Echoes of Social Presence: A Case Study of A Cross-Disciplinary Pedagogical Experiment

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ABSTRACT
This case study reviews the use of an ambient display system, dubbed Echo, for encouraging cross-disciplinary exchange about the design and role of technology systems. The study begins with a review of Echo: from the initial participatory interviews to the reflections and discussions generated by the installation. The second half of the case study analyzes why the experiment succeeded and where it fell short. To answer open questions about the experience, we look to the practice of dialogic aesthetics advanced by Grant Kester. We ask what it would mean to use the concept of the 'character of exchange' as a guide for the evaluation and design of cross-disciplinary exchanges.

Categories and Subject Descriptors
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms
Design, Evaluation

Keywords
Ambient system, social presence, reflective design, arts and humanities, dialogic aesthetics

1. INTRODUCTION
Exchanges across disciplines can challenge disciplinary blind spots and insert new practices into stagnating tool kits. Yet, work across disciplines is difficult and open dialogue often elusive. Boundaries, after all, emerge to keep like together and distinguish difference: i.e. "we do this, but not that because we value this but not that".

This case study explores an experience of bridging the disciplines of human computer interaction (HCI) and the arts and humanities. During the 2006-2007 academic year at Cornell University, the Society of the Humanities (SoH) hosted scholars from around the world to live and work together on projects touching the theme of 'improvisation.' One fellow, Phoebe Sengers, recognized this as an opportunity to involve humanists in building technology systems that challenge command and control logic and reify existing practices.

Given previous experience working across disciplines, Sengers chose to involve the fellows in an experience of, as opposed to just presenting an argument for, alternative approaches to technology. In the following pages, we will explore the challenges encountered in fostering this experiential approach, the experience of the dialogue, and lessons learned for future experiments. In reflecting on these lessons learned, we will pose open questions and look to insight from dialogic practices in the arts and humanities for guiding dialogue across boundaries.

2. ECHO: A CROSS DISCIPLINARY EXPERIMENT
Sengers first introduced the ideas motivating Echo to the fellows during one of the weekly round table discussions. During this forum, she proposed to develop collaboratively with the fellows a technological system demonstrating the ideas they discussed.

Sengers, and her design team, began with a brief sketch of Echo: an ambient system that would use sensing technologies to respond to and/or depict the character of presence in the house. In order to flesh this basic idea out, the designers sought to involve the fellows in the design process.

2.1 Initial Challenges
The biggest challenge the design team faced in developing this cross-dialogue experiential system was the level of resistance to technology in general. Many of the fellows described themselves as technology-averse or at least technology-suspicious. They viewed technology simultaneously as a utilitarian tool that one simply had to put up with and as a potentially dangerous power vehicle that one had to handle with caution. The fellows tended to prefer critiquing technology from a distance.

In trying to follow a participatory design approach, the designers found active resistance, e.g. declining interviews, and a more passive resistance, e.g. engaging in the interviews by providing restrictions, such as "*don't monitor the piano use*", "*don't use video cameras*", and "*don't do anything distracting*". As one of the designers described the process: "*They didn't really care what we did as long as we didn't disturb them…It seemed less like we were designing for them and instead designing around them.*"

In some cases, the resistance was due to surveillance concerns, thus prompting specific design decisions to continually undermine

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the possibility or even appearance of surveillance. In other cases, resistance stemmed from individual concern about aptitude with technology. To this, the designers aimed to create an experience that was easy and non-threatening. In still other cases, the resistance was an issue of relevance. Fellows questioned, for example, whether the system would simply be a distracting gadget and not appropriate for a place of serious scholarship. For this concern, the designers felt the appropriate response would be to leave the question of relevance open to the experience.

2.2 Implementation

For the eventual implementation, the designers opted to monitor measures of physical movement and display this as abstract video animations (see Fig. 1 and 2). The Echo system would monitor and display activity in two separate areas of the house. Rather than having a centrally located display pulling from dispersed sensors, the sensor and its display would be entwined to immediately show how collected information was used.

