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17

interactions

being

Taking a (Design) Stance

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The purpose of this chapter is to show how designers position themselves, literally and figuratively, during design activity. We do so by analyzing the practice of design critiques. In the back and forth between students and discussants in a critique, the participants change their physical alignment, orientation, gesture, voice, and direction of gaze. These changes signal a shift in what Goodwin (2007) calls *stance*, "how participants mutually position their bodies toward each other and the environment that is the focus of their work" (p. 61). Through their stances, designers literally enter the world of their design artifacts and take a position with respect to their creation. Designs are not so much drawn or modeled, but inhabited. In inhabiting their designs, designers embody a form of imagining that Nelson and Stolterman (2003) consider the essence of designing: "the ability to imagine that-which-does-not-yet-exist, to make it appear in concrete form as a new, purposeful addition to the real world" (p. 9). In this study, we identify different stances designers take, and how these stances change in the course of design activity. We situate our work within recent design research that investigates, through the fine-grained analysis of speech-in-interaction, how designers discursively organize their activity (e.g., Murphy, Ivarsson, & Lymer, 2012; Oak & Lloyd, 2014).

Our chapter proceeds as follows. In the next section, we conceptualize the design critique as a site in which participants use their bodies to provide a frame for orientation and reference to one another and their objects of design. We then provide a detailed examination of speech-in-interaction and the accompanying semiotic resources used in one case study drawn from our data sources. We use this to identify design stances, demonstrating the movement from one stance to another. Following these, we discuss the implications of design stances for design education.

The Participation Framework of Design Critiques

Design critiques have long been recognized as important locations in which design activity and learning occurs. Emerging from the studio tradition in fields such as architecture, graphic design, and industrial design, design critiques are common elements in design education (Oak, 2000; Oh et al., 2013). Design critiques are also emerging in disciplines without studio-based pedagogical traditions, such as computer science (Hundhausen, Fairbrother, & Petre, 2011) and engineering (Regan, Dally, Cunniff, Zhang, & Schmidt, 2001). Common across the different disciplines in which they are used is a focus on discussions of designs that students have created mediated by inscriptions or artifacts. In addition to the student designer, participants in these discussions include one or more of peers, teachers, expert practitioners, and other design stakeholders (Oh et al., 2013).

Design critiques involve groups in interaction using their speech, bodies, and the material environment to frame their communicative activities. Using the same DTRS 10 dataset, Cardella and colleagues (2014) note how an instructor signals a design critique within a lab setting by his physical positioning in relation to the other participants. "Through directing his talk to and his bodily orientation toward all of the members of the immediate scene, he includes them in his design critique" (p. 15). This kind of embodied framing of people and materials in the environment occurs in a variety of settings of collaborative activity, and provides common ground for mutual attention, orientation, and reference, what is called a *participation framework* (Goodwin & Goodwin, 2004). During a design critique, students do not merely share, present, or tell about their design concepts. Rather, students *perform* their designs, making particular features of the design salient through coordinated speech, gesture, and gaze (Fleming, 1998). The design critique can thus be viewed as a stage on which the participants use a variety of semiotic resources that they create (e.g., speech, gesture, gaze) and that are present in the environment (e.g., projected images on a screen, concept boards, foam design models) for performative purposes. This kind of staging and performing is also characteristic of skilled lecturers in classrooms, who use their bodies to enact objects and processes around which the learning is focused (Pozzer-Ardenghi & Roth, 2010).

To investigate design stance, we analyze design critiques in both undergraduate and graduate industrial design courses from the DTRS 10 dataset (Adams & Siddiqui, 2013). The sources analyzed are audio-visual recordings of the design critiques of students in industrial design in which expert design practitioners are key participants. These were gathered in two different courses: one with undergraduate students at the junior level, and the other with graduate students. The dataset contained recordings of design critiques of seven undergraduate students presenting to expert design practitioners, ranging in length from 4 minutes 52 seconds to 7 minutes 14 seconds, and five graduate students presenting to expert design practitioners, ranging in length from 8 minutes 49 seconds to 15 minutes 14 seconds.

