8
Self-Evidence: A Non-Alienated View

"The current views of 'truth' are alienated views; they cause one to lose one part or another of one's self and the world… my purpose is to sketch the leading ideas of a non-alienated view."

Hillary Putnam[1]

"When I was observing issues of wholeness and life in a thing, I did not try to observe things as if I myself did not exist."

Christopher Alexander[2]

8.1 Introduction

This chapter analyzes, evaluates and critically reflects upon the three case studies *as a whole*[3], summarizing their contribution to the thesis objectives. Within the heart of these objectives is the hypothesis that *self-evidence* is a critical component of a non-alienated view of technology design. The concept of *self-evidence* invites a re-thinking of the process of design for technology, one that includes design for the experience of the self. Supported by concepts of somatic phenomenology and discourse surrounding 'felt-life' within HCI, the case studies articulate the concept of self-evidence through the application of somatic body-based practices as a resource for technology design within HCI. The case studies share a central proposition that experience within interaction is not only *given* but also *enacted* through the participation of the user. Including affordances for self-experience and self-awareness *within* technological design brings an ethical dimension to the assessment of technological systems within HCI. By engendering a role for cultivating self-awareness within interaction, our digital technologies can support the development of an *attentional skill-set* for experience.

[1] Putnam, H. (1981), op. cit., p. xi-xii.

[2] Alexander, C. (2002), op. cit., p. 352.

[3] The three case studies *whisper*, *exhale* and *soft(n)* are described in Chapter 5 From the Inside Out [whisper], Chapter 6 Designing with Breath [exhale], and Chapter 7 Toward a Somaesthetics of Touch [soft(n)]

Viewing experience as a skill that can be evolved, is an epistemological framing that is central to somatics practice[4]. In *Personal Knowledge*[5]*,* Michael Polanyi uses the concept of *indwelling:* the application of experiential skills within our use of tools and technology. Polanyi describes the way in which we 'share a field of experience' by extending ourselves into our tools and technologies. Polanyi's concept of indwelling exemplifies the connection between an experiential self-evidence leading to a non-alienated view of technology design:

> [the tools] can never lie in the field [outside ourselves] … they remain necessarily on our side of it, forming part of ourselves, [as] the operating persons [in our creation of technology]. We pour ourselves out into them and assimilate them as parts of our own existence. We accept them existentially by dwelling in them.[6]

This chapter discusses insights gained from applying somatic practice to the design of technology, and describes how these design processes can be operationalized as a resource within an HCI context. Among these resources, is the practice of somatic connoisseurship, and the significance of 'somatic facilitation' as a role within a technological design process that is shaped by somatic sensibilities. This chapter synthesizes data extrapolated from the case studies creating an argument for the inclusion of somatic awareness within an interdisciplinary framing of HCI. Finally this chapter summarizes case study data through a comparative analysis of design process that evaluates assumptions, methods and outcomes: the self-evidence that results from these case studies as a whole.

Central to this thesis is the inclusion of self-evidence and the non-alienated view of technology design in which the *self*, embodied within the multiple roles of researcher, designer, artist, and participant or user, is included in the methodological structure of design for technology, both as design goal and as design process.

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[4] The concept of *experience as skill* has been described in detail in Chapter 2 Embodiment in Somatics and Performance.

[5] Polanyi, M. (1958). *Personal Knowledge: Towards a Post-Critical Philosophy*, Chicago: University of Chicago Press, p. 59.

[6] Ibid.

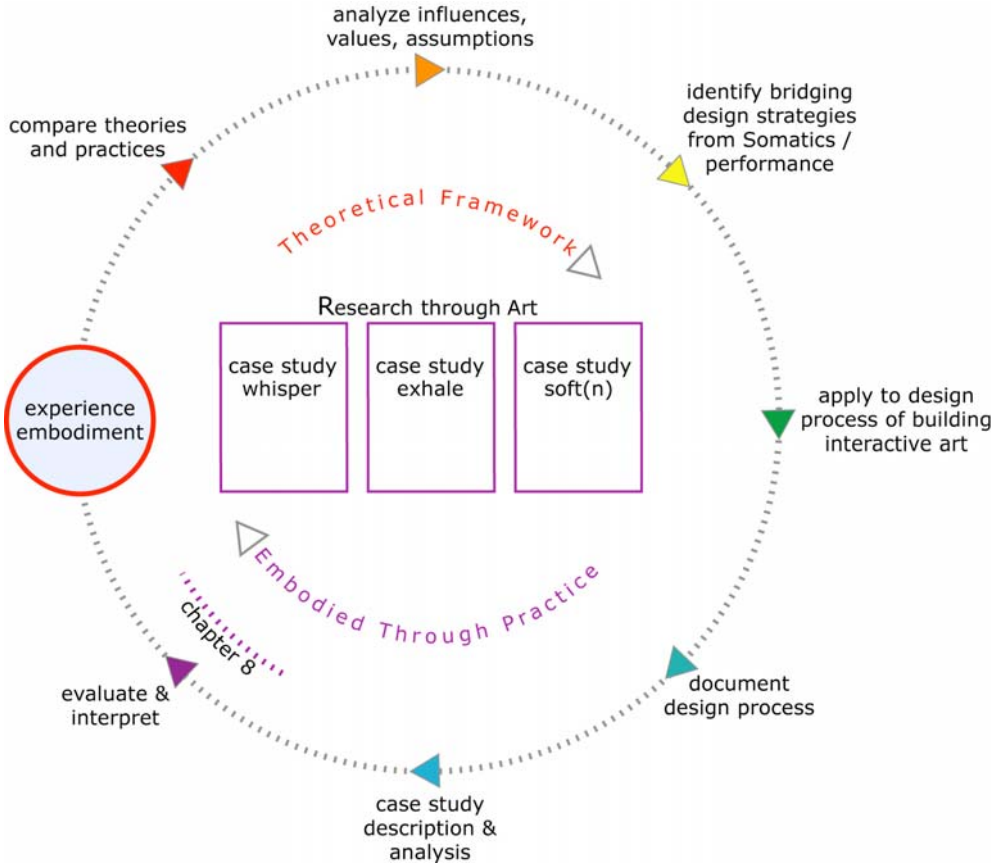

Figure 100: Analyzes, Evaluates and Interprets Case Studies as a Whole

These three case studies taken as a whole are intended to illustrate a breadth of somatics approaches and techniques applied to the technology design cycle within HCI. The case studies *whisper* and *exhale* outlined in Chapters 5 and 6 provided examples of the application of somatic techniques exploring body-state and breath. In these examples somatic techniques were applied to the early stages of technology design in which concept exploration and realization were generated from participant's exploration of felt experience. The third case study, *soft(n)* also incorporated early design exploration based on participant experience workshops and technology prototyping. However, the case study analysis of *soft(n)* in Chapter 7 focused on the application of somatics knowledge to a functional computational model for technological implementation, which illustrated an approach that embeds somatic knowledge within a computational model in the design process.

Chapter 4 Bridging Methodologies, introduced the case studies through their contribution to design activities, and focused on describing design exploration within a design lifecycle. Daniel Fallman[7] has noted the link between design exploration and artistic practice.

> …design exploration is a way to comment on a phenomenon by *bringing forth an artifact* that often in itself, without overhead explanations, becomes a statement or a contribution to an ongoing societal discussion. In this way, the activity of design exploration is clearly linked to some of the ideals of contemporary art, as well as to the interpretative attitude of many humanities disciplines.[8] [Italics mine].

Although each of the case studies *brought forth* an artwork as artifact, that artifact is more appropriately understood as an 'artifact of experience' generated by the conditions within the technological design of the art installation. The case studies also simultaneously brought forth an 'artifact of design process' in which Polanyi's concept of indwelling is articulated in the design of technology. The indwelling of experience in which we "pour ourselves out into our technologies and assimilate them as parts of our experience"[9] resonates with the design explorations of these case studies. The concept of indwelling synthesizes the notion of artifact as experience where subject and object intersect. This chapter expands upon the examples introduced in Chapters 5, 6 and 7 providing analysis and context regarding somatic facilitation and collaboration. Each case study applied a variety of somatic techniques within a design exploration process.

