did not apply to the mural at hand; to this end, a digital version may allow for choice among questions, or contextually-generated questions. As well, Patricia generated the idea that an app version could offer multiple forms of engagement beyond open responses, such as multiple choice, “*because even though they're suggested responses, that could still make you think of something that you didn't necessarily think of but you still thought was right.*”

All the same, a digital version would have had some drawbacks, such as visibility. As Dorothy said, “*Seeing the journal reminds me that I need to be paying attention to it. It's not my phone, because there's a million things on my phone I need to pay attention to.*” She associated the probe with unplugging and mindfulness, which she saw as opposed to digital technology. “*You're connected to technology all the time, which allows you to be in lots of places at once, and your head is in all these different places, but art requires you to just be there.*”

Easy vs. Hard

Along with the question of digitization came that of what ease-of-use should mean in this context. Adam said, “*Just making it easy changes the experience of what you're doing. So I think making it too easy changes the experience of how you appreciate art as you walk by.*” This tension is related to the issues regarding usability described above.

Now vs. Later

Another question arose regarding the temporality of art experiences and reflection. While some of the participants did their reflections in situ, others used the probe minutes or hours after encountering the mural.

There was a sense among some of the participants that reflecting in situ was the “right” way to use the probe. Still, sometimes they did otherwise, usually because their schedule allowed no time for reflection in that moment. As Patricia said, “*I found it difficult to actually reflect in the moment when I saw the mural because it was always fleeting.*” In such cases,

being able to reflect later on was helpful. Those who reflected later described trying to remember what the mural was like. In some cases, they referred to photos they had taken at the time. The tension between now and later, between in situ and using a reproduction, is exemplified by Dorothy:

I thought about taking a picture of it and using that to remind me when I had time, but I felt like that was cheating. . . . I was trying to use my organic feeling about when I saw the mural rather than what the picture showed me. . . . I don't know. That might've helped if I had taken a picture.

While these different approaches certainly produce different experiences [64, 65], both are valid experiences. *Prima facie*, it would seem that either could be conducive to moral learning, but the question of which is preferable or more effective under what circumstances is an open one.

Top Down vs. Bottom Up

The probe invited participants to engage with murals throughout Philadelphia. Predictably, this led to the question, “What counts as a mural?”—a subset of the perennial question, “What is art?” Many of the murals in Philadelphia were produced by MAP, some of which have been documented in *Mural Finder*. Other murals are produced independently by property owners hiring local artists. While MAP-produced murals are generally large and well-defined, other murals may be smaller and without clear boundaries, such as a painted flourish around a doorway. Does this count as a mural? What about street art? Graffiti?

Some of the participants limited themselves to reflecting on institutionally-defined murals with the probe, while others defined the object of the probe for themselves. Dorothy discussed how she appreciated reflections, unexpected juxtapositions and other “*neat setups*” she encountered the city, which she enjoys photographing and sharing. These participants seemed interested in using the probe to reflect on experiences with such objects. For example, Adam said:

I started thinking about different objects and people as I walked around the city, and not just the art. Then I started thinking about questions like in the booklet. . . . You know those little easels they have in the road that they use to cover up a pothole or roadwork? One had a tag on it, spray-painted, and I actually wrote about that.

This tension was also seen in participants' different approaches to naming murals. As shown in Table 1, some of the participants described the murals by neighborhood, street intersection or contents, while others recorded the official title of the mural. For MAP-sponsored murals, the title appears at eye-level, but sometimes it has worn away; independent murals rarely have written titles. Mimi in particular described the effort she took to discern each mural's official title—for example, she referred to *Mural Finder* when she could not find the title on the mural itself—expressing some annoyance in cases where the title was nowhere to be found. Thus, while some participants were interested in recording only their subjective art experiences, others did want to use the probe as a way to record factual information about the murals.

Private vs. Shared

Another tension in the design space is that between private and shared experiences. Almost all of the participants chose to use the probe on their own. Nicholas, however, used the probe with friends and even on dates. The participants' accounts suggest that meaningful experiences with the probe can be had both individually and with others.