The participation framework differed between these two courses. For the undergraduates (Figure 1), the framework includes the bodies of the student presenter at

the front of the classroom and the expert design practitioners sitting nearby on the other side of the table facing the student. The primary objects of discussion are on the table, which serve as a staging area for mutual orientation. These include foam models as well as three boards containing design drawings that face the practitioners. For the graduate students, weather conditions prevented the two professional designers from being present in the same room as the students, leading to a different participation framework than that of the undergraduates. The student being critiqued was at one location (Figure 2) in front of a table that contained a computer, large storyboards illustrating design concepts, and a telephone through which the student talked with the remote designers. In addition, a second student sitting beside the presenting student took notes on the interactions, but did not otherwise participate in the design critique. The professional designers were collocated at a remote location, with a telephone and computer. The presenting student used the computer to display a sequence of images representing the student's design concepts, which were also displayed on the designers' remote computer. The participation framework is bounded by the student presenter's body, the laptop in front of her, the storyboards with the design concepts on the

Figure 1: Undergraduate student design critique.

Figure 2: Graduate student design critique.

table, and the telephone on the right providing a link to the bodies, telephone, and computer of the remote critics who complete the frame. Audio-visual recordings of these critiques include only the student site.

Design Stances

In this section, we provide a detailed description and analysis of one illustrative case that demonstrates the shifting stances of the designers that we identified. In the sources analyzed, we identified four stances taken by both student and professional designers: the *inscriptional*, *first-person, third-person,* and *phenomenal* stances. Each stance is defined by the way in which designers position themselves—through speech, body orientation, gesture, and gaze (Roth & Lawless, 2002)—with respect to the artifacts (inscriptions and material things) and enclosing participant framework. During a design presentation and critique, a designer may move through a progression of these stances.

We exemplify these stances using a case study drawn from the design critique involving Mylie.[1] Mylie was a student from the graduate course, whose design brief called for students to "explore the laundry process for homeowners, specifically focusing on the laundry procedure outside of the 'laundry appliances.' They [students] will develop concepts and designs that help enhance the experience." Filling the display of the laptop in front of Mylie is an image of a design concept that she is discussing. The centerline of her body is at the right-hand edge of the laptop. Between the phone and the laptop, but a bit behind each is a large sheet of paper that contains the left half of the image displayed on the laptop but at approximately double the size. Mylie's body and head are oriented to the paper image. Much of this image is the drawing of a compartment that looks like a closet, with large blue arrows into and up the "closet."

After a brief (22 second) introduction summarizing what she will be discussing, Mylie begins to articulate a design concept called the *Breezer,* a term she has placed in the top-left corner of her design image. The Breezer was motivated by research that Mylie did earlier indicating that people often have clothes that they want to wear multiple times and are not ready to wash. Her concept is to have a place to put these clothes. The speaker throughout the transcripts is Mylie (Figure 3).[2]

Mylie focuses the critics on the "compartment," comparing it to a closet, not in its location ("it can be located anywhere") but in its "function." As Mylie speaks, she orients to the paper image, grazing the top of the image with the fingers of her open left hand, moving it back and forth. Her gesture places her "on the inscription," synchronized with her discussion of the artifact's function that she is designing. Drawn in perspective in two dimensions, this image depicts a scenario of artifact use within the larger ecology of the home, with the Breezer compartment placed inside a walk-in closet, clothes hanging just outside the Breezer and a person opening a drawer nearby. The drawing is not only annotated with details of the design to be made salient (e.g., "the bottom is a SHOE RACK"), it also includes notes from her research that motivate the design ("this box is for the clothes which I wear once or twice but still don't need to wash") and the larger design purpose

("to maintain the cleanliness of daily clothes and prolong their lifespan"). This inscription, then, can be viewed as a symbolic abstraction representing her larger design concept, and her gesture in relation to it indicates her positioning within this abstract space.

