ABSTRACT
In this paper, we describe an interactive artwork that uses large body gestures as its primary interactive mode. The artist intends the work to provoke active reflection in the audience by way of gesture and content. The technology is not the focus, rather the aim is to provoke memory, to elicit feelings of connective human experiences in a required-participate audience. We find the work provokes a diverse and contradictory set of responses. The methods used to understand this include qualitative methods common to evaluating interactive art works, as well as in-depth discussions with the artist herself. This paper is relevant to the Human–Centered Computing track because in all stages of the design of the work—as well as the evaluation—the focus is on the human aspect; the computing is designed to enable all-too-human responses.

Categories and Subject Descriptors
J.5 [Computer Applications]: Arts and Humanities: Fine arts.

General Terms
Performance, Design. Experimentation, Human Factors.

Keywords

1. INTRODUCTION
In this paper we discuss an artist’s interactive installation work, in which the primary means for interacting with the work lies in bodily gesture (see figures 1, 2). We work with contemporary inter-disciplinary methods to evaluate a more ambiguous ludic interactive technology work. We discuss the relationship between gesture and reflection and embodied thought and action. We then describe the interactive artwork, examine the artist’s intentions for the work and include perspectives from our discussions with the artist into our evaluation methods. We provide a short analysis and discussion of our findings, which include an undervaluing of ‘free play’ and gesture, and a divide in experience and expectation between regular gallery goers to the more technical participants.

We close with an appreciation of the evolving audience experience and suggest the work was more successful in its human-centered intentions than the multivalent feedback would suggest. This paper discusses an interactive work that focuses on occasioning emotion and memory in its participants. The aim of the work is to provoke human response, while the aim of the evaluation is to gauge what aspects of the work people engaged with—to better understand the responses and how they were elicited. The analysis is consciously multi-perspectival and interdisciplinary. The authors of this paper come from diverse disciplinary backgrounds—from Visual Arts, Critical Theory, and Interaction Design—which are melded into this discussion. In this research we ask simple questions: What is this work? How does it function and how might it affect its audience? How can we better understand the participant experience?

Figure 1. The ‘little girl’ performing in the shadows
Figure 2. Gloved figure interacting with the child

1.1 EVALUATING INTERACTIVE ART
Our work on evaluation methods for interactive art occupies a space of increasing interest around how to understand people’s interaction with technology. Some of this work comes from a visual arts and/or humanities background, where artists and art critics explore and interpret the meaning of artwork using well established methods of criticism, reflection, and review. From an artist’s perspective, this involves methods such as shadowing, informal interviews, observation, and discussions with audience members, where the concern might be to understand how the work is being interpreted by the audience, providing input which may influence future installations of the same work, or new works exploring similar themes. There is also active interest in this space from the field of Human–Computer Interaction (HCI). When researchers talk about evaluation in HCI, they are predominantly referring to methods that have their origins in psychology and sociology, with an aim to provide authoritative (often experimentally validated) accounts of how effective the technology is at attaining some predefined
goal: is it ‘fit for purpose?’ Methods such as usability testing, questionnaire evaluations, and cognitive walkthroughs have been developed and provide feedback to the developers of interactive technologies about how well their technology meets the needs of its intended users. These scientific methods, which try to arrive at objective facts about the technology being evaluated, stand in contrast to the more subjective and interpretive approaches taken in interactive art. However, over recent years there has been a move away from looking only at interactive technologies in the workplace, towards broader concerns with understanding how people interact with technology when there isn’t necessarily a job or task to perform, where activity is less goal directed and more experience focused [12].

An earlier shift away from experimental, laboratory-based evaluation towards situated human activity saw the rise of ethnographic observation being used to inform the design of information technology. This soon led to it being proposed and used as a method for evaluation [10]. The ethnographic approach to observational fieldwork was extensively used to study settings where a broader social, environmental, or cultural context is important, and is very similar to the shadowing and ‘fly-on-the-wall’ methods adopted in this study.

As Interaction Design has taken the field of HCI closer to people’s everyday lives, and has become more concerned with how people can adopt and appropriate technology into their lives, there has been a move in many projects to more subjective approaches to design. These approaches include cultural probes [6] and cultural commentators [5] where both have been used in combination with ethnographic study as methods for evaluating interactive art [7]. Experimentation with these methods is taking place along with moves to adopt a more pluralistic approach to interpreting evaluations from different perspectives [18] and allowing for polyphonic assessments [5] where “the researcher orchestrates a multi-voiced, divergent set of views for audiences to consider”[5: p.304].