The Amplifier display (Fig 1) detected vibration (using a Piezoelectric Film Sensor: PZ-01/-02/-03). A perlin noise function animated colored bubbles bouncing up and down along a sin wave in the mounted display based on the activity information collected.

The Teardrop (Fig 2) display detected proximity of movement to the sensor (the Devantech SRF02 Sensor). As a general heuristic, the greater the amount of proximal interaction, the faster, brighter, and more clustered the teardrops would be. Ultimately, the designers aimed for simple, iconic, and visually pleasing animations in order to increase initial buy in.

The final implementation element involved framing – physically and metaphorically. The display screens and sensors were encapsulated within a custom-made wooden frame, painted white, and mounted on the walls. This effect added to its aesthetically pleasing quality but also cast it as a piece of artwork. This status was heightened by placing small placards next to the displays describing them in the manner of a museum label (e.g.– see Fig 3.). By framing the system in such a way, the designers aimed to make a system that people enjoyed having in their personal space in a manner very distant from the technology and surveillance cameras the fellows reacted against.

An additional component of the system's framing included the plans for evaluation or assessment. Initially, the design team preferred an informal assessment, but eventually two external evaluators were asked to conduct a formal evaluation that ultimately was structured as a round table discussion and personal interviews. The Echo system was up and running for a little over two months.

2.3 Engagement

Immediate feedback from the fellows indicated a general excitement about something 'new' in the house, combined with a sense of not knowing exactly what it was. Yet, this hesitancy did not stop people from experimenting and forming impressions. There were early stories of people dancing in front of the displays or jumping off the fourth stair to the landing to see if this could spark a greater effect. Over time, the fellows' engagement could be categorized into those who found it playful, those who wanted more from it, and those who ignored or discounted it.

All three of these relationships would be interesting to explore, although we received the most feedback from those who played with Echo and the least feedback from those who discounted it. This last group suggested in informal conversations that the system was 'junk', an 'experiment', or