In this part of her presentation, Mylie's orientation is determined by the two-dimensionality of the design drawing. Her hand gestures point to or follow the traces on the paper or computer screen. In the same way that research has identified physics (Ochs, Jacoby, & Gonzales, 1994) or environmentalist presenters (Roth & Lawless, 2002) as metaphorically journeying through the inscriptions, Mylie takes her audience, the two design critics on the other end of the telephone line, through the two-dimensional space she has created and made available to them. Because of this determination of events by the inscription, we denote the stance taken as the *inscriptional stance*. In this stance, the designer orients and makes reference to sketches and diagrams, whether projected on the screen, printed on paper, or displayed on a computer monitor. The inscriptional stance orients "to the page," which generally abstracts or "filters" a number of design features so that only particular characteristics of the design (such as shape and form) are made salient (Lim, Stolterman, & Tenenberg, 2008). This orientation is signaled by verbal reference to parts of an inscription, deixis or gaze orientation to an inscription, and/or moving the hand over or in relation to an inscription.

As she continues in the next utterance, she moves off the page and into a three-dimensional space. Throughout the six seconds of fragment 1 illustrated in utterances 3–6 (Figure 4), Mylie iconically gestures with her left hand. Her left hand moves from the center of her body (utterance 3) up and outward in a vertical direction (utterance 4), mirroring the vertical blue arrow in her drawing that represents air moving up the interior of the Breezer compartment. The hand continues in a movement back to her body (utterance 5), setting itself up to produce the outward movement (utterance 6) that corresponds to the outward movement of the air she simultaneously describes. At the same time, this gesture is coordinated with her narration about "the air" that "slides . . . through the closet." Inscription, gesture, and speech are thus all coordinated so that her hand and arm

Figure 3. Fragment 1: transcript of Mylie's utterances 1-2.

1. so to kind of (.) ha (.) facilitate for that um (.) here is uh (.) uh (.) a compartment uh idea mm at the moment its kind of um (.) uh (.) like a a closet function so it can actually exist either in the (.) in the hallway or in a in a walk-in closet or (.) so it can be located anywhere (.)

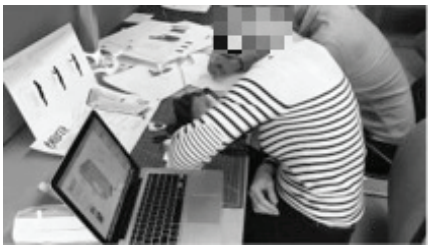
2. ((moves index finger of left hand to point to bottom arrow on the paper drawing))
but the function is (.)
((moves hand along bottom of paper))

can be seen to enact the airflow. They embody not the compartment itself, but make iconic the dynamic interaction with the physical world that this artifact sets in motion and which is its essential property. With this gesture, Mylie takes the kind of perspective that a person (such as the one illustrated in the right-hand side of her concept sketch) might have when viewing the Breezer, from the outside looking in, the perspective of a person who might approach and hang or retrieve clothes from the Breezer. From Mylie's seated position, she can simultaneously view her paper drawing on the horizontal surface of the desk, the digitized image on the nearly vertical surface of her laptop screen, and her hand and arm in front of her body moving in three-dimensional space. The design, then, is "out there," in front of her, while she stands at the edge of the frame looking in.

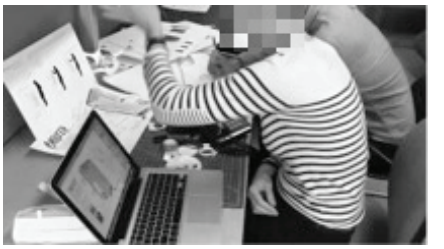
In this part of her presentation, Mylie is performing her design in a way that it appears before and independent of her. De facto she is taking up a position with respect to her design that is typical for the hard sciences and the relation of scientists to their ob-

Figure 4. Fragment 2: transcript of Mylie's utterances 3-6.

3. uh effectively that it pulls air in (.)
((draws her left hand closer to her body, closing her fist))
and slides it
((opens hand and moves it in an upward trajectory roughly parallel to her body))



4. through the
((completes her trajectory at head level, palm outward))



5. (.) um (.) through the closet an:d
((moves left hand back toward her body))

6. out
((moves open hand upward as before, palm facing outward))
at the top

ject: it is a *third-person stance.* In this stance, the object exists separate from the person creating it. This stance goes beyond the page, entering into the three-dimensional world. It concerns what can be seen in front and at a distance, impersonally, as anyone might see while looking at a design. Vision is the primary sense invoked, often with verbal reference to properties of size, shape, material, or physical forces and constraints. Gesturally (as we see in other cases, e.g., Figure 1) participants point at the three-dimensional foam models on the table in front of them, or handle the artifacts while making verbal reference to them. The third-person stance is also gesturally identified as the "observer" viewpoint: when "the hand(s) represent one or more of the entities in the narration" (McNeill, 2005, p. 34), such as Mylie's use of her hand to represent the air.