In evaluating a work such as Hanna Haaslahti’s Space of Two Categories—a work that produces multiple and often contradictory readings (see section 4.1)—adopting a multi-view, multi-method, polyphonic approach proves effective in taking account of these alternative readings of the work.

1.2 GESTURE AND REFLECTION

The wide variety and divergent readings of Haaslahti’s Space of Two Categories are not necessarily accidental, or a failure in the artwork to produce a singular or dominant reading. Indeed, Haaslahti’s work enables multiple readings, and one particular way it does so is in its emphasis on gesture and reflection. In Space of Two Categories, the role of physical gesture is an important one, for gesture is the primary means by which the participant engages with the work (see section 2.1). Moreover, the work’s foregrounding of gesture—of physical interaction—is intimately connected with its status as an engaging, interactive artwork. In Art and Engagement [2], Arnold Berleant writes of the importance of gesture in art, particularly in dance, whose “embodied action” encourages engagement and “elegantly displays the performative contribution as a process of bodily engagement, not just a psychological attitude” (p.5). According to Berleant, gesture, “differs from ordinary motion by possessing meaning; it is expressive movement that reflects vital force” ([2: p.155]).

More recently, Sha Xin Wei has examined in some detail the relationships between gesture and agency in “responsive media spaces,” his case study being the TGarden project [19]. In these spaces, Sha argues, gesture becomes “material”:

a gesture is more than the physical movement—it comprises also a temporal texture and a multivalent set of activations in the machinery... A player hops, rolls, jumps, and promenades in order to play the media. [21: pp.457–58]

Berleant and Sha’s interest in the gestural aspects of interactive artforms reflects also the twentieth-century philosophy’s renewed interest in the relationship between embodiment and thought, between body and mind. Emmanuel Levinas is one twentieth-century philosopher for whom embodied gesture becomes critical in order to think about thought:

Thought itself is inserted in culture through the verbal gesture of the body which precedes and goes beyond it [...] The body is the fact that thought is immersed in the world that it thinks and, consequently, expresses this world while it thinks it. The corporeal gesture is not a nervous discharge, but a celebration of the world, a poetry. [14: p.525].

The role of physical gesture in Space of Two Categories is, as the above would suggest, at once poetic, interactive, verbal, material, temporal, and implicitly linked to thought and reflection. Indeed, in the Space of Two Categories gesture provokes reflection—bodily movement provokes mental contemplation.

Haaslahti’s work is, in effect, a piece of reflective art—the participants’ self-reflection being induced by the gestural act and the ambiguity of the space inhabited by the child. In her 1964 essay on the films of Robert Bresson, literary theorist Susan Sontag provides a valuable definition of reflective art, which “detaches” and “provokes reflection.” Although reflective art requires or elicits a kind of detachment on the part of the viewer, Sontag maintains that “great reflective art is not frigid. It can exalt the spectator, it can present images that appall, it can make him weep.” What characterizes reflective art is the mediated nature of its emotional appeal, which results in the emotional involvement and gratification of the participant being “postponed.” Nevertheless, according to Sontag, in truly reflective art, this “detachment and retarding of the emotions, through the consciousness of form, makes them stronger and more intense in the end.”[20]

Haaslahti’s work creates a productive tension between gesture and reflection. Haaslahti makes the viewer’s body an active and a necessary part of the artwork. Space of Two Categories cannot exist without a viewer to participate in it, to use their bodies to interact with it. Moreover, the work requires the audience to step literally into the spotlight. Gesture requires an embodied, active engagement in the work, one that then provokes an almost detached, disciplined, yet not “frigid” reflection. This reflection, while it potentially postpones emotional engagement, ultimately results in an intensification of emotion. This deferred heightening of emotion through gesture and reflection can be seen in the participants’ often ambivalent responses (see section 4.1) where participants had widely varying experiences of the work.

2. THE WORK

2.1 The Artist, the Art

Hanna Haaslahti is a media artist working and living in Helsinki, with an 11-year international exhibition history. Haaslahti’s experience ranges from set design, interactive dance installation,
working as a scriptwriter and a director for dance films, to collaborating with various Finnish choreographers. A persistent focus throughout her work—and, in particular, her interactive artworks—is the centrality of the human physique. Predominantly, in Haaslahti’s work, the entire body interacts with the installation, which in turn responds to the presence and movements of its participants. In her works, Haaslahti develops interfaces that are based on human gesture and presence, exploring physical relationships between people and technology via bodily interactions.