There is a deeper tension here as well, regarding the communicability of art experiences. All but one of the participants provided textual answers, perhaps because the probe posed textual questions. But expressing an art experience in words may not always be possible. As Patricia said, "*There is something private about an art experience, which also is why it's sometimes hard to write about it. For me, sometimes it's not in words, how this thing makes me feel. And then finding words almost ruins it sometimes.*"

Planned vs. Spontaneous

Finally, there was a tension between planned and spontaneous encounters with art. In the museum setting, encounters are generally planned—i.e., museums are sites which one makes time for, pays for entry, expects to encounter art, etc. Public art, in contrast, can be encountered unexpectedly and spontaneously.

In this study, some participants sought to let their encounters happen naturally. Patricia, for example, said, "*I wanted to see what I came in contact normally, instead of making an individualized adventure out of it.*" Others planned their encounters, e.g., by using *Mural Finder* to map out routes. In contrast to some of the other tensions, participants did not express that either approach was right or wrong.

DISCUSSION

This study used a design probe to explore reflective engagement with public art, showing how participants integrated the probe into their lives in diverse ways. Participants valued this integration for the way it sharpened their attention and provoked self-reflection—despite, or perhaps because of, certain challenges and tensions in this design space.

Such tensions may be inevitable as HCI continues to expand its concerns, having broadened from a narrow interest in engineering for efficiency and productivity to questions of satisfaction, meaning, etc. [73]. The issue of ease-of-use is a particularly serious consideration when it comes to moral learning: The literature in educational psychology suggests that learning occurs in spaces of discomfort or where there is a certain measure of struggle—some, but not too much [10, 67]—and this has also been discussed in the context of moral development and the teaching of ethics [15, 83].

Evidence of Moral Learning from Two Sources

This study sought to address two research questions—the first regarding journaling in public art experiences, and the second regarding features of the design space at the nexus of public art and reflective engagement. The findings presented above offer answers to those questions. However, it is worth returning to the issue of moral learning, which forms the conceptual backdrop of this project.

Moral learning emerged in the participants' art experiences from two sources of engagement: the act of journaling, and the content of the artwork. To give two examples of the former, recall Dorothy's epiphany about the need to slow down. Another example is Adam, who found himself more energized to do creative work. For examples of the latter, we can recall Nicholas' reflection on his upcoming marathon weekend by visiting a mural depicting athletes, and Mimi's thoughts on belonging (or not) in her neighborhood.

To be sure, these are small examples of moral learning. But as a long journey can be divided into single footsteps, such small examples may build up over time into substantial moral change. There is also the question of the link between moral learning and action. As detailed above, the participants' realizations did lead to some changes over the course of the weeks in which this study took place; to be sure, the hope would be that such changes persist or evolve over time, but this is a question for further, more longitudinal, research. The connection between individual and societal moral change will require an even wider lens; but given the scope and potential of public art, such research would be well worthwhile.

Navigating the Design Space

The findings in this study show that designers in this space must grapple with many difficult questions. For example, which aspects of the design should *not* be made easy and convenient? How can a design gracefully remind people about the value of art journaling while respecting the challenges (e.g., scheduling) in their lives? An overarching strategy for navigating this design space is *ambiguity* [11, 94], which allows people to understand and use technologies in personal, contextual and perhaps unforeseen ways. This means allowing for multiple ways to engage with art, without implying that any one is correct.

These ideas lead to a number of design insights and questions. For instance, how might a design allow for meaningful reflection and journaling both in situ and after the fact? It may be that different sorts of questions or activities would be required for now and for later. Perhaps different temporalities encourage different sorts of moral learning as well. Moreover, following work in reflective informatics, designs must account for personal differences among users, such as their readiness to change [89].

Next, this study suggests that a sociotechnical system for engagement with public art should not be limited only to one art type—and should allow people to define art for themselves. Indeed, this is an important feature of public art in the digital age [22]. At the same time, users should be able to use institutional genres and labeling if they so desire. Designs might encourage people to take an artful eye to a broader array of phenomena in their lived environment, stimulating enchantment and encouraging aesthetic experiences.

Finally, systems in this design space should allow for both private and shared experiences, not compelling one or the other. In her interview, Patricia cited the beer discovery and sharing app *Untappd* as an example of an app that achieves this balance well. She contrasted this with *Venmo*, which tells

users through its design that social posting is the preferred way to use the app. With respect to the deeper issue of ineffability, designs should allow for nonverbal ways for users to explore and document their experiences.