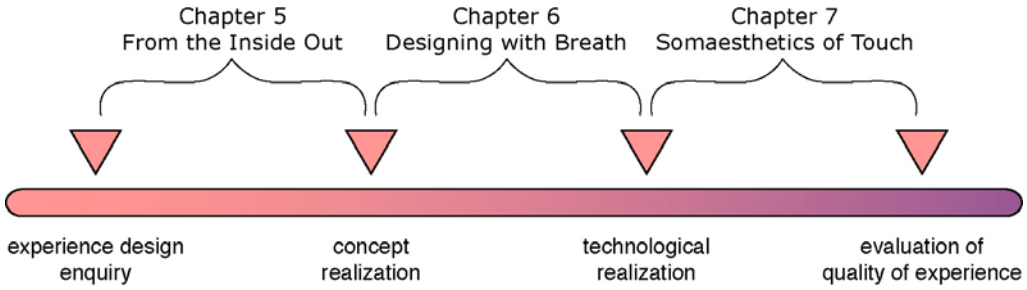

Figure 101. A Variety of Somatic Techniques applied to Different Stages of Design Process

[7] Fallman, D. (2008). The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration, *Design Issues*, *24*(3), Cambridge, Massachusetts: MIT Press, p. 4-18.
[8] Ibid, p. 8.
[9] Polanyi, M. (1958), op. cit., p. 59.

8.1.1 Contextualize Research Strategy within Thesis Objectives

The research strategy is based on an overarching process of research through art that has explanatory value with the HCI community in the context of design for embodied interaction. The proposition is that if technology can be used to create a space for the experience of *self-awareness,* thereby providing a source of rich interplay between movement and sensory expression, then our technologies can support self-cultivation through the development of our *skills of experience*. Shared ambient technological spaces can create affordances for 'attending to' our state of being. The comparative case study analysis of the whisper, exhale and *soft(n)* installations enables a rich variety of somatic body-based techniques to be evaluated in the context of this proposition. This chapter provides a comparative analysis that articulates this proposition through the practice of somatic connoisseurship within a design process, and an evaluation of assumptions and values based upon self-evidence that results from these case studies as a whole.

8.1.2 Case Studies Contribution to the Thesis Objectives

The propositions, design exploration and evidence gathered from the case studies has followed from an inquiry based on a set of research objectives derived from the research questions outlined in Chapter 1. These are summarized to frame the discussion that follows. These objectives are to:

1. Illustrate the application of body-based somatic practices within an HCI context in order to expand the practical application of embodied theory and its application to technology design, particularly in its use as a design resource within HCI.
2. Enhance a reflective space for ethical valuation of technology design within HCI through a radical interdisciplinary approach utilizing ameliorative properties of first-person methods of somatics and contemporary dance.
3. Reframe user experience within HCI and between HCI and somatics through an articulation of the epistemological nature of body-based somatic practices.

8.2 Connoisseurship: the Role of Somatic Sensibilities in HCI Collaboration

The practice of somatic connoisseurship highlights the significance of *somatic facilitation* as a role within the technological design processes. The role of somatic connoisseurship can enrich interdisciplinary design space and bring new knowledge and new practices to the design of technology within human computer interaction. In *The Enlightened Eye: Qualitative Inquiry for the Enhancement of Education*, Elliot Eisner describes connoisseurship as the art of appreciation.[10] Connoisseurship characterizes expertise that is developed, expressed, and passed on through the constantly refining process of *practice*. Somatics practice develops expertise that can access and train *experiential acuity* including observation, discernment, synthesis, empathy, focus and clarity. The somatic body-based traditions require techniques that use attention, observation, and discrimination, applied to the material of experience for the purpose of self-cultivation. These techniques are developed through training that is tested and validated through the efficacy of practice. Michael Polanyi expresses connoisseurship as an example of personal knowledge that underlies much of what remains *unspecifiable* at the heart of science and technology[11]. Elliot Eisner has contributed insightful and persuasive arguments in support of the concept of connoisseurship as a methodology within educational research and the arts that focus on experience as a source of knowledge:

> Perception manifests itself in experience… The character of that experience is in large measure influenced by our ability to differentiate among the qualities we attend to… The ability to make fine-grained discriminations among complex and subtle qualities is an instance of what I have called *connoisseurship.* Connoisseurship is the art of appreciation.
>
> It can be displayed in any realm in which the character, import, or value of objects, situations, and performances is distributed and variable.[12]

[10] Eisner, E.W. (1998). *The Enlightened Eye: Qualitative Inquiry and the Enhancement of Educational Practice,* Upper Saddle River, New Jersey: Prentice Hall, p. 63.
[11] Polanyi, M. (1958), op. cit., p. 55.
[12] Eisner, E. (1998), op. cit., p. 63.

Through connoisseurship, the *role* of somatic facilitation can invite *somatic sensibilities* into the valuation and evaluation of technological interaction design within HCI. Modeling user experience within HCI is indeed distributed and variable, and the need to develop mechanisms to explore experience as material in the design process can be fulfilled in part through somatic facilitation.

The field of HCI is inherently interdisciplinary and its history is one of the inevitable disciplinary 'multiculturalisms' spawned by the expansive impact of technological growth. Just as ethnography was repurposed through the historical collaboration between Victor Turner and Richard Schechner, changing the face of performance studies, ethnography has also shared an interdisciplinary collaboration within human computer interaction. Within HCI, ethnography has altered values, methods and approaches to studying users in the context of their homes, environments and cultures. As human computer interaction has responded to the democratization of technology in work, play, home and mobile social networks, so it has continued to collaborate with domains from the social sciences and humanities, expanding the reach of its knowledge and methods. It is now commonplace for ethnographers to work within a technology design team, where outcomes are published and peer reviewed within a growing interdisciplinary HCI community.

> HCI has long found gainful employment for ethnographers and ethno-methodologists who are probably as surprised as anyone that their sociological training should turn out to be useful to [technology] design.[13]

Like ethnography, somatic facilitation enacted through connoisseurship can play a role in the technological design process that is a central theme and outcome of HCI research.

[13] Wright, P., Blythe, M., & McCarthy, J. (2006), op. cit., p. 13.

> In its customary mode connoisseurship is concerned with matters of quality, in the sense of value…. Judgments concerning quality depend upon… refined sensibilities [that] allow us to make fine-grained discriminations from what concepts may be formed.[14]

In somatic connoisseurship, matters of quality refer to the ability to recognize and discriminate between qualities of experience. Somatic sensibilities support fine-grained discrimination regarding the use of experience as material within the design of interaction. In this way somatic connoisseurship can facilitate the development of techniques of awareness, the simple act of paying attention. Depraz, Varela and Vermersch have used the term 'reduction' (borrowed from Husserlian phenomenology) to describe this technique. They suggest that apprenticeship requires facilitation, and that training is the key to developing access to the 'fine-grained discriminations' of connoisseurship as referred to by Elliott Eisner and his discussion of connoisseurship and judgments of value. Depraz, Varela and Vermersch insist on the importance of *apprenticing* in the practice of experience:

> We have to count [apprenticeship and] training among the more fine-grained aspects of the basic cycle and the work session [of training people to use their attention more skillfully within experience]. We stake our claim here: if reduction [a technique of paying attention to first-person experience] means anything, it means that, with proper training, it can become part and parcel of everyday life.[15]

The term 'work-session' as used by Depraz, Varela and Vermersch can be translated to somatic facilitation events within the case-studies such as "participant workshop" as used in whisper, exhale and *soft(n)*, "facilitated interaction" as used in whisper and exhale and "use of guides as facilitator" as used in whisper and exhale. Specific examples of these types of experiential training events are described in section 8.4. Examples of Somatic Facilitation through Connoisseurship.

[14] Eisner, E. (1998), op. cit., p. 69.
[15] Depraz, N., Varela, F.J., & Vermersch, P. (2003), op. cit., p. 99.