Haaslahti’s Space of Two Categories is a salient example of the artist’s embodied, gestural approach [8]. In this interactive installation, the shadows of the participant audience members are reflected onto the surface of a rear-projection screen by a single light source in a darkened space (Figure 5). An ‘apparition’ of a young girl (a child) wearing a white dress can then be seen moving inside and across these shadows (Figure 1). Each person entering in front of the screen casts their own shadow, into which the young girl appears and moves, performing a variety of movements including dancing, running, walking, skipping, twirling, smiling, lying down, looking directly at the viewer, laughing, shrinking, and growing bigger (Figure 3).

For Haaslahti, the “human body is a transforming entity, which gathers and stores our life inside an aging and changing form better than any computational device.” As such, Space of Two Categories is not about [the] wonders of technology, but [the] wonders of [the] human body, which are revealed within [the] technological environment... The phenomenological body gathers information with all senses, which means that somehow all thought is embodied.

The transformational, phenomenological nature of the human body is reflected in the figure of the child, which traverses the shadows of the participants’ bodies. “Childhood,” according to Haaslahti, represents “a previous state of adult body, and many things in the rest of our lives are shaped by the way we experience things during that time.” Space of Two Categories “evokes our childhood as a phenomenological state of being”—one that continues to exist as a bodily memory, despite the adult “rational mind [having] put those memories aside.”

Yet Haaslahti does not wish to reduce the relationship between the image of the child and the shadow of the participant to an overly simplistic one—one where the participant sees the child solely as an expression of the bodily memory of their own childhood. Rather, she states, the connection between the girl and the shadow limiting her existence is ambiguous. After a while, we notice that the girl is not alone in the dark space, there’s somebody who plays with her.

This other figure within the “dark space” inhabited by the young girl in white is in marked contrast to her. This figure is dark and indistinct, a shadow-figure with gloved hands (Figure 2). In this way, according to Haaslahti, “the space around the little girl is not inert. The circle of people around her continues inside the darkness of the screen.” Space of Two Categories is a work that invokes embodied gesture in order to provoke reflection in the participant audience. In its use of the figure of the young girl, it is both approachable and homely, but the ambiguity of this figure, and the space in which it plays, renders it simultaneously unhomely, or uncanny. By examining participant responses to Haaslahti’s Space of Two Categories, we aim to draw out the ways in which the work elicits often strongly ambivalent, reflective responses through its emphasis on physical gesture and its use of emotive images.

Figure 6. Shadows are tracked, analyzed & re-projected back

2.2 Technology

A rear projection screen divides the installation space into two rooms; one where the audience interacts with the work (the interactive room), and the other to house the technology (the technology room). The shadows of people standing in the darkened interactive room are reflected to the surface of the rear projection screen by a single powerful light source (Figure 5). The light is positioned a few metres away from the screen so that when the participants walk in front, their shadows are thrown onto the screen (Figure 4). An ‘apparition of a young girl’ can then be seen moving inside these shadows (Figure 3).

The video camera and video projector and computer are positioned behind the rear projection screen—in the technology room, so that the technology is hidden from the public view and kept separate from the audience experience of the work. The camera and software constantly monitor a restricted area of interest on the other side of the screen where the audience moves. The software is tracking and analyzing the video of people’s shadows reflected on the rear projection screen from the interactive room (Figure 6). The shadows are then re-projected back in real-time with the imagery of the young girl added into them. The computer vision software is written in MAX/MSP/Jitter and a black and white digital surveillance camera, fitted with an IR filter sends real time video to the PC. The rear-projection screen is projected on from both sides.

3. EVALUATION: THE ARTIST VOICE

The first author of this paper, Ann Morrison, is an installation artist whose research interests lie in understanding engagement in interactive art installations. Morrison’s research includes identifying aspects of installations that enable and elicit sustained participant engagement. A priority is to include the perspective of the maker into what is being evaluated.

Haaslahti approached Morrison at ACM Multimedia 2007 in Augsburg. At the time Morrison was displaying a poster...
presentation, which included an evaluation of her own interactive work, as well as ACM Multimedia 2006 Interactive Art Program interactive installations, and was discussing with colleagues which of the 2007 Interactive Art Program installations might be suitable to her research on sustained engagement. Haaslahti, witness to the conversation, then asked Morrison if she might evaluate engagement in her own work, and Morrison agreed despite—or perhaps because of—having a sense that engagement with the work was short-lived.