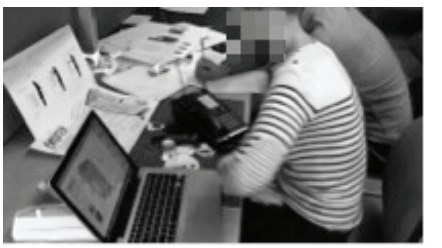
Mylie continues with her description, and in so doing changes once again her positioning with respect to her design and its interaction with the world (Figure 5).

Figure 5. Fragment 3: transcript of Mylie's utterances 7-10.

7. (.) so that the clothes
((moves left hand in toward her body, palm inward, in a circular motion))
would get

8. a strong airflow
((hand moves rapidly up alongside her torso))

9. and (.) uh (.)
((hand moves rapidly down alongside her torso))



10. ((hand moves rapidly up))
help them kind of
((repeats the downward/upward movement of her hand))
breeze out

In fragment 3, illustrated in utterances 7–10, Mylie's left hand moves toward her body, outside of or at the far left periphery of her field of view. In its up and down motion, the hand continues to represent the "strong airflow" within the Breezer. In the movement visible from utterance 7 to 8, the left hand/arm combination stays close to the body. The hand/arm then quickly moves downward (utterance 9), thereby setting it up for showing the movement of the air through and out of the Breezer (utterance 10). This final movement quickly repeats itself.

In contrast to fragment 2 (utterances 3-6), Mylie's movement of her hand close to her body draws her body into the participation frame in which she stages her design performance, bringing her into a new relationship with her design. Through her body positioning relative to the breeze that her hand represents, her clothed torso acts as the clothing that is to hang in the Breezer. At the same time, her head and body enact the role of a human user who wears clothing (i.e., the clothing that she herself wears and that she references in her hand movement alongside this clothing) to hang in the Breezer. This *first-person stance* is distinguished from third-person stance by where the participant locates himself or herself with respect to the borders of the staging area in which the performance takes place. There are two fundamental locations for purposes of categorization: inside or not inside. In first-person—or what McNeill (2005) calls "character"—stance, "the speaker him/herself is inside the gesture space" (p. 34). By contrast, in third-person stance the participant locates himself or herself on the border or outside the frame in which the performance is staged. Touch or "feel" is the primary sense that is verbally invoked to signal first-person stance. Participants signal their insideness with the orientation and placement of their entire body relative to their hands and the larger frame of action, taking on the role of a person who is using the envisioned artifact, or animating some part of the designed artifact.

Mylie, however, does not simply take a first-person stance, for, while her body is now inside the frame, her hand continues to enact the breeze as it had in third-person stance. In some senses, in the totality of her gestures with respect to her body and her coordinated speech, she combines third- and first-person stances to become the whole system, the whole phenomenon in which she is trying to design: Breezer, air, clothes, person, all in a windy flux. She is no longer looking in from outside the frame, but is now inside, inhabiting the phenomenon even as she brings it into being. Her words "breeze out" reinforce this totality in turning "breeze" into a verb while at the same time combining this verb with "out" to make a pun: the Breezer breathes the clothing contained within. In appropriating her own clothed self in her enacted display, she references both clothing and wearer at the same time. In so doing, she connects to the very reason for this Breezer design: people "breathe in" the scents of the world into their clothes—in the perfumes they wear, the sweat they secrete, the earthy landscapes they traverse, the curried kitchens they socialize in—which they can now "breeze out" in Mylie's designed compartment. In her coordinated speech and gesture, there is no longer a distinction between the person and the design. She becomes the breath and wind that Ingold (2011) speaks of: "[T]o live we must be able to breathe. Wind and breath are intimately related in the continuous

movement of inhalation and exhalation that is fundamental to life and being" (p. 139). In inhalation, wind becomes breath; in exhalation, breath becomes wind. As a result, "the wind is not so much embodied as the body *enwinded*" (p. 139). In this stance, combining first-person and third-person stances, the designer becomes the entire design phenomenon: object, person, and context, so we call it the *phenomenal stance*. This is generally done when the hands animate some part of the design in use indicating third-person stance while the torso and/or head animate a person using the design.