> Connoisseurship, like skill, can be communicated only by example, not by precept. To become an expert wine taster, to acquire a knowledge of innumerable different blends of tea or to be trained as a medical diagnostician, you must go through a long course of experience under the guidance of a master.[16]

Although somatic connoisseurship requires expert training, and a 'long course of experience' in order to refine experiential discernment and evaluation, these experiential skills can be communicated by example. Somatic facilitation within technology design aims to make experiential skills accessible for 'everyday' bodies including participants, researchers and design team members. The role of the somatic facilitator as connoisseur makes is possible to apply somatic body-based skills throughout many levels of the design process, from participant workshops, to collaborative team development, to participant guidance during an installation or in technology prototyping. Eisner describes connoisseurship in terms of "potential experience". This potential has to do with our ability to recognize specific qualities inherent within experience. This ability is an experiential skill that can be learned. Eisner uses the metaphor of the wine connoisseur to describe this potential experience:

> I say "potential", because whether we can in fact experience [a specific quality within experience] such as 'the wine's perfume', for example, depends on *both* the existence of the perfume, and our ability to notice it."[17]

Somatic connoisseurship facilitates access to potential experience. It accomplishes this through training *our ability to notice*. Somatic connoisseurship facilitates self-learning and the development of self-knowledge through co-experience. Within a technology design process, the experience of the facilitator's somatic sensibilities can also help to develop the somatic sensibilities of participants, researchers and design team members.

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[16] Polanyi, M. (1958), op. cit., p. 54.
[17] Eisner, E. (1998), op. cit., p. 64.

Polanyi was among the first to describe connoisseurship as a learned *ability*, as well as a *method* of knowledge acquisition. His concept of personal knowledge proposes that connoisseurship contains an unspecifiable element of knowledge.

> The large amount of time spent by students of chemistry, biology and medicine in their practical courses shows how greatly these sciences rely on the transmission of skills and connoisseurship from master to apprentice. It offers an impressive demonstration of the extent to which the art of knowing has remained unspecifiable at the very heart of science.[18]

Although Polanyi suggests that personal knowledge is in part *unspecifiable*, I argue that the value of articulating somatic body-based techniques within a technology design framework is their *ability* to specify some aspects of bodily awareness. In my view this specifiability does not counter Polanyi's view, but augments it. Kieran Egan describes somatic knowledge as being a foundational experience that can ground language. Egan refers to the qualitative experience of unity that can occur between somatic understanding and linguistic comprehension as an "ultralinguistic experience".

> The tension between the Somatic foundation of consciousness and the… flexible, linguistic superstructure allows… an understanding of ultralinguistic experience; this Somatic experience provides us with something below language that our language can strive to be true to.[19]
>
> Somatic understanding is the first kind [of understanding] in the sequence… The Somatic is a somewhat distinctive kind of understanding… coalescing and accommodating with each subsequent kind of understanding as they develop on Somatic foundation. Somatic understanding, then, is not something that exists only prior to language development but rather, like each of these kinds of understanding, it ideally remains with us throughout our lives, continuing to develop within.[20]

Egan echoes the position of many of the somatic practitioners described in Chapter Two, who view somatic facilitation as enabling one to speak from *within* experience, rather than *about* experience, extending how we consider *specifiability.*

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[18] Polanyi, M. (1958), op. cit., p. 55.
[19] Egan, K. (1997), op. cit., p. 170.
[20] Ibid, p. 163.

Somatic practice 'exploits' the *malleable* property of our own state, and can directly affect and increase our properties of agency and, echoing Foucault, to act upon our self in order to transform the self[21]. Somatic practice *specifies* the art of recognizing experiential qualities through *functional* techniques, which use attention as an *operation* in order to shift the *variable* of experience. Attention operates on experience in order to alter our state, and that state includes access to specific qualities and types of knowledge. This ability to recognize and value qualities within experience and to transform our own state includes the art of appreciation.

> Connoisseurship is the art of appreciation. We see it in the arts all the time, as will as in other areas of life where someone knows by virtue of experience and study what he or she is attending to.[22]

8.3 Self-Evidence in Support of Connoisseurship

Because somatic connoisseurship focuses on experience as material, and on using attention as an operator to transform that experience, this section summarizes the variety of ways that one can focus attention in experiential activities. This description serves as a contextual grounding for specific examples used within the case studies described in Section 8.4.Examples of Somatic Facilitation through Connoisseurship. Attention directs our observational focus. The redirection of attention can shift the quality of our experience, knowledge and body-state. Somatics offers techniques that can train an attentional skill-set. These techniques identify the *praxis* of somatic facilitation, illustrating how the direction of attention is a "concrete action"[23] that has the ability to transform personal understanding and knowledge.

> Praxis [defines] the plane of action as a self-sufficient conduct. In *praxis,* conduct finds its truth in itself and does not need a prepared blueprint. Praxis also entails changing the world and yourself by *concrete action*.[24] [italics mine].

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[21] Foucault, M. (1988c), op. cit., p. 18-19.
[22] Eisner, E.W. (2002). *The Arts and the Creation of Mind,* Connecticut: Yale University Press, p. 57.
[23] Depraz, N., Varela, F.J., & Vermersch, P. (2003), op. cit., p. 17.
[24] Ibid.

In the context of this thesis, one of the primary goals of somatic facilitation is to expand the practical application of embodied theory within technology design through the application of somatic awareness techniques. Figure 102 differentiates between first-, second- and third-person perspectives. It illustrates how observation serves as a form of directed attention. Although represented as distinct positions, there are multiple gradations between first-, second, and third- person perspectives including a multitude of collective and intersubjective relationships between these views[25]. The intentional act of attention enables us to consciously observe various activities both external and internal to ourselves. Amongst others, Depraz, Varela and Vermersch argue that intentionally redirecting our attention or observational focus, effects transformation of our state. This technique of redirection is a concrete action involved in the process of developing somatic sensibilities of *becoming aware.*[26]

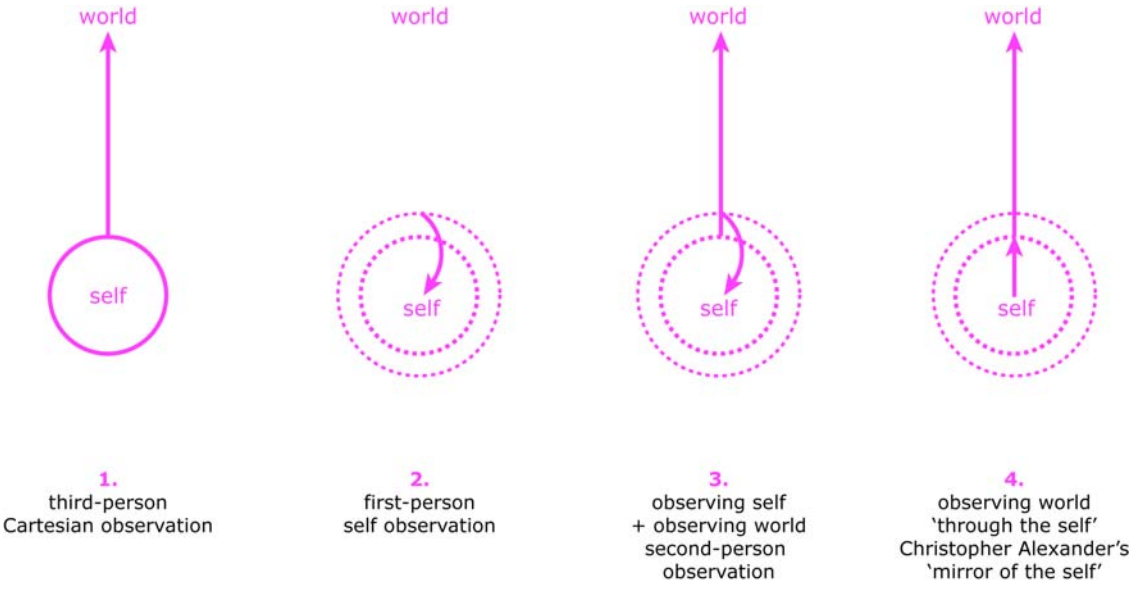

Figure 102. Modes of Observation provide us with different qualities and types of information

Attention can be focused through a certain sense. We can attend through the sense of touch or sight, or through a physical bodily process such as breath or movement.