In an earlier paper Morrison et al [15] discussed that interactive art installations present a broad range of issues that are best evaluated by way of a “multi-method strategy” [9]. Again, for this evaluation, these methods included informal observations, informal discussions, completing questionnaires, follow-up informal discussions, and observation of, and discussion with the participants to have a better understanding of their areas of expertise—in order to better understand their own expectations in experiencing the work.

In addition, we included the artist voice as part of the method alongside the artist methods for gathering feedback. This differs from work-based studies, where use or function, rather than experience, is of primary importance [12]. Here discussion with the artist on the work, previous work, future work, and expectations, considerations and processes involved with this work are fore grounded as major aspects to be taken into account when evaluating the ‘success’ of the work (see section 4.1 and 4.2).

The Audience Demographic. There were 15 participants in this study, and for all participants at least three and often more of the above methods were used. The audience demographic consisted of mainly participants from ACM Multimedia Conference 2007 (13), or other artist-painters from outside the conference (2). There were five women and 10 men, aged between their early 20s to their early 50s, with the majority being in their mid-30s or early 40s. Of the 15, eight of these made regular gallery visits (more than 3) each year, and 12 work in Information Technology or a related or technical field. Of those who work in Information Technology, two were female, and 10 male.

The majority of the interviews, observations, and discussions were conducted on a quiet afternoon on the last day of the exhibition. Many people were observed playing with the work, though not all took the interviews or questionnaires. Most people took their time, spending on average more than five minutes interacting. Some interviewees had played with the work during the opening of the event. These interviewees were later approached at the conference with questionnaires.

4. FINDINGS

4.1 The Participant Experience

Responses to the work were varied and often divergent, most notably in regard to the different levels of concerns for the welfare of the child. Other clear themes, outlined below, that emerged in participant responses are the relationship between gesture and reflection, pleasure of use, reflection upon the technology used, the relationship between interaction and free play, and ambivalence, or the reflective/technical divide.

Concerns for Welfare and Agency of the Child. Participants expressed mixed reactions to the figure of the child being strongly ambivalent—some participants reported simply enjoying the movement of the child, while others expressed mild to strong concern over her welfare, and yet still others stated they actively wanted more control over the child’s movements. One participant noted that she was “left feeling uncertain as if [she were] in ominous circumstances and witness to something that might or might not be okay.” This concerned response was in marked contrast to the participant who, instead, found the work inherently amusing and lighthearted, providing the following feedback: “Thank you it was funny.” Somewhere between these two poles of concern and amusement sit responses such as: “I especially like the haunting quality of the work, ‘capturing’ the girl with my body-duality of protection and suppression/domination of the child. It felt bad and good, like something I was doing to an innocent child.”

Gesture and Reflection. We also found that participant responses to the figure of the child were closely linked to gesture and reflection. As the latter response above exemplifies, the gestural (“capturing” the girl through gesture) elicits reflection upon the ethics and pleasure of doing so. Where some participants reflected upon the pure enjoyment generated through their gestural “dance” with the child (one participant expressed enjoying the “sensual connection between my movement and the child’s”), others asked for more control. For example, one participant had “the impression that the girl moved along with you, according to [your] movement,” and wanted to “make the girl do different things depending on your moves/shapes.” Ultimately, this participant felt “the interaction with the girl is too limited.”

Pleasure of Use. The pleasure associated with gestural interfaces is a contributing factor in the experience of the work. In Emotional Design: Why we love (or Hate) Everyday Things, Donald Norman writes of a “gestural system [as]... agreeable to the senses...[and] pleasurable to use, [which] engenders good feelings in users” [16]. And for Haaslahti, provoking embodied remembering or recognizing of one’s own childhood, one’s own freedom of movement and capacity for unexplained joy (or not) is a direct intention of the work.

Overall then, we see a wide range of responses, which moves from a desire to protect the child, to ambivalence about the participant’s own role in the work but an acknowledgement of the pleasure of use, through to a desire for more shadowing and range of engagement in response to participant activity.