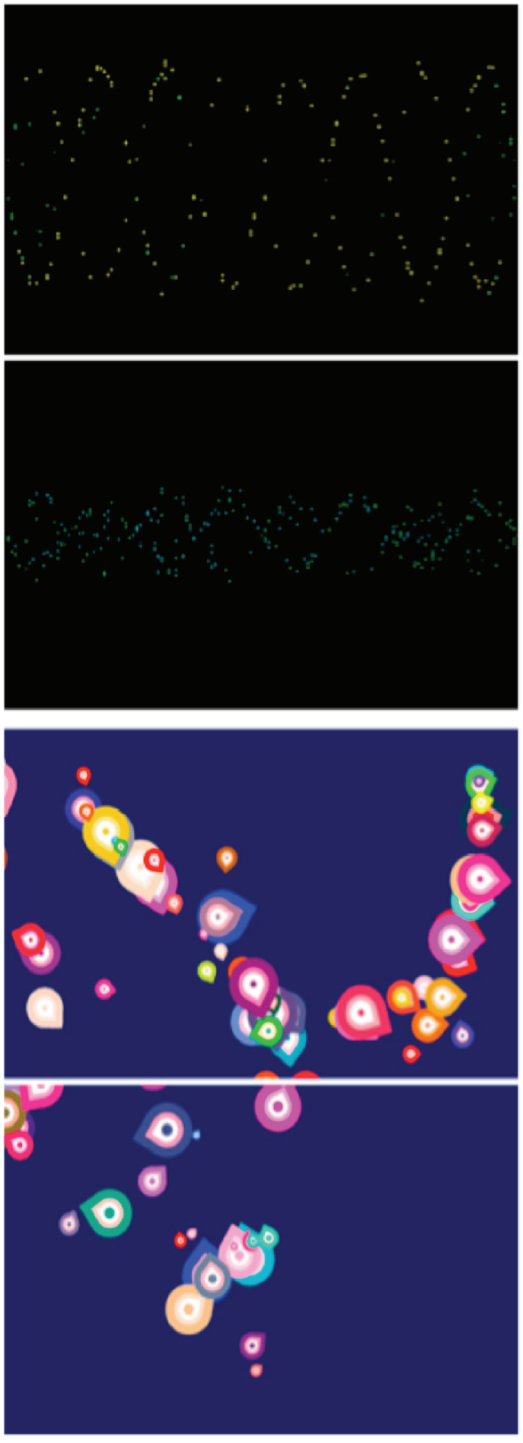

Fig. 1 (top 2 images): the Amplifier display

Fig. 2 (bottom 2 images): the Teardrop display

simply said they had no opinion of it. The group that found it lacking or wanted more from it described having initial interactions with the system but a tapering interest. One fellow found Echo too lightweight to generate discussion.

In contrast, the group who played with the system saw this lack of seriousness and its somewhat jarring nature to the typical nature of humanities work as an asset. This group described initially experimenting with the Echo displays to try and figure out what it was doing and why, but eventually developing a kind of relationship with the systems.

The following three quotes illustrate Echo's 'playfulness' and its effect for the fellows:

"I just felt a little connection to the things on the screen which is really crazy because it happens so momentarily…To have these little 'toys' basically mounted on the wall is really charming and surprising, so it prompts you to speak about it."

"It [altered] the course of interaction [in the SoH House] in a very good way. Meaning that I think academia would be much better if there were more room for play…and art."

"I think every time I passed them I would look to see if there was a reaction. I thought they were sensitive creatures. And these sensitive creatures would tell me something about myself. And sometimes they told that…I'm all red."

When asked if the project could be considered a piece of humanities work, fellows said "*not in its current form*". One fellow saw its humanities potential if a lot more time and preparation went into the experience – if the fellows could participate in a workshop around the ideas, read a series of texts, launch the system, immerse themselves in it, and then reconvene to discuss. Or as another fellow suggested: *"I think it would be a humanities thing if we were to connect our little isolated moments [with it] into a kind of discourse, or if you were to do that and then present it to us and we'd have a discussion about it. That's the culture of the humanities."*

Yet a final thought on this question of whether Echo 'worked' as a piece of humanities scholarship, one fellow suggested that perhaps its value was in bypassing disciplinary distinctions. She commented: *"It would be truly great if it was neither humanities, or technology, or art, or communication. But if it was just an interface platform to enable people to talk about varying methods"*. Another fellow offered a comparison with interdisciplinary discussion that focuses on a text at hand in order to help break people out of their roles of 'humanist' or 'technologist'. In this way, the experience of Echo could become the text that the scholars could have a unique experience of and then dialogue around without having to resort to methodological debates.

The short quotes and anecdotes provided here are a selection of the fellows' interactions with Echo drawn primarily from the roundtable and formal interviews. These discussions about Echo became part of the Echo experience. In other words, Echo with a formal discussion and Echo without a formal discussion were actually two different systems and the primary one we learned about was the former. Furthermore, by using outside evaluators for the formal assessment, we changed the nature of the conversation initially started by the designers. In reflection, we realized that the way we implemented the roundtable and interviews employed a typical social science approach of the 'outside/objective' evaluator when what we were after was an understanding of the dialogical experience evoked by the system, from design through implementation and including assessment.

Fig 3 (top image): The Teardrop display in context.
Fig 4 (bottom image): The Amplifier display in context.

3. LESSONS LEARNED

Overall, Echo both succeeded and failed. For some of the fellows, the system worked in that it caused reflection on the practices of technology and humanities and the possibility of intersections.

The display also worked in that for some it caused reflection on the climate of social presence in the house. Another measure of success was that several fellows indicated willingness for edgier designs suggesting an increased level of curiosity and trust.

3.1 Why Echo Worked

In reflecting on Echo as a successful experiment of cross-disciplinary dialogue and reflection, we identified several influences. First, the material experiment itself was critical. The roundtable Sengers hosted prior to the Echo installation had a very different interaction than the roundtable after the fellows had experimented with Echo for two months. This is perhaps not surprising: experiencing something gives one a different perspective than a more abstracted approach. Yet it is worth noting because the culture of work in the humanities tends to eschew the coupling of intervention and study.