[25] The concept of first-, second- and third- person observation as describing a continuum along a social network has been described in Chapter 2; see Depraz, N., Varela, F.J., & Vermersch, P. (2003), op. cit., p. 79.
[26] See also Alexander, C. (2002), Boal, A. (1992), Burrow, T. (1999), Deikman, A. (1983), Fraleigh, S.H. (2004), Gendlin, E.T. (1996), Johnson, D.H. (1995), Shusterman, R. (2008), Yasuo, Y. (1987).

We can attend directly or diffusely. We can attend to another, or we can attend to another *through* our self. These variations are a matter of practice and can be facilitated through the application of somatic sensibilities. The *values* of self, attention, experience and inter-connectedness as somatic sensibilities have been described in detail in Chapter 2. Their importance to articulating somatic connoisseurship is reintroduced here, as they play an important role in somatic facilitation described within the case studies.

Third person Cartesian perspective and 'everyday' awareness

For the purposes of the case studies, the use of third-person observation can be viewed in two ways, 1) in the formal sense of third-person Cartesian observation as reflected in the scientific method, and 2) in the informal notion of 'everyday awareness'. With regard to the experience of participants, users, design team members and collaborators interacting with a technological system, it is this second category of 'everyday awareness' that defines our understanding of third-person experience within somatic facilitation in the case studies.

One can expect that most workshop/installation participants enter into the space with a natural attitude and 'everyday awareness'. Depraz, Varela and Vermersch describe this mode of attention as a *realist prejudice*: the perception that "what appears to you is truly the state of the world"[27]. One of the goals of whisper, exhale and *soft(n)* was to enable a scripted procedure for moving participants from their 'everyday awareness' which tend towards an outward direction, to an awareness of their own 'attending to' their body-state, which tends towards an inward direction.

First person perspective and self-observation

Another one of goals of this research is to support an experiential 'container', supported through technology, in which participants can simply "pay attention to the self". Since

[27] Depraz, N., Varela, F.J., & Vermersch, P. (2003), op. cit., p. 25.

the practice of various forms of awareness training use a set of procedural techniques or 'steps' to facilitate the transition from everyday awareness to self-observation, this type of structured facilitation is also used within the case studies.

> We seek the explicit characteristics of a very specific human *ability*: becoming aware as *coming to know in the first person*[28]

First-person processes were used in participatory workshops that occurred throughout the design of whisper, exhale and *soft(n)*. This resulted in the design of 'attentional stages' incorporated into the interaction. The goal was to support specific experiential characteristics within the installation. Additionally, many aspects of the technology design process required somatic facilitator-led design exploration and discovery. This included the facilitator exploring their own experience in a number of settings including: testing sensor experience, and developing garment design and interaction movement with the goal of seeking interaction that could "afford" self-connection.

Second-person perspective and somatic facilitation

Somatic facilitation exists within the continuum of second-person perspectives. This includes participant observation in workshops, facilitating co-experience in collaborative teams with researchers, building a shared knowledge of techniques that enable 'connecting' to the experience of another, and building empathic relationships to all aspects and materials of the design process including: accessing body state, use of space, exploratory process, and technology development. Depraz, Varela and Vermersch clarify that observational positions sit along a continuum, and that there are gradations between first, second and third person positions.

> The three positions [first-, second- and third] … each have multiple gradations defined as a function of the *emphasis* one puts on accomplishing a particular mode of validation…
>
> [in the second person perspective] we move from the position of anthropologist to that of coach or midwife, to the subject … opening up to intersubjectivity [during the interview].[29]

[28] Ibid, p. 3.

Somatic facilitation is instantiated through multiple approaches available within second-person perspectives. Somatic facilitation uses skills of empathic mediation, resonance with the experience of others and personal familiarity with the various possible subtleties of participant experience, based upon the intimate preparation generated cumulatively from the experience of living deeply within the design process. In this sense, somatic facilitation exists during all phases of the exploratory design process, building up shared experience between collaborators and design team members as well as unique personal experience that can be used as material 1) in the iterative design and genesis of the technology and 2) in the co-experience with participants within the interaction during exhibition.

> A second-person position is an *exchange between situated individuals* focusing on a specific experiential content developed from a first-person position. The second-person position is thus typically instantiated in a tutor or guide, someone who has more training in or exposure to a certain domain, and who tries to help the expression and validation of someone else.[30]

As a result of somatic facilitation within the case studies, the technological design process constructed affordances for second-person interaction in whisper, exhale and *soft(n)*. This interaction concept (named *self-to-other*) was initially developed within whisper, and was then extended to exhale and *soft(n)* because of its success in representing second-person empathic interaction in a technology model. The interaction mode of *self-to-other* is a second-person position in which the exchange of breath, heart rate, or tactile effort quality could be observed and shared 'as sensory experience' through the interaction models within these installations. Additionally, facilitator second-person participant-observation was an instrumental component of monitoring the workshop activities in whisper, exhale and *soft(n)*, and in gathering data from participatory activities that revolved around qualities of experience.

[29] Ibid, p. 84.
[30] Ibid, p. 81.

Observing through the self into the world

Observing through the self into the world is a form of second person observation based on the 'mirror of the self' technique developed by Christopher Alexander. This technique was generated through decades of design practice in Alexander's architectural practice. Alexander defined the 'mirror of the self' as a method for observing relative wholeness within a situation, action or object.

> [This is] a very general type of observation that relies on the observer's study of his or her own state of wholeness as it exists in front of different things or systems being observed *and then uses the observer's experience as a measurement on the system being observed to determine that system's objective degree of life.*[31]

This technique enables comparisons of relative wholeness measured through the experience of the self. It answers the question: "*Which of the two [situations, actions or objects] makes me experience a deeper feeling of unity or harmony within myself?*[32]" Within the case studies, the 'mirror of the self' was used as a somatic facilitation technique in a number of facilitator-led explorations that required design choices to be made based on various conditions. Examples include: exhibition space design in Rotterdam for the whisper exhibition, garment design in whisper and exhale, and interactive object design in *soft(n)*. The benefit of this technique is that it enables the discernment within somatic connoisseurship to operate within the *value* of inter-connectedness (or wholeness) as a design goal,[33] and to experientially compare and evaluate design choices base on this goal. Alexander intended the 'mirror of the self' to be used as an evaluation tool. This evaluation tool can assist us when we are trying to observe conditions or knowledge that create an experience of greater wholeness in our relationship with the world. [34]

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[31] Alexander, C. (2002), op. cit., p. 364.

[32] Alexander poses a series of possible approaches to 'wording' the question of relative wholeness, Ibid, p. 355.

[33] The value of inter-connectedness was described in Chapter 2 as a core value of somatic epistemology.

[34] Alexander also uses the experiential qualities of harmony, unity, aware, 'a greater feeling of life', 'expansion of my humanity', 'my best self', 'a picture of my eternal self'. Note that Alexander's descriptions are intended to evoke an experiential quality, not to *describe* the experience. This is based on the concept that our experience has verifiable value that exists within the subject in its relationship to the world.

Alexander also acknowledged that not all discernment of the world is equally perceivable. Although he intended the 'mirror of the self' technique as having widespread use, he also acknowledged that there are varying degrees of abilities used in this type of second-person observation, and in some situations a level of expert attentional knowledge is required. I have been using the term somatic connoisseurship to refer to this type of self-knowledge, one that requires time and practice to develop. Alexander acknowledges that:

> …in these very difficult cases, accurate judgment requires a level of self-knowledge on the part of the observer. This may take a long time to develop, and often does not exist until a person has spent years looking at things, sharpening his or her power of discrimination.[35]

In the case studies, somatic connoisseurship was used in order to assess and select optimal design choices that could facilitate greater self-connection within the installation experience, and to design for this goal. This often required a second-person empathic stance that could imagine the participant's experience through one's own, and could assess interaction 'tasks' as enabling self-connection for an 'everyday' body in an 'everyday' situation. These kinds of choices clearly require a trained attentional skill set to support and evaluate effective design choices.