Technology Reflections. Other responses, though, suggested adding another interactive child or other technological additions. For example, a participant expressed the opinion that “the work needed one more dimension”, such as to make the “system detect [the] sex of a person. So two videos, one for man, one for woman.” Other feedback suggested the work might show a “second child” when two participants stand close to one another.” Another participant stated it “seemed like the girl was responding to the shadow” and that it “worked even with two people casting shadows.” Overall, another said “it was engaging—I could have played with it for a long time.” These responses are discussed in the language of those working within the interactive genre (either in the art world or the technology one)—experts in the field and participants in a specialist community of practice [15]. These understandings are informed by what the participants already know of the area, and what they know to be technically possible with interactive works such as these. So for these participants, the pleasure of use by way of gesture generated a flow of ideas around the interaction possibilities, expanding upon the technologies employed. These participants questioned how might other interactions further the engagement and further the gestural potential of the work. They posed these questions regardless of
the fact the artist deliberately intended for the technology to remain ‘hidden’ and for the responses to be about the human condition.

Free Play and Interaction. But not all participants experienced a flow of ideas or easily entered the meaning of the work. By way of contrast, another participant had “wondered how to wave [their] arms” adding “somebody told me to do that”. While enjoying “watching [the] girl move” they had experienced difficulties which detracted from the experience, in that they “felt [they] didn’t get the full experience” and suggested that the work might “show different video depending on users interactions” to assist being able to ‘get’ the work. Another participant said the work “needs some kind of iddle.” “Why she comes out at you and then disappears? [sic] This is confusing.” This participant felt that the girl occasionally “loses track,” and made the suggestion to “use sound”.

For Haaslahti, the most significant aspect of Space of Two Categories is that it is a work that contains no clear instructions on ‘what to do’—“no goals in interaction.” Haaslahti believes too much guidance kills the magic of the work—the sense of uncovering and discovery that emerges through finding your own way through a work. This is especially true of Space of Two Categories, in which this reflective uncovering may lead to “an internal discovery at the same time, about [one’s] own childhood”.

However, Haaslahti says, this lack of guidance also “makes people uncertain. Many are used to [a] gaming situation where it is very explicit what you need to do”. Haaslahti aims instead to “take away that goal-oriented attitude in physical interaction”, which she considers ignores or devalues the ideas the work is built upon. In a gaming situation, players have clear targets, which they either meet or do not meet. This relatively clear-cut competition between the player and the machine represents the conventional HCI understanding of engagement; however, for Haaslahti, such “immediate feedback with actions” is uninteresting.

Ambivalence, or the Reflective/Technical Divide. Overall, we found that while most participants responded to the gestural aspects of the artwork, some did not appear to react as strongly to the intended reflective aspects as others. These participants discussed more the “technology” in the work. It could be interpreted that they tended not to see the girl as a subject within the work, but rather as a series of video loops, a technological object that was effective or not within the work. Other participants had strong affective responses to the work. Some found the engagement with the child to be fundamentally playful. One commented on the work’s “haunting” nature, while others seemed to detect an ethical dimension to the work—some expressed concern for the “safety” of the child, some saw malice within it. Finally, some, in direct contradistinction to the first set of participants described above, felt a strong need to not make the child simply a form of entertainment, and were concerned that the work should not over-control or manipulate the child like a doll. A concern echoed by the artist in the making of the work. These ambivalent, often contradictory affective responses to the work reflect the productive tension between gesture and reflection in Haaslahti’s work.

Participants who had difficulties either with the interactivity or with finding logic in the work, seemed to offer up technical solutions more readily than those who engaged with the philosophy within the work. A factor that strongly emerges here is a relationship between those who regularly visit galleries (more than three times per year) and a readiness to reflect upon the intended meaning in the work. Those participants who regularly visited galleries appeared more likely to reflect upon the meaning in the work and, indeed, appreciate that the work invites them to reflect upon it. That is, these participants seemed more likely to consider, in some way, the relationship of their own gestures to that of the young female child, or to the position or meaning of the child, dancing and moving in this work. On the other hand participants who said they were perplexed by the work, or those who expressed a technical desire for it to ‘do this’ or ‘be like this’ tended not to be regular gallery visitors. These participants were more likely to ask for more technology to be added, as though somehow more activity—more action—would make the meaning in the work or the interaction more directly meaningful.

Figure 7 and 8. Images of the ‘the little girl’ with gloved hand.

A particularly salient example of the reflective/technical divide that seemed to characterize the participant responses lies in the gloved hands of the second, shadowy person who plays with the girl in the work. Many of the participants did not notice the gloved hands in their initial play with the work (Figures 7 and 8). However, the participants who are artists or regular gallery visitors did see the hands that hold the child, and these participants responded in a very different way to the ‘intent’ they saw symbolized in those gloves. Some saw malice, while some felt a need to ensure the child was not simply an over-controlled object of entertainment. None of the participants who wanted more technology commented on the gloved hands. In this respect, from the two sets of participants emerged two conflicting readings of the work.