From the start of Mylie's first gesture (utterance 2) enacted above the inscription until her final gesture alongside her body (utterance 10), 14 seconds elapse. During this time, she traverses sequentially through three distinct design stances, three ways of positioning and being positioned with respect to design and the lived-in world: first, oriented toward the abstract inscription, then lifting off the page into an objectivized third-person view, and finally becoming the entire design phenomenon. Designing and presenting design are not characterized by a single stance; instead, the design is alive in the fluidity of the design performance through the different design stances, each adapted to manifesting a different aspect of and perspective on the design.

Discussion

In this study, we investigate the different stances designers take during design critiques. Design critiques involve normative requirements for communication by the participants, that is, that the students present their design mediated by inscriptions or models to which critics respond. The critique, then, provides a natural setting for participants to make visible their own stances in relation to one another and the design under discussion. Participants in design critiques not only tell about designs, they bodily display for one another different ways in which a designer can position himself or herself in relation to a design, different perspectives that each can take with respect to a design.

Do designers take stances outside of the design critique, during other kinds of design activity, whether in social settings or when designers work alone? In discussing the social origins of mind, Vygotsky (1978) theorizes that all higher order mental functions of individuals begin in the social sphere. What is enacted and symbolized in interpersonal activity and communication is subsequently internalized by individuals, serving as resources for the individual to draw upon in subsequent activity. Similarly, Tomasello (2014) notes how human cognition has evolved so that social communication is generated and interpreted through perspective taking, that is, perceiving the same scene from different viewpoints. "[B]oth participants in the communicative interaction must represent one another's perspective in the situation and its elements. . . . The communicative act thus perspectivizes the scene for the recipient. It also perspectivizes the elements" (pp. 56-57).

Drawing on this theory, we conjecture a movement from the social sphere of design activity such as design critiques, where design stances are publicly displayed and socially produced, to the individual designer, who internalizes and appropriates these stances for his or her own design activity. These stances then serve as internal resources

that can be externalized during further social encounters so that there is an iterative and ongoing dialectic between the individualization and social reproduction of these stances. We thus view stances as enacted not only during design critiques, but as an essential aspect of the entire process of designing. In short, designers *always* take a stance, always position themselves with respect to their designs and the context in which these designs will be used. And they use these stances as cognitive and communicative resources, so that correctly interpreting the stances taken by others requires discussants in a design conversation to take on and mirror one another's stances.

If design stances are ways of being in the world, they can serve as resources that design educators can create and draw upon in the design and enactment of instruction. For example, the very design stances that instructors take with respect to their students and that students display to one another are important features of the instructional environment. Teachers not only can demonstrate the visual properties associated with external forms, the objective viewpoint from arm's length, but they also can inhabit and display the first-person stance, the up-close feeling of a design, the embodied experience of use. Not only are words and artifacts available for students to perceive and appropriate, but also the gestures and body positions that teachers and other students enact become important resources for subsequent design communication, activity, and cognition.

Historically, this attention to the first-person bodily experience of design was an important feature of the design education introduced by Johannes Itten, a member of the Bauhaus. "Itten himself incorporated physical exercises into his courses, and required his students, for example, to swing their arms and bodies in circular movements before attempting to draw freehand circles. He and other tutors also encouraged tactile perception and the construction of collages from randomly collected junk and other materials" (Cross, 2006, p. 24). Circles are not just shapes that the eye sees from a distance, but are traversals that people move through and around. With a pencil and paper, the hand must move in a circular pattern in order to create a circular mark on paper, so that the inscribed circle represents the physical motion required to produce it. But with digital drawing tools, this analogical link between the body movement and the produced inscription is abstracted, so that the movements of the body in creating inscribed shapes need bear no direct relation to the shape. The body, we suggest, needs to be drawn back into the relationship between designers, their designs, their prospective users, and the world. And design critiques and conversations, where designers perform their designs for one another, provide a natural setting for this first-person experiencing of design to occur.