> In order to *measure* [the] degree of life [in any living situation] it is difficult to use what, in present-day science, are conventionally regarded as "objective" methods. Instead, to get practical results, we must use *ourselves* as measuring instruments, in a new form measuring process which relies (necessarily) on the human observer and that observer's observation of his or her own inner state.[36]

In the case studies the 'mirror of the self' test was used in facilitator exploratory movement workshops where optimal modes of interaction created and maintained connection to one's self even while connecting to another. The interaction paradigm required that an 'act of connection' require a physical action by the installation

[35] Alexander, C. (2002), op. cit., p. 366.
[36] Ibid, p. 354.

participant. For example, in the garment design of whisper, the choice between using connection symbols that could be seen, or fabric texture that could be felt, was decided through the 'mirror of the self' test enacted in conjunction with members of the design team.

Procedural Description: Suspension, Redirection and Letting-Go

The previous descriptions have accounted for varying ways in which we can approach observation and the praxis of attention. Another aspect of the application of attention is that its redirection can enable varying degrees of the experience of wholeness or inter-connection: the techniques of *becoming aware.*

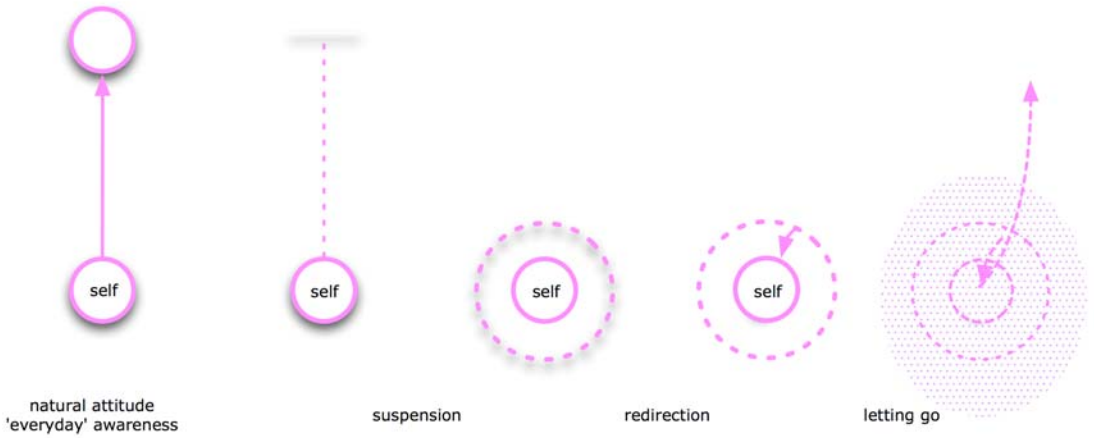

Figure 103. Moving between modes of Observation is a Somatic Attentional Technique that can be supported through Somatic Facilitation and takes the Form of a Procedural Description

Because the experiential goals of whisper, exhale and *soft(n)* shared the goal of creating 'affordances' for the experience of inter-connectedness with networked participants 'as a whole', this process has relevance for the technological design of these installations. Figure 103 illustrates the transitions between observational focus, (attentional redirection), that result in transformation of awareness and the perception of inter-connectedness. This diagram illustrates an attentional technique described by Varela, Vermersch and Depraz. The reference to suspension, redirection, and letting go [illustrated earlier in Figure 9, Chapter 2, page 60] is the movement from one state to another through the first-person process of directing attention to one's experience.

This process of self-connection is shared among many first-person approaches within somatics, movement arts such as contemporary dance, psychology, mindfulness and other self-transformational practices[37]. Depraz, Varela and Vermersch summarize this process using three procedural steps:

- *Suspending* your "realist" prejudice that what appears to you is truly the state of the world; this is the only way that you can change the way you pay attention to your own lived experience; in other words, you must break with the "natural attitude"
- *Redirecting* your attention from the "exterior" to the "interior"
- *Letting-go or accepting* your experience.[38]

These procedural steps were used as a guide for leading experiential stages within the participant workshops of whisper, exhale and *soft(n)*, in various facilitator-led explorations and within the installation design itself. For example, the whisper and exhale installation use guides (somatic facilitators) to lead participants into the space, helping them put on the garments, facilitating their first steps of interaction with their own body data, and then leading them to being interacting with another participant within the space (self-to-other interaction). This facilitation included stepping back once participants could interact in the space on their own, and observing the interaction space from an empathic mediation perspective.

Each of the stages represented in Figure 103 also represent different experiential *states* within the body. Each state uniquely results from the body's inner attitude. These stages can be correlated to Laban's effort drives, which correspond to inner attitude. The first stage, the natural attitude of everyday awareness, corresponds to the *action* drive (in which flow is absent, and in which movement is crystallized in action). The second stage, *suspension*, which reflects suspension of judgment, which in Laban's language relates to suspension of the attentional space effort; this would correspond with Laban's *passion* drive (in which space is absent, which is akin to

[37] This has been discussed in detail in Chapter 2.
[38] Depraz, N., Varela, F.J., & Vermersch, P. (2003), op. cit., p. 25.

attention being suspended momentarily). The third stage, *redirection*, corresponds to directing our attention inward, releasing our exertion or weight in the world; this corresponds to Laban's *vision* drive, in which weight is absent. Finally, the fourth stage, *letting-go*, corresponds to Laban's *spell* drive, the timeless drive, in which the experience of passing time is absent. Notably the experience of timelessness is often associated with unity, inter-connectedness and a sense of 'being one with the environment'. Victor Turner's acknowledgement that somatically based techniques used in ritual are *designed* to shift the neurobiological state of the entire soma toward a shared group experience of gestalt, timelessness and transcendence,[39] is an example that was cited in Chapter 2. The psychologist, Shellie Levine, has described awareness as a 'topology' in which multiple levels of awareness construct varying experiential 'logics', so that knowledge is state-dependent.

> I offer a theory of the topology of awareness having significant implications for our understanding of the nature of mind… Topology—the study of architectural wholes as contrasted with a linear summation of parts—reveals that levels of awareness are organized according to multiple levels of logical types. Lower levels are closer to consciousness and construct reality according to the organizing principle of Aristotelian logic, binary oppositions, and the experience of entities as unitary, bounded and independent. Higher levels of awareness… articulate the fact that entities are gestalts in intimate relations to one another. The organizing logic or higher levels is dialectical logic, a logic that disposes of binary oppositions in favor of harmonious synthesis and relations between gestalts.[40]

Levine, like Turner, Laban and Alexander, acknowledges that embodied knowledge is state dependant. Because attention operates on experience in order to alter our state, and because state includes access to specific qualities and types of knowledge, our goals of developing attentional skill through technology also has multiple levels of social and ethical value. This approach can expand resources for technological design that transforms the self and the world.

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[39] Turner, V.W. (1986), op. cit., p. 43.

[40] Levine, S. (2000). Topology of awareness: therapeutic implications of logical modalities of multiple levels of awareness, *Journal of Poetry Therapy, 14*(2), The Netherlands: Springer, p. 79-95.

8.4 Examples of Somatic Facilitation Through Connoisseurship

This section describes examples of somatic facilitation through connoisseurship, focusing on the case studies as a whole. These examples support the goal of engendering a role for cultivating self-awareness within interaction, thereby enabling our digital technologies to support the development of an *attentional skill-set* for experience. They also illustrate the application of the *values* of self, attention, experience and inter-connectedness, described in Chapter 2 as central to defining somatic sensibilities. The proposition is that somatic facilitation can be a resource within a technological design process when there is a need to design for a relationship to the self within the user experience. This could have application in systems that rely on contextual awareness, reminder systems, approaches to computer gaming and in research in technological design for health or well-being as well as 'design for the self'.

Some specific questions that are illustrated through the following examples include: What are examples of somatic goals that can be used when designing for experience? How can the relationships of *self-to-self*, *self-to-other* and *self-to-group* be applied within a somatic framework of interaction?

8.4.1 Facilitating Experience Through Procedural Description

Depraz, Varela and Vermersch used the phrase *procedural description* to describe a delimited scripted procedural process that occurs within a *session* in which the techniques of 'becoming' aware' are enacted and practiced[41]. A session lasts for a limited period of time that is situated outside of 'everyday' activity. It frames a procedural process in which the stages of suspension, redirection and letting-go are supported by a facilitator, and it includes both the expression and the validation of the experiential 'findings' or insights produced by this basic cycle. Depraz, Varela and Vermersch describe this as follows:

[41] Depraz, N., Varela, F.J., & Vermersch, P. (2003), op. cit., p. 65-96.