4.2 The Artist Experience

For Haaslahti, the process of creating a work and then opening it up to user testing is a “very vulnerable” one. She describes it as a “kind of lonely work” in that “you hope that you are right, [but you may be] sometimes wrong,” and it can be “difficult to listen to people’s suggestions”. When she first exhibits one of her works, Haaslahti says she likes to watch people using it, because it “teaches so much”. She sees which parts work, and which parts do not work so well. She then uses that knowledge to reiterate the work. In general, she finds that reiterating the work three times is enough. In the case of Space of Two Categories, Haaslahti says the first version had more interactive features, such as shadows that would touch each other, or another kind of video clip came up. In this version, however, participants had difficulty understand the meaning of these changing video clips—there were too many features that could not be controlled with the shadows. In the final iteration, then, she stripped the excess features from the interface in order to make an elegant gestural work.
Although Haaslahti recognizes the value of being open to participant feedback, she maintains that it is also important to retain an artistic distance, “to listen to [her] own understandings”. She acknowledges the “collective way is [to] create together … another interesting way to do.” Yet, she says, art is “traditionally” about the artist, about the work “coming from you”, and in order for her to maintain this, Haaslahti needs to “retain some distance from the direct feedback”.

For example, participant feedback sometimes questioned the ethics of using a child within the work. Some participants who knew Haaslahti expressed the opinion that she should have used her own child (a boy) in the work and not someone else’s child. However, from the artist’s perspective, the gender of the child was of critical importance—the girl could not simply be exchanged with a boy. Haaslahti says she wanted to incorporate the figure of a girl, because that is where her own experience as a child comes from. It is also where her understanding of her own embodiment comes from, and, as Haaslahti explains, she feels she cannot speak as an artist from the male position. The child in the work is Haaslahti’s niece—her sister’s daughter—and the gloved hands in the work (the shadowy figure playing with the girl) are her sister’s hands. In effect, the film is of a child playing with her own mother, but the shadowiness of the second figure throws up productive ambiguities in the work.

Haaslahti’s mixed feelings about the interplay between participant feedback and authorial intent reflect also the philosophical shift that has reshaped the roles of artist and participant (or author and reader) since the advent of poststructuralism. In 1967, Roland Barthes wrote a seminal essay “The Death of the Author,” in which he argued that trying to understand a text purely by reference to the author’s intent or biography inherently limited the reading of that text. A text, he maintained, should not regard the capital-A Author as the primary generator of meaning within a work. Removing this God-like author figure from the text would liberate the reader and open up multiple critical readings of the text, which is itself multiple and not singular [1]. In regard to art and the role of the artist, once the work is out in the world, ownership and the author’s/artist’s intent becomes as if irrelevant. Interpretation is placed in the hands of the active readers of the work.

Yet there remains a complex interplay between author, text, and reader or artist, artwork, and participant. In Space of Two Categories, for the artist, the artwork is only strictly successful in terms of intent, when a participant makes an individual interpretation of it; however, it is the artist’s inclusion of gestural technology and affective images that activate participants’ body-memory and their reflective relationship to their own childhood. Ultimately, for Haaslahti, her work is “really about [making] something essential,” about creating a “tool for this kind of collective play” that can engage “as many people as possible,” thereby making an essential contribution to “understanding human life”.

5. DISCUSSION

5.1 Ways to Participate

From the audience response we could easily interpret that the more technical, less gallery-going set of participants has a tendency to look at the ‘little girl’ as an object of playful entertainment rather than as a stimulus for reflection. The responses of these participants did not show reflection in the sense that they did not establish any pathways to relate their experience to their own previous states of childhood, and on first reading could easily be misinterpreted as requests for more technology. Rather though, what emerges is a reflective engagement on how the installation works, a desire to understand and reflect on the relationship between one’s own movement and what is happening on the screen. In this sense for these participants, the engagement and reflection with the work ‘sees through’ the artist’s intent with the work, and understands the work almost from an engineering perspective. The response is still reflective, but it is reflective about the mechanisms of interaction, rather than about the content displayed. In contrast with the participants who were concerned for the girl’s safety, this set of participants seemed to look through the work to uncover what makes it happen, and that is where their engagement and reflection lies.