This first-person experience also is advocated by Buchenau and Suri (2000), who suggest that the process of building conventional prototypes may not be sufficient for designers to understand and explore the design space in which they are working. The authors propose that designers themselves carry out *experience prototyping.* "By the term 'Experience Prototype' we mean to emphasize the experiential aspect of whatever representations are needed to successfully (re)live or convey an experience with a product, space or system" (p. 424). Experience is subjective and multimodal. The authors also suggest that

> it depends upon the perception of multiple sensory qualities of a design, interpreted through filters relating to contextual factors. For example, what is the experience of a run down a mountain on a snowboard? It depends upon the weight and material qualities of the board, the bindings and your boots, the snow conditions, the weather, the terrain, the temperature of air in your hair, your skill level, your current state of mind, the mood and expression of your companions. (p. 424)

Buchenau and Suri (2000) provide several examples of first-person experiences that designers on their team created for *themselves* in order to better understand their design phenomena: their distribution of pagers to the entire design team that went off at random times so that the team could imagine and talk through what it would be like to have a surgically implanted defibrillator around which they were designing; and their use of a foam core simulation of the interior of an airplane along with everyday props such as chairs and coffee cups to carry out a number of activities that passengers might want to do, such as reading, sleeping, and eating, to give them insight into the design of an airplane interior. Prototypes are not just external forms to be visually perceived by the designers, where the experience of use is something that happens later, by others. Rather, in experience prototyping, prototypes are to be brought close and inhabited by designers as a key part of exploring the design space.

What we suggest, then, is that the very instructional forms that design educators use can evoke different stances. These forms of instruction, such as presentations, discussions, descriptions, design problems, and so on that constitute the instructional materials and design, include sociohistorically sedimented representations that students are often required to use for making design activity manifest. In the cases examined from the data corpus, these representational forms include two-dimensional sketches captured in concept boards and three-dimensional foam models. In requiring these particular representational forms, the instructor helps the student designer to take on the inscriptional and the third-person design stances. At the same time, the predominance of these forms, and their use at particular points in the design cycle, imply a privileged status for the inscriptional and third-person stances over the others identified. In addition, the use of these forms and their corresponding stances implies a tacit understanding and therefore a tacit pedagogy for how a designer uses these forms and stances for moving along a design trajectory: first inscriptional, then a low-fidelity form (such as foam models for industrial design), then higher-fidelity mockups, through to a final design. This trajectory can be seen in many treatises on design. For example, Nelson and Stolterman (2003) suggest that "[d]esign is a process of moving from the . . . general and universal to the *ultimate particular*—the specific design" (p. 33). Similarly Dym and Little (2004) provide a prescriptive model for design that moves from conceptual design to preliminary design to detailed design to final design.

Despite their many virtues, sketches, foam models, and other low-fidelity representational forms often do not capture the *experiencing self* in direct contact with the envisioned design required in the first-person and phenomenal stances. More so, the involved designer is not imposing a design on the world but coevolves with the design

(Ingold, 2013). It is in working with these different materials that the designers "become-design." What we observe in following Mylie is a process of becoming-Breezer, where Myle and Breezer are opposites across from and transverse to the flow of becoming. Consider, furthermore, the design brief for the undergraduate course, to design "impromptu seating" for private offices, shared workspaces, breakout areas, or lounges, "accessories that can bring excitement to the office." During their critiques, each of the seven students presents multiple images of products that currently exist on the market, often making verbal reference to the visual sensory mode, as in "when I looked at . . . what you guys are all about some of the products you have and then I took a look at the competition" (Albert) and "I looked for some products that were made by the competitors" (Lana). What none of the students report is any experience that they themselves had, either in the past or as an explicit aspect of carrying out their current design activity, of sitting on different kinds of furniture. How will they know how different heights, materials, shapes, and sizes affect the experience and afford or hinder the activities one might do while sitting, such as writing, dozing, reading, talking, or working, if they do not take these experiential stances? May this be one of the unutilized dimensions in design education that has repercussions for the kinds of objects that we use in everyday life, including, for example, tea pots that inherently drip when pouring a cup, chairs that never feel comfortable however one sits, or stove tops where one never seems to go to the right dials?