Secondly, the framing strategies mentioned above played a large role in Echo's positive uptake. There are the obvious frames, such

as the literal wooden frame and the structural fame of the roundtable format. There were also less obvious frames important to consider. For example, fellows were implicitly encouraged to engage with the system because the director supported it – giving it a degree of legitimacy. The fellows could ignore it but this would not be in the spirit of their fellowship year of dialogue on improvisation. The public face of the experiment, Sengers, also played a pivotal role in the framing. As the fellows grew to know each other over the year, interacting with the project could be considered a collegial act.

Finally, the designed form of the experiment, not merely the fact that it had a form, played a critical role in fostering the kind of reflection and dialogue desired across disciplinary boundaries. Namely, Echo's playful quality prompted engagement and discussion.

3.2 Why Echo Did Not Work

Echo also fell short for the fellows and designers. Some fellows simply ignored the system and declined opportunities to talk about the system. Some fellows suggested the system was trivial. Our sense is that Echo might have reached a group that was already open to playfulness and experimentation. Echo reached those who were sympathetic or primed to be sympathetic to the argument proposed. Those who may have a more polarized point of view did not come to the (round) table.

We also had a sense that Echo fell short in the duration of the dialogue and reflection it sparked. As one of the designers commented, Echo as a system was nice but not monumental. What was important was not the one-off experiment of Echo but the ideas that Echo embodied. Echo was meant to act as a thin end of a wedge, opening up a much wider conversation. Yet, Echo is now packed away in a box somewhere and although we'd like to think the conversations are on-going, the momentum ended with the fellowship year.

We can only speculate on possible reasons why certain people chose not to engage with Echo and about the duration of Echo's impact. These are not uncommon shortcomings of traditional evaluation studies. Yet our aim was to bridge the humanities and technology design. In the evaluation, we found ourselves falling into the trappings and tropes of the latter.

3.3 Open Questions

Where our experiment fell short then was in the breadth of the conversation (in terms of who was involved), the duration, and the issue of assessment. In moving forward, we have several open questions:

- How can more extreme points of view or differences be brought into the conversation? Is this even a useful directive?
- What hooks are needed to turn a provocation into an ongoing conversation?
- What would an assessment or evaluation look like that bridges disciplinary practices of assessment?

4. DIALOGIC PRACTICE IN ARTS AND HUMANITIES

As we move forward in our research, addressing the epistemological divide between the arts, humanities, and human-computer interaction [3], one area offering great promise is the study of dialogic aesthetics.

4.1 Dialogic Aesthetics

Although dialogical aesthetics encompasses a range of practices and critiques [1][2][4][5] the common focus is on the social exchanges between artists and others, working together towards the construction of meaning, and often social change, by activities of conversation and listening. Dialogical aesthetics bridges identities and disciplines: artists, activists, government officials, workers and others are brought together in moments of interaction and exchange.

Dialogic aesthetics balances some familiar and unfamiliar practices for both the humanists and technologists. It is a recognized movement within contemporary art, yet not all contemporary artists would embrace its agenda. For example, the practices Kester explores eschew the idea of a single artist or a transcendental meaning embedded in the art. Rather, the work of art is the social exchange and structure produced. The process of creating and the activities of engaging the work of art stand in equal significance to any material object produced.

Dialogic aesthetics also shares similarities as well as stark differences with traditional technology practices. For example, the metaphor of a conversation has been used for interface design and fields such as Computer Mediated Communication (CMC) or Computer Supported Cooperative Work (CSCW) have a long history in studying the practice of dialogue and the ways in which technology inhibits or supports communication. What we are proposing here, however, in drawing on dialogical practices has a different focus.

Our primary interest is not in how technology can support communication in an instrumental fashion, where technology is the tool *through which* dialogue may or may not occur. Our interest is in how technology can be used in a provocative fashion, where technology is the prompt *around which* dialogue may or may not occur. From a dialogical aesthetics perspective, the focus is not just on how people engage with the set piece, but how the artist (designer and/or evaluator) engages with them. From this perspective, the social encounter is the work of art, and significance of the work is to be found in the kind, or character, of exchange that occurs.