> We focus on the time-scale inherent in *a session that lasts for a few hours…* [this time frame] refers to social practices, which set the boundaries to the way in which most of use are able to develop the practice of becoming aware… The reason why we center our analysis on the temporality is simply because it corresponds best to the way in which most people are likely to encounter these practices. By referring to the session as the context of the act of becoming aware, we maximize its situated and embodied dimensions.[42]

Depraz, Varela and Vermersch site exemplary variations of such *sessions* including guided introspection, *shamatha-vipashyana* meditation practice, stereoscopic vision, a psychoanalytic session, the heartprayer, a writing session and a beginning philosophy course[43]. Other examples from within the fields of somatics and modern dance performance could include an Alexander session[44], a Feldenkrais Awareness through Movement session[45], contact improvisation, a Viewpoints session[46], Ashtanga yoga practice[47], a Butoh class[48], an improvisational movement session, one of the many actor's exercises described within Augusto Boal's 'The Arsenal of the Theatre of the Oppressed'[49], or a Deep Listening session as developed by Pauline Oliveros.[50] The common features of these kinds of processes are 1) that they are guided by a facilitator who has refined the technique through practice of *connoisseurship*, 2) that they move through a guided experiential process of becoming aware in which everyday experience moves through suspension, redirection and letting-go, 3) that they occur within a delimited timeframe that is distinguished from everyday experience, and that 4) they involve both expression and validation, where expression is framed within the first-person perspective of the participant and validation is framed within a second-

[42] Ibid, p. 21.
[43] Ibid, p. 22.
[44] Brennan, R. (1996). *The Alexander Technique Manual: A Step by Step Guide to Improve Breathing, Posture and Well-Being*. Boston: Journey Editions.
[45] Feldenkrais, M. (1972), op. cit.
[46] Bogart, A. & Landau, T. (2005). *The Viewpoints Book: A Practical Guide to Viewpoints and Composition.* New York: Theatre Communications Group.
[47] Swenson. D. (1999). *Ashtanga Yoga: The Practice Manual,* Austin, Texas: Ashtanga Yoga Productions.
[48] Fraleigh, S.H. (2004), op. cit., p. 153-193.
[49] Boal, A. (1992), op. cit., p. 60-222.
[50] Oliveros, P., see <http://www.deeplistening.org>

person framework that takes place between the participant and the facilitator guiding the participant back to everyday experience in order to complete or close the session, thereby bringing the *value of the experience* of the session back into everyday life.

The whisper and exhale workshops described in Chapter 5 and 6 are examples of *work-sessions* that utilize scripted procedural processes to guide participants through an experiential process. The exploratory design process of *soft(n)* also employed similar participant workshop processes (see Figure 104).[51]

Figure 104. *soft(n)* Workshop Participant – Another Example of Somatic Facilitator Led Exploration

Somatic facilitation uses skills of empathic mediation, resonance with the experience of others and personal familiarity with the subtleties of participant experience. The function of *guides* in the workshop process is to facilitate shared experience, recognizing qualities of attention, and demonstrate how to recognize the self within interaction. The goal of these sessions is to support the development of somatic sensibilities in an everyday context in order to support both a contemplative and a playful approach to self-awareness.

[51] Examples of guided scripts used in participant workshops for whisper, (p. II-51, II-62-64, II-72, II-92) exhale, (p. II-120-122, II-160-162), and soft(n) (p. II-269-271) are located in Appendix C, D and E respectively. These Appendices also include workshop feedback cards, transcription of video interviews, and written response cards, as well as data summary. See also <http://whisper.iat.sfu.ca/process.html>

Figure 105 illustrates somatic facilitation during workshop processes for whisper, exhale and *soft(n)*[52]. In each of the case studies, guided scripts were used during participatory user workshops in order to facilitate experiential exploration of first-person participant experience. Participants practiced their 'ability to notice' their own awareness of their body/sensory data.

Figure 105. Workshop Guides support Scripted Procedural Description in whisper, exhale + *soft(n)*

The images in figure 105 illustrate workshop explorations of body data facilitated through a scripted experience (from left to right): heart data (whisper), listening inside (whisper), breath (exhale), body-state (exhale), and touch (*soft(n)*). Guided somatic processes include *attending to* the participant process, *speaking* a prepared script to guide participant experience, and *recording* participant experience as evidenced by their movement and behaviour. The recording processes involve participant observation, in which facilitation moved *between* digitally recording activities, and *sensing* or *interpreting* the participants experience to assess timing, flow, rhythm and duration of activities. These assessments were made through empathic mediation, with the goal of increasing the participants' ability to stay 'connected' to their own experience, and to support self-observation.

[52] Figure 105 depicts whisper and exhale somatic facilitators and artistic collaborators Thecla Schiphorst and Susan Kozel (in the first 4 images), and Thecla Schiphorst as a soft(n) workshop guide and facilitator in the final image. Kristina Anderson also contributed to supported workshop processes during the whisper workshops.

Guided procedural processes are also incorporated in the final public exhibitions of whisper and exhale. This design choice was incorporated as a result of the instrumental success of guided somatic facilitation during the earlier participant workshops. Both whisper and exhale incorporate *guides* as somatic facilitators during the public interactive art exhibition. Guides support participant experience by facilitating transition through the stages of the installation experience. The guide's somatic facilitation process is enacted in five stages. 1) During the first stage, the guide directs the participant's attention toward their body-data through the activity of 'putting on' the garment. This ritualized act invites the participant into the installation space, setting an experiential *tone* for attending to their state. This includes an explanation of garment functionality using physical illustration of connecting to one's own data through the garment (self-to-self interaction).

Figure 106. Guides support the 5 stages of participant interaction within whisper
From left to right: Stage 1 Dressing Participant, Stage 2 self-to-self exploration + Stage 4 self-2-other

2) During the second stage, the guide *steps back* to enable the participant to become familiar with self-to-self interaction. The guide maintains an attentive stance of empathic mediation that includes co-experience with participants, paying attention to the participants experience and engagement within the interaction of self-to-self. The guide's ability to employ these techniques is based upon the intimate preparation generated cumulatively from both somatic training and the experience of participating within the design process. The participant *practices* self-to-self interaction during this stage, learning to recognize and interact with their body-data within the system. The

end of the second stage is signaled by the participant's ability to create expressive self-led interaction within the system. The guide recognizes this signal by discriminating the shift in quality of the participant's experience. 3) During the third stage the guide re-enters the participant's space by demonstrating how to 'connect with' another participant in the space. This demonstration is not utilitarian in the task-oriented sense, as it is not required in order to 'operate' the garment. Rather it supports fine-grained subtleties of the participant's experience, and is executed by physically guiding the participant into self-to-other interaction. 4) During the fourth stage, the guide steps back once again, to allow participants to explore collective experience and self-to-other interaction through shared data articulated within one another, through the garments. Participants typically remain within the installation for an average of 20 to 30 minutes. 5) The fifth stage is signaled when a participant elects to end their interaction by moving out of the space. The guide assists in the removal of the garment, while inviting feedback regarding participant's experience of the installation. This provides a space for experiential validation and evaluation between the participant and the guide. It also provides valuable feedback of the interaction model to facilitate self-observation while *supporting a participant's ability to notice and discern their sensory body data*.

8.4.2. Somatic Facilitated Phenomenological Inquiry through Movement

The previous section explored the application of guided somatic facilitation using procedural scripts with users, workshop participants and members of the public that interact within the installation. In the case studies as a whole, many aspects of the technology design process required somatic facilitator-led design exploration and discovery. Somatic facilitation can also be applied to a technology design process through an inward focus that can be directed through the somatic facilitators themselves. In whisper, exhale and *soft(n)*, somatic facilitation was also operationalized within the evaluation process of the design team. This included the

somatic facilitator exploring their own experience in a number of settings including developing garment design and interaction movement with the goal of seeking interaction that could "afford" self-connection. This section explores facilitator led movement exploration incorporated into the garment design process of whisper. A subset of these techniques were also used within exhale and *soft(n)*.