This is not to suggest that visual forms are inherently unsuited to evoke the first-person or phenomenal experience associated with particular designs. For example, in one of the design critiques from the data sources analyzed, in commenting on one of the student designs projected on the screen at the front of the room, one of the expert critics moves from inscriptional, to third-person, to phenomenal stance within a span of five seconds. Particular design representations, however, such as the sketch and the three-dimensional model, appear to predispose a designer to particular stances (inscriptional, third-person). Instructors have a key role in evoking a variety of stances implicitly through the design artifacts that they ask students to produce.

The experiencing self, as represented in the first-person stance, may also be an important resource that designers use in developing empathy for the people for whom they design (Fila & Hess, 2014). In their analysis of the data from DTRS 10 (Adams & Siddiqui, 2013), Fila and Hess draw from Batson's (2009) enumeration of eight different senses of empathy, including "(b) Adopting the posture or matching the neural responses of an observed other, (c) Coming to feel as another person feels, (d) Intuiting or projecting oneself into another's situation." Empathy is not simply affective, but embodied as well, so that the designer positions herself to mirror another—in fact, bodily position is constitutional to affect (e.g., Damasio, 1999). The designer uses a first-person stance as a means for developing a "feel" for an anticipated user's experience. Thus, when instructors are able to evoke and scaffold students into taking the first-person stance, they are at the same time cultivating the prerequisites for empathy.

The phenomenal stance extends beyond the first-person stance. In the phenomenal stance, the designer not only takes on the first-person stance, they do so without relinquishing the third-person stance; both occur at the same time. For Merleau-Ponty (2000), this hybrid stance is a basic condition of human life: "man is simultaneously subject and object, first person and third person, absolutely free and yet dependent." Tenenberg (2014) conjectures that this hybrid first-person and third-person stance is associated with learning through observing the practice of others. When Mylie first uses her hand to enact the airflow within the Breezer, she positions herself outside the Breezer looking in. When she then moves her hand alongside her body, she positions her torso within the Breezer to become both clothing and the wearer of clothing, while at the same time using her hand movement to continue to enact the airflow. In this hybrid stance, Mylie straddles the conceptual frame, both inside and outside at the same time. She has, in that moment, become the entire design phenomenon that she is designing: not simply Breezer or airflow or clothing, but clothing-enwinded-in-the-Breezer.

In inhabiting this stance, Mylie positions herself *as* a designer. "Being a student is generally best described neither as finding innate abilities in oneself nor as acquiring a mass of facts about the world. Instead, being a student on Heidegger's account is learning how to go about in the world a certain way, for instance, as a physicist or as a philosopher, where who one is and what one does are inseparable" (Hoy, 2006, p. 184). Becoming a designer is not so much an acquisition of expert knowledge as much as it is a movement of the designer along a trajectory of becoming. This overall trajectory consists of many experiences of becoming-design. In that process, both designers and their designs are formed, each leaving a material trace in the other. That process of becoming-design is orthogonal to the connection between maker and object-made, between designer and design (Deleuze & Guattari, 1980; Ingold, 2013).

Conclusion

Design stances are made publicly available and signaled not only by the spoken expression of different viewpoints, but also in the accompanying body gesturing and orientation. We identify four distinct stances that designers display, which we characterize as *inscriptional, third-person, first-person,* and *phenomenal.* These stances represent relations that designers establish between themselves and the objects that they envision. In the inscriptional stance, the designer orients to, points to, or verbally references a sketch, concept board, or display on a monitor or projection screen. In the third-person stance, the designer moves off the page and into a three-dimensional world, locating the design as a visual object in the space in front of him or her, visible to her and others in the participation framework. Foam models are grasped and pointed to, visual properties are verbally described, hands perform iconic gestures in the space in front of the body. In first-person stance, the designer describes the tactile and proprioceptive characteristics

of a design, or moves inside the participation framework, incorporating their own body proper or head in iconic gestures mirroring the actions of a human user or animating "from the inside" some aspect of the designed object. And in the phenomenal stance, the designer inhabits both the third-person and first-person perspectives at the same time, and in so doing communicates the entirety of the design phenomenon: object, person, context, and interactions among these.