This tendency might be explained to some degree by pointing out the particular contingencies of interactive artworks and the ways in which people approach them. Participants in an interactive artwork not only bring their own pre-determined expectations to the work, but the work itself can trigger new ideas for them. In this case, participants may also want to see their ideas put into play, and with an exhibition shown within ACM Multimedia Interactive Art Program we are largely working with a community of experts (see Morrison et al [15] for a larger discussion on this). Those working directly with technology will also have many creative ideas about technology use within the work. However, these technical ideas may force expectations of what might happen in a work, such that the work itself is not considered as an experience in and of itself—outside their own often in-depth understandings and/or expectations.

This distinct division between opposed ‘readings’ of the work and the correlation between participants’ gallery visits and likelihood to reflect on the work were not found in the previous case studies. This is a new finding in the broader research project of which this case study is a part. As such, this represents a significant finding both for the case study and for the broader research project. This finding is worthy of future follow-up research, needed in particular due to the small sample size used here.

5.2 Viewers fail to recognize their actions

The first author observer sat outside the installation, in a place where the participants could be easily observed but where the observer could not be seen by the participants. The observer-position was shielded from participant view largely because of the way the spotlight effect worked in the room. The observation of people participating in this exhibition took place over several hours, and this, coupled with feedback and discussion, revealed some inconsistencies between the amount of time people believed they spent with the work (and consequently how engaged they were) and the amount of time they actually spent involved with the work.

In general, the participants underestimated the amount of time they spent initially interacting with the work—the time they spent working out how it worked and what it does. For example, during this time participants would test the effects of moving around in the room, moving with other people in the room, moving out of the projecting area (shadow-casting), moving backwards and forwards in front of the screen (casting longer and shorter shadows), and moving faster and slower. They would also try different combinations of movements to see what effects these things would have in the work.
Participants appeared to be uninhibited and ready to try out different combinations of movements in this quiet and darkened space. However, when it came to recording in writing or verbally discussing their experiences, participants tended to omit their early explorative and experimental arm-waving. If direct questions were asked to provoke memories of this behavior, the participants were often off-hand, disregarding or shrugging off this kind of activity, as if it were insignificant or irrelevant, or just ‘mucking around’ and not really part of interacting with the work at all.

There are different possible explanations that can be made for this difference between what the participants reported, and what the observer saw. Ethnographic studies of workplace interaction have often found that observation can uncover aspects of human activity that are passed over or ignored by the participants [11]. This can sometimes be because, when asked, people present idealized accounts of what they do, missing details of what actually happens. The detailed description of activity, which comes from the external perspective of an observer trying to understand the action as it unfolds, is one of the key strengths of ethnographic study.

Studies in proprioception—our sense of self in space [19] suggest that unless people are specifically keyed to remember their last specific movements, and there are no spatial memory triggers in place which allow purposeful, oriented movement during navigation—such as paths, landmarks, smells, [3] most of us will only be able to accurately re-trace the last three to ten seconds of our movement. Exceptions are people trained in movement—for example dancers or mime artists—who learn movement techniques, via kinesthetic sensory learning experience methods—in turn supported by visual and auditory learning cues. [21]

Recognition of the movements required in the early stages of ‘figuring out’ this work, then, is easily discarded. It is as though the moment participants ‘get the work’ (figure out mentally and physically how it works) then that earlier time they spent physically gesturing in the space prior to understanding loses all meaning. Thus they retain no active memory of this experimental period. Because participants act as though their interaction begins from the moment of understanding, there is a stronger tendency to dismiss the work as simple or as not sustaining engagement. This, however, belies the participants’ actual period of engagement with the work, which is substantially longer than they themselves believe. The first author had a similar experience and had left with the same impression.

5.3 Free play and imagination

In a variety of studies, researchers at LEGO Learning Institute have conducted research into the close connections between play, learning, and culture. In a study of parents attitudes to their children’s play and learning found that while parents acknowledge that play and learning are inter-related, a significant group of parents tend to prefer play activities that have a direction and/or purpose and tend to undervalue the sort of explorative imagination and reflection that often arise from ‘doing nothing’ or ‘free play’. As a result “free play is squeezed in with the competition with ‘goal oriented’ and ‘real world conforming’ activities” as “free play activities seem to clash with a late modern lifestyle characterized by increasing time and performance pressures among parents as well as their children.” [4] Flemmert Jensen indicates that parents acknowledge free play is crucial and when they are engaged children learn and grow, they “tend to feel that they have to prepare their children in the best possible way for adult work life… by enrolling their children in scheduled activities” (p. 10).