A Word of Caution

This paper started with the assumption that digital technology can help achieve the ethico-epistemic value of public art. While that may be the case, it is important for designers to consider that it may not. While this study does not address that question, future work should. In a somewhat related discussion, Akama and Light are skeptical that technology can or should be designed for mindfulness, but rather the intervention must be centered on the person. They write, “This is not something to delegate to machines” [1]. It may be the same with moral learning. Designers must recognize contexts and cases where there is an implication to *not* design, such as when there is “an equally viable low-tech or no-tech approach to the situation” [8], which may be the case here. Likewise, strategies for “undesign” might be considered, such as self-inhibition, in an effort to think holistically [85]. Designers in this area should proceed with caution.

Further Research

This work precipitates a number of questions for further research. Following from the discussion of what should not be designed, this study raises the question of what role digital technology can and should play in mediating art experiences—recall the *Paper vs. Phone* tension from p. —and which sorts of digital technology work best (and when). Such questions have begun to be explored [84], but the digital mediation of art experiences needs to be researched more thoroughly, particularly because effectiveness does not necessarily equal preference [80] and because prior work has been limited to content delivery rather than moral engagement.

Next, as mentioned above, ambiguity seems to be the most discussed design strategy in reflection and meaning-making, but what other strategies can be brought to bear on design in this space? Finally, work in reflective informatics has not yet been applied to reflection on art; such work could serve to validate and extend the findings in this paper and reflective informatics more broadly. Moreover, future work should examine the longer-term effects of reflective technologies, particularly focusing on the self-transformation that might occur through engaging with these technologies [59, 63].

Reflection on the Method

In the words of Wallace et al., the key to design probe research is “keeping design at the heart of the method” [103]. In part, this means including a reflective account of the design of the probe and participants’ responses to it.

Overall, the probe was effective. Participants who completed the probe enjoyed doing so. They appreciated the probe’s physicality and quality; some of them were eager to have their probes returned after the study, and they expressed gratitude for receiving a second one after their interview.

About half of the participants did not complete the probe. As Gaver et al. [37] showed, this may have more to do

with the participants and setting than the design of the probe. Probe non-use provides important information about the design space. For Gaver et al., the group who returned the fewest probes were “well meaning but happily distracted by their daily lives.” Perhaps the same is true of commuting Philadelphians. The brief interviews conducted with those who did not complete the probes sheds some light on this. One, who lived away from the city center, said he did not encounter any murals in the weeks he had the probe. Another said he always forgot the probe at home, yet still found himself noticing murals more. Granted, a change in methods may have garnered more participation. Recall that participants were not paid, a decision made so that the reflection would be intrinsically motivated—an important factor in learning [20]—but which may have had a cost in participation.

Last, participants’ use of the journal might have been affected by their being part of a study, particularly the knowledge that they would be interviewed. As with much research, it is difficult to say exactly how the presence of a researcher changed the dynamics here. In this light, it is interesting that half did not complete the journal, and that Dorothy (for example) did not record any entries. Similarly, Adam mentioned having forgotten about the probe for the first two weeks of the study. The method of convenience sampling may have played a role in this, as perhaps participants felt less “tested” with a friend than they would have with a researcher who they did not know beforehand.

CODA

While HCI originally focused on usability engineering, contemporary HCI appeals to other values, such as meaning and enchantment [69, 71, 73]. This paper suggests moral learning can be added to that list—a welcome addition as ethics becomes a more pressing issue in HCI.

Philosophers and psychologists suggest that art can further moral learning [56, 57, 60, 108], particularly when combined with journaling [30, 96], and this paper has provided context on the design space for creating such technologies. This paper shows how art journaling can be integrated into one’s life, and the value in doing so. It has outlined a set of challenges in this design space, such as the question of what aspects of an art experience can be technologized. This work may also inspire inquiry into other modalities for art engagement leveraging the unique possibilities of the digital.

More broadly, this work is part of a movement toward considering the *episteme*, *techne* and *poiesis* of both art and digital technology. At its best, art is a part of life, but too often today it is *apart from* life. As Foucault [34] wrote:

Art has become something that is related only to objects and not to individuals or to life. That art is something which is specialized or done by experts who are artists. But couldn’t everyone’s life become a work of art? Why should the lamp or the house be an art object but not our life?

Indeed, the design space explored here is precisely that of life becoming a work of art, one that warrants continued exploration and development.

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