4.2 Dialogic Aesthetics and Echo

Fully assessing Echo from the perspective of the character of exchange is beyond our scope here, but an initial review suggests this approach's value. From a dialogic practice we must critically examine Echo's character of exchange, namely the ways in which the prompted interactions shaped social and power relations between the participants. As noted by critic Claire Bishop [1], it is not enough simply to ask whether or not a work includes dialogue, we must ask: What is the quality and affect of that dialogue?; Who is drawn into the dialogue and who is excluded?; Who is privileged in the dialogue in terms of voice?; and Does the dialogue allow for differences and dissonance?

These questions suggest that one of our first tasks would be to unpack further the initial resistance people expressed about the system. How did the perception of technology as an unforgiving master become so embedded? How might this perception have prevented some fellows from engaging in the experience and subsequent dialogue?

On the one hand, that some people chose not to use the system is not necessarily a negative. Rather it could be taken to signal that the character of exchange allowed for the participants to feel open to express their agency in regards to the use (or non-use) of the system. On the other hand, reflecting on the character of exchange also compels us to ask why certain conversations did not take place. Why did we, as we have surmised, only reach those already sympathetic to the proposed argument?

Correspondingly, a dialogic approach would alter the shape of evaluation. For example, it would challenge the idea of an external evaluator. To support an open exchange, in which the participants were candid about their experiences and issues with the system, would require the development of dialogic strategies and tactics. The development of these and the resulting experiences would become part of the research project itself, perhaps even of equal importance with the design and use of system.

In reflecting on why Echo worked at all, we surmised that Sengers' role as champion and fellow colleague was significant. From a dialogic aesthetics perspective, we would probe the role of Sengers on the engagement with Echo further. In dialogical aesthetics, the personal experiences, beliefs, and passions of the creators are critical aspects shaping the dialogic interaction. But drawing out the person of the designer is not a familiar practice, at least for the field of HCI, and one that requires further experimentation.

Finally, the dialogic aesthetic turns on the character of exchange at both the pragmatic and political level. It would entail describing what kinds of conversations transpired through Echo and reflecting on what supported these conversations over others. At a more political level, this would require explicitly articulating the qualities of exchange one wants to enable – for example openness, diversity, conflict without required resolution – and then accounting for these qualities through the assessment.

Engaging dialogical practices will not eradicate the epistemological divide between the arts, humanities, and human-computer interaction, but it may be useful for building bridges. While dialogical practices challenge the focus on technology and task-oriented functionality common to HCI, they also enable a rich description of use and experience, which is a desired objective of HCI research. Moreover, the broader discourses of dialogical practices provide a set of theories and critiques to draw upon — e.g. [1][2][4] — which we believe will continue to direct us towards more interdisciplinary practices and pedagogy for the design of interactive systems.

5. CONCLUSION

In future attempts at an Echo-like experiment of cross-disciplinary exchange, we will again create a tangible system that provides a common ground for a shared experience. The shape of this system depends equally on how the system is framed and supported (i.e. the 'outerface' concerned with everything around the system) and on the designed system for engagement (i.e. the 'interfaces' to the system). We have learned that a balance between the familiar and unfamiliar is required. Something that is too familiar will not go far enough to spark reflection, new thinking, and incentive for dialogue. Something that is too unfamiliar can lead to dismissal, confusion, and frustration.

In seeking this balance between the familiar and unfamiliar, we have found the practices of dialogic aesthetics to be an important resource. Echo was developed as a project to prompt open dialogue, yet the dialogue that developed was not always of the extent and kind desired. Dialogic aesthetics plays in this experience of emergent meaning.

Yet although dialogical practices will suggest some bridges across disciplines, they are not a panacea. They will be met with resistance in HCI, just as they are met with resistance within the arts. There is no universal ground for interdisciplinary exchange or pedagogy, only avenues of interactions.

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