Data gathered and analyzed from whisper participant workshops resulted in an interaction model,[53] which defined a conceptual starting point that included a set of experiential design goals for interaction. Design refinement was required in order to evaluate design criteria that could produce specific garment features, interaction affordances, functional specifications for wiring placement, and materials selection for interaction. These design criteria were explored and evaluated through *somatic facilitated phenomenological inquiry through movement*. This approach was selected for two primary reasons, 1) one of the goals of the whisper installation was to utilize *participant movement* in order to support self-connection, and 2) the whisper collaborative design team was led by two dance and somatic trained facilitators[54] who possessed the skills necessary to articulate fine-tuned discernment and judgment in evaluating this goal.

Figure 107. Somatic Connoisseurship through Movement Interaction Studies for whisper garment

Just as we can direct our attention to our breath, we can direct our attention to our movement in order to create a space for self-connection.

[53] See Appendix C, whisper interaction model, p. II-31, II-43-49.

[54] Somatic facilitators for the whisper movement sessions are Thecla Schiphorst and Susan Kozel, who collaborated in concept development and articulation, particularly in relation to somatic sensibilities.

In *The Primacy of Movement*[55], Maxine Sheets-Johnstone notes how movement can function as an attentional operator, shifting our state from our natural attitude, suspending judgment and redirecting our attention through the process of phenomenological *epoché,* as described in Section 8.3, by Depraz, Varela and Vermersch. Sheets-Johnstone writes:

> But the different way of looking [at movement] can be extended still further by breaking ties to the natural attitude. When we begin our investigations by suspending judgment, but instituting the phenomenological *epoché*, the familiar becomes strange. In effect, we examine the experience of movement anew, as if experiencing it or meeting it for the first time. In this way, we discover what is there in the phenomenon of movement in kinetic variants. Through this phenomenological methodology, we come to ground the fresh and innovative finding… in the deeper truths of animate life.[56]

In the somatic movement facilitation within whisper, movement was explored in order to assess qualities of self-connection that could be "afforded" through the garment design. Design goals included questions such as: what kinds of movement can be enacted through the garment, and of those movements, what movement is best supported in the garment in order to increase self-connection? Somatic facilitators used self-directed movement in a structured improvisational setting to explore how movement could support self-knowledge articulated through the garment design. Sondra Fraleigh has recognized this goal of movement within dance studies as articulating concerns for 'the self':

> As self-directed movement, dance is also a source of self-knowledge. Thus dance studies may be designed around concerns for human development. In their study of perception and movement affectivity, cognitive psychologists articulate concerns for "the self" that could enrich research in dance somatics… Self-knowledge has a basis in sense perception including proprioception, the movement sense. All our movement is constantly being somaesthetically processed in the interweave of our senses, perceptions and emotions.[57]

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[55] Sheets-Johnstone, M. (1998), op. cit.

[56] Ibid, p. 265.

[57] Fraleigh, S.H. (1999). Family Resemblance, in Fraleigh, S. & Hanstein, P. (eds.) (1999). *Researching Dance: Evolving Modes of Inquiry,* Pittsburgh: University of Pittsburgh Press, p. 11-12.

The movement explorations utilized within the whisper garment design illustrate the intersection of somatics practice with contemporary dance processes, where movement exploration is intrinsic to interaction. Fraleigh considers this as a focus of the body-for-self that shifts its attention in an inward direction and can be considered a kind of *intrinsic dance:*

> *Intrinsic dance* is performed as body-for-self, not as body-for-other as in theatrical contexts, but looking inward to the experience. Logically speaking this would not be a type of dance, but a shift of attention.[58]

It is precisely this shift of attention that was a desired 'affordance' of participant's movement while wearing the whisper garment, where the interaction gesture could support a participant's ability to 'look inward to the experience' during interaction. This *phenomenological inquiry through movement* was based on exploring the interaction modes within the interaction model: self-to-self, self-to-other, and self-to-group. We sought specific design solutions that would enable the development of a wearable garment. The goal was to further refine specific interaction 'gestures' and garment interaction affordances. This design approach modeled choreographic movement processes, where a choreographer prepares movement material in a studio and then brings that material to a group of dancers in order to further explore and improvise.

Figure 108. Low Fidelity Prototype: Drawing the Wiring & Connection Results from First Workshop

[58] Ibid, p. 15.

The *somatic phenomenological inquiry through movement* operated in the following manner. Based on the interaction model designed as an outcome of the whisper workshops, a set of initial design decisions were made and corresponding design constraints were identified. These included the selection of a shirt-like or jacket-like garment that could house breath and heart-rate sensors, a microcontroller, batteries and supplementary wiring that could connect sensors and actuators to the microcontroller within the garment. The decision was also made to utilize a wireless body-area-network between each participant-garment and the central server, which would visualize and sonify participants' body data. This would enable whisper installation participants to move about freely in the exhibition space. Based on collective design team processes, a set of initial design suggestions were made regarding the garment configuration. These included an LED array situated on the left sleeve that would display the identity of the participant, a breath band sensor inside the shirt-jacket, a heart-rate sensor on the left hand, and a 'connecting snap' on the right hand. The concept of the connecting snap was developed from the Velcro 'attachments' explored within the workshops. The connecting snap would enable participants to select their own body data, and to share their body data with other participants within the exhibition. It would also function as a unique identifier for the participant, which would be transmitted to the central server.

Figure 109. Low Fidelity Prototype whisper Garment with Hand Drawn Wiring & Connection Position These Design Choices Resulted from "Mirror of the Self" Test Used in First Movement Workshop

The design goals for the movement workshop were to *evaluate* optimal solutions for a series of design decisions that would support the somatic values of self, experience, attention and inter-connectedness. The resulting design *decisions* were evaluative, and based on the outcomes of a set of design questions. These included: are the initial *suggested* design choices regarding placement of LED arrays, sensors, and connectors, in *optimal* locations for use (in both the physical gestural sense and attentional sense)? How can their positions support self-connection during interaction? Where are the optimal locations of *self-to-self* connection-snaps that *access one's own* breath and heart-rate? Where are the optimal locations of *self-to-other* connection-snaps for *sharing* breath and heart-rate with others? How can we optimize the location of connection-snaps based on the design constraint that requires self-to-self and self-to-other connection-snaps to be co-located on the garment[59]? Do the connection symbols that identify connection type (breath or heart-rate) "afford" recognition? Are they easy to identify and to locate on the garment? How can the connection symbols support the shift of attention from self-to-self to self-to-other, while maintaining self-connection during this interaction?

Although the underlying concept of whisper was 'the simple act of paying attention', the design decisions that would support this goal were variable, specific and complex. Somatic sensibilities influenced the high level goals of self, experience, attention and inter-connectedness, yet these high-level goals required the refinement of a specific technical, aesthetic, and experiential design that could be built and tested while it supported these somatic values. In order to effectively operationalize these values, the inclusion of *self-evidence* and a *non-alienated view of technology* is necessary.

[59] Connection-snaps were conceived of as identifiers. They were able to recognize the identity of the participant that was *connecting into* the snap. This enabled the system to parse whether the snap belonged to 'self' or 'other'. They could also recognize the specific identity of the 'other' thereby enabling connections between multiple participants. The whisper technical design solution utilized 'sewing snaps' which were conductive and could therefore close an electrical circuit when in contact through the act of 'snapping together'. Although both functional and aesthetic, this solution did pose some difficulties for some installation participants because the snaps were sometimes 'finicky' and required precise positioning. The concept of the identifier was evolved in the exhale design, producing a better design solution through the use of RFID tags which simply required proximity without precise contact.

I revisit the proposition stated earlier in this chapter. The inclusion of *self-evidence* and a *non-alienated view of technology* can occur in technology design when the *self,* embodied within the multiple roles of researcher, designer, artist, and participant or user, is included in the methodological structure of the design for technology, both as design goal and as design process.

The design approach within whisper was to 'live within' the system as deeply as possible, evolving appropriate somatic facilitation throughout the exploratory design process. The resulting approaches described here, were developed within the whisper design process and then cumulatively evolved during exhale and *soft(n)*. Cumulative design processes enable greater levels of validation regarding their efficacy as a resource for technological design within an HCI context.