‘Free play’ is exactly the kind of interactive engagement that works such as Space of Two Categories require from their audiences. Haaslahi’s insistence on creating a non-competitive and largely unstructured environment for people to experience creates a sense of uncovering and discovery. We would argue the values found in these studies are indicative of attitudes to ‘free play’ in Western culture at large, in which ludic and non-competitive types of activity—while acknowledged as essential to our well-being—tend to be undervalued. An acknowledgement of this as a phenomenon may also go some way towards understanding the consistent dismissal of the initial gestural activities by our participants, as was witnessed as a discrepancy between the observations and evaluations in the exhibition.

The other aspect that needs consideration with this work and in the context of play is that it exists as a mixed reality work: an augmented reality, a physical space where a projected yet virtual child plays. Mixed reality is defined as “the merging of real and virtual worlds somewhere along the ‘virtuality continuum’ which connects completely real environments to completely virtual ones.” [14] So the world that the participants enter is one in which they are required to ‘suspend their disbelief’ and enter into the imaginary world of the young girl. In the feedback we received, we found that the participants in this installation had indeed engaged with the work, had indeed suspended disbelief. They entered a space of the imagination. Either the participants acted as if the installation they were inside was real or they switched repeatedly between the actual and the virtual—even without being cognizant of this occurring. The feedback shows us they readily do that, and that they have strong responses within this world as they stepped into the spotlight and performed to discover what existed there. We find two significant, polarized responses here: the first based on an engagement with the technology and the second based on an engagement with the content. In the first type of response, we see an engagement with the technology underpinning the artwork. Participants envision how it is working, test it, experiment with it. This in turn produces a flow of ideas around the technology. Participants who had backgrounds in IT or who were used to experiencing interactive artworks tended to question what else, technologically, could happen in the work. On the other hand, we find that another group of participants tends to reflectively engage with the content: with the child and her actions, her dancing, lying down, jumping up, smiling. This engagement may invoke childhood memories for some, and for others some kind of reflection upon the child state. For these participants, the technology is incidental rather than integral—relevant only in the sense that one must successfully master it in order to interact with the work. For these participants the technology need not be understood; indeed, understanding it or even acknowledging it might impinge on the surprise and the super-reality of the experience. Yet some responses sit somewhere between these two extremes or oscillate between these states during the process of discovery Either way, the augmented environment was ‘real’ as if there for our participants—no participant queried the ‘realness’ of the little girl—and they all exited having ‘had an experience’, and appeared to the observer to be in somewhat of a ‘heightened’ or ‘charged’ state.
6. CONCLUDING REMARKS
In this paper we have presented and discussed an evaluation of an interactive installation artwork named *Space of Two Categories*. We find that gesture and reflection appear to be linked in fundamental ways, and that ‘free play’ and gesture appear to be undervalued or easily dismissed by our participants. In our method we include the artist’s voice, to evaluate the ‘success’ of the work. We enlisted a specialist audience, who bring to the work their own predilections. We find that a regular gallery-going audience is more able to understand and engage with the imagery of reflective works; however, for many participants this interactive gestural work also produces a flow of ideas in and around the technology itself, which holds equal weight. We found that the audience readily broached the mixed reality aspects of the work, entered the ‘space of the imagination’ the work provided, and were present and engaged with the work ‘as if it were real’.

Most of the participants expressed some kind of surprise on seeing a ‘bubbly young girl’ in this work, and most refer to the work as ‘the little girl’, as if this is indeed the work’s name—so that the idea that the work is about ‘the little girl’ appears to be the lasting impression people retain of this work. This constitutes an active acknowledgement of the child as the one central identifiable (and human) component of the work. We suggest then that the artist’s intentions were ultimately successful here—whether or not they were actively, consciously, or reflectively acknowledged. We also suggest that the multivalent range of responses to Haaslahti’s *Space of Two Categories* indicates that bodily gesture successfully provoked active engagement and a set of human–centered responses for a diverse audience. We found that a multi-perspectival analysis of participant responses to this particular interactive artwork provided rich information that helped us better understand the reasons behind the variety of audience responses. This understanding was further enhanced by taking into account the backgrounds of those participants. We consider this information important in adding to this research on understanding and prolonging diverse ‘engagements’ in interactive art installations.

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8. REFERENCES