What makes these different stances possible and communicable to others is the designer's material body. In physical stance, orientation, gesture, speech, and gaze, a designer positions themself in relation to the conceptual space of the object under design, shifting from one stance to another throughout a design performance. Designer's bodies are thus central to design, part of the process by which designers "imagine that-which-does-not-yet-exist, to make it appear in concrete form as a new, purposeful addition to the real world" (Nelson & Stolterman, 2003, p. 9). Part of this is mentalistic activity, a "designerly way of knowing" (Cross, 2006) that can be externalized in design sketches and physical prototypes. Yet these design artifacts do not stand on their own; meaning is not immanent in the inscription and artifact. Instead, in the inscriptional and third-person stances designers use the dynamic physicality of their speech, gesture, gaze, and body to *augment* the design artifacts, bringing them to life in ways that are difficult to represent in the artifacts themselves. This meaning-in-action is heightened in the first-person and phenomenal stances, in which the designers "become" the design concept, bringing its physicality and behavior through time into their bodies as they experience and explore the relationships between the characteristics of the design, the surrounding context, and the imagined user. To reason about how a user experiences a design characterized by its materiality (which includes digital products with user interfaces) requires becoming-design, a process that comes with empathizing with the experience of the user interacting with the design. At the same time, the objects and materials of design have to be apprehended at sufficient remove so that they can be manipulated, conjoined, split apart, and shaped so as to bring about designers' intentions. This allows designers to rapidly explore the dimensions of the design space, get a feeling for the experience, and reason about how changing characteristics of the design might influence users' experiences of the design, as the designers move from one stance to another.

Stances are not simply personal and private. Design critiques are performances in which designs are performed on a stage that includes both traditional design artifacts such as inscriptions and models, and the physicality of the designers' bodies, speech, gesture, and gaze as the designers individually and collectively shift among stances in order to reason about the design. In their enactment through gaze, gesture, movement, and orientation, stances are social signals that thereby become resources through which designers provide others with different perspectives on the same design. Even a subtle change, such as a simple movement of the hand or head, can change the designer's stance or what is inside or outside the common frame of reference with other participants in a design conversation. As a result, teachers can help students to take a range of design stances, each representing a different relationship that students have with the

same design. This can be carried out through the very stances that teachers and students display to one another when discussing designs, and in the activities and representational forms that teachers ask students to undertake and use. There is no perspective-free way in which to design, designers always take a stance, so explicating these stances, and drawing the body back into the relationship between designers, their designs, their prospective users, and the world, may help students become better designers and more effectively navigate design discussions such as design critiques.

Notes

1. This and the other names of participants in the design critiques are pseudonymized.
2. We use the following notational conventions for the transcripts, standard in conversation analysis (see as well Appendix A of Roth, 2013). Unless modified, all words are written with small letters. A period in parentheses indicates a pause of greater than 0.1 seconds in length. Descriptions in double parentheses are transcriber's comments. Colons indicate lengthening of a phoneme, about 0.1 second per colon. Square brackets in consecutive lines by different speakers indicate overlap of speech between these speakers. Speech within angle brackets preceded by "p" (or "pp") standing for "piano" (or "pianissimo") indicates lower (or much lower) speech volume than normal, as in "<<pp> scavenger hunt>." Speech within angle brackets preceded by "len" (or "all") indicates *lento* (or *allegro*), i.e., slower (or faster) than normal speed. A word inside parentheses ending with "?" indicates difficulty in hearing the word on the recording and that the word in parentheses is the closest approximation. A question mark inside a parenthesis is a word that could not be approximated. Capital letters indicate speaker's emphasis. An equal sign at the end of a word indicates that there is no hearable pause prior to the next word uttered. Downward and upward arrows indicate the pitch jumping downward and upward. The punctuation marks ",?;." indicate movement of pitch (intonation) toward the end of an utterance: slightly and strongly upward, slightly and strongly downward, respectively.

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