In order to evaluate the design questions outlined on the previous page, two movement workshops were held. Each workshop was facilitated through *somatic phenomenological inquiry through movement*. The goal of the first workshop was to evaluate the initial design suggestions regarding placement of sensors, actuators and connectors on the garment. The goal of the second movement workshop was to evaluate the experience of the connection-snaps 1) connecting to one's own breath and heart-rate data through self-to-self interaction, and 2) connecting to another participant's breath or heart-rate and sharing that data in self-to-other interaction. Both of these workshops used a form of Alexander's "mirror of the self" test in which one possible design outcome is compared to another to evaluate which of the two "enables a greater connection to the self".

> The method which I propose is therefore different from currently accepted forms of observation… you are asked to record your own inner feeling, your own inner wholeness—and this is used then as the measure of the degree of life in some system of the outer world you are observing.[60]

[60] Alexander, C. (2002), op. cit., p. 367.

This approach has a historical resonance with many movement practices including dance somatics and intrinsic dance as described by Sondra Fraleigh[61], Augusto Boal's theatre exercises[62] and those found in the martial arts:

> A comparable test [of observing greater wholeness or unity between self and world] in which exponents of Aikido are asked to compare the inner state they find themselves when comparing two actions; these Aikido-trained individuals are quite used to discerning, and then using, their inner awareness of relative greater harmony in themselves as a measure of the goodness of the action contemplated.[63]

The movement workshops consisted of two (approximately) 45-minute improvisational movement sessions that were facilitator-led. Design goals were articulated and reviewed prior to each movement session. Discoveries and insights were noted and recorded during and following the movement sessions. The movement sessions were witnessed and documented by members of the garment design team[64]. The first movement session resulted in design choices that enabled garment design refinement regarding placement for LED array, wiring, sensors and the microcontroller (see Figure 108). The second movement workshop explored symbol placement for connection-snaps in self-to-self and self-to-other interaction. An additional design exploration based on Applied Kinesiology was incorporated to augment and refine movement workshop findings. These design explorations are described in the next two sections.

8.4.3. Connection between Participants: Symbol versus Feel

The second movement workshop explored design criteria related to the connection-snaps on the whisper garment. The goal of the workshop was to develop an optimal solution to enable both *self-to-self* and *self-to-other* selection within the interaction design of the garment.

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[61] Fraleigh, S.H. (1999), op. cit., p. 11-12.
[62] Boal, A. (1992), op. cit., p. 60-222.
[63] Alexander, C. (2002), op. cit., p. 354.
[64] The garment design team consisted of Thecla Schiphorst, Susan Kozel, Kristina Anderson and Maryan Meek-Schiphorst. The two latter team members witnessed and recorded the movement sessions.

Movement improvisation began by focusing on exploring *locations* on the garment that were *accessible* to the self, that made *sense* to the body, and that supported *movements or gestures* that expressed relationships to the self. The male-end of connection-snap was worn on the right hand on the second and third fingers, like a small finger glove, so that the female-end of the snaps would be positioned on the garment. This allowed the hand to 'reach' for the self in self-to-self interaction, or to reach for another in self-to-other interaction. During movement exploration a number of gestures were found that supported self-to-self movement. One was the right hand reaching across the front of the body to hug the ribs on the left side of the body. Another was the right hand reaching up and across the body to the left shoulder and then the collar of the neck. It became evident that affordances for *everyday* range of motion would constrain potential solutions, and that gestural comfort and ease, were additional design factors. Everyday range of motion dictated that the garment connection-snap positions would lie on the front of the garment since most people are not flexible enough to reach around to their backs. A movement discovery process led to the identification of positions that included the left waist, left ribs, left shoulder, and left collar. Note that all of the self-to-self gestures included *self-wrapping*, the metaphoric gesture of holding, or comforting the self.

Figure 110. Initial Connection-Snap Locations

The next stage in the movement improvisation focused on exploring *locations* on the garment that were *accessible* to the self but that could also be located by *another.* Because the self-to-self movements had identified a number of possible locations, these same locations were explored to assess their expressiveness and meaningfulness in self-to-other interaction. One of the movement discoveries was that the frontal location of the connection-snaps required two people to face one another, in a similar relationship to partner-dancing or intimate conversation. This face-to-face social convention also positioned the male-end on right hand of the connection-snaps in direct line with the partners female-end on the left sided garment connection-snaps. When both partners reached out to connect with one another, the gesture was one of dancing together. In this way the movement discovery was made that connection-snap locations that afford self-connection, were also able to afford self-to-other sharing.

Figure 111. Movement Discovery Leads to Self-to-Other Metaphor of Partner Dancing

The final stage of the second movement session explored the *representational* choice of the connection symbols, and the effect of that representation on self-connection within experience. This segment of the movement session answered the design questions: Are the connection symbols easy to identify and to locate on the garment? How can the choice of *connection symbol representation* support the shift of attention from self to other, while maintaining *inner* self-connection during this interaction?

During the first movement workshop a set of connection symbols were hand drawn on the low fidelity garment prototype to represent breath and heart-rate. The location of the connection-snaps enabled installation participants to *choose* which type of data (breath or heart-rate) they selected to 'attend to'. This created a need to distinguish between differing types of body-data alongside the connection-snaps. The original symbols were borrowed from the whisper interaction model, and are illustrated in Figure 112. The goal of this final movement exploration was to explore interaction with the symbols, putting oneself in the position of an installation participant entering the system.

Figure 112. Visual Symbols Representing Breath and Heart Data Reduce Self-Connection

The movement discovery was that searching for the visual symbol on the garment increased the cognitive load through the act of visual scanning. This discovery was surprising at the time, and was enabled as a result of *somatic phenomenological inquiry through movement.* The observation made during the movement session was that while the movement gestures of reaching out and connecting through the snaps supported self-connection and attention to one's body state, the added cognitive load of visually searching for the type of sensory connection negated that focus. It was also assessed that this would be particularly challenging for first-time participants and 'everyday' bodies within the system. This movement discovery resulted in further

explorations with textural textile symbols that required *tactile recognition*. Consequently, a mirror-of-the-self test was enacted which compared 'visual symbol reading' with 'tactile symbol sensing'. The tactile approach created far greater affordances for self-connection, maintaining attention to the self *while* connecting with another. The workshop results included documentation of design choices and next steps. Figure 113 illustrates notes taken following the second movement exploration which record that "symbols flatten experience", and recommend the use of fabric textural materials such as leather, flannel and wool that can be differentiated through touch.

Figure 113. Example Notes Taken From Movement Sessions - Symbols Flatten Experience

As a result of the design choice to use tactile symbols for the connection-snaps, a series of tactile materials were explored and tested for tactile aesthetic quality, ease of recognition and discernment.

Figure 114. Comparison of Recognition between Symbol + Feeling of Leather, Cotton and Wool

Figure 115. Design Process Selecting Tactile Nature of Fabric for Connection

Figure 114 and 115 illustrate tactile symbols and notes corresponding to design process that supported this stage of garment design.

8.4.4. Using Applied Kinesiology as a Facilitated Somatic Design Process

The movement workshops evaluated gestural interaction and raised queries regarding the effect of electrical energy in close proximity to the body. The human body is affected by electricity and magnetic fields because of their ability to induce currents. There is a continuing debate concerning the effects of power frequency (50/60 Hz) fields on the human body, particularly with the increasingly widespread use of local magnetic stimulation in diagnostic and therapeutic modalities, and the increased use of cellular phone electromagnetic radiation[65].

[65] Reilly, J.P. (1998). *Applied Bioelectricity: From Electrical Stimulation to Electropathology,* New York: Springer-Verlag.

Figure 116. Applied Kinesiology (Muscle Testing) Queries Optimal Path for Wiring on Garment

This design concern led to the adoption of the application of Applied Kinesiology as a somatic technique to help to evaluate an optimal wiring configuration within the whisper garments. This technique (illustrated in Figure 116), was selected because somatic facilitators within the whisper research project had experiential expertise using Applied Kinesiology, and could design an Applied Kinesiology session to target specific queries regarding optimal body functioning under specific conditions. In order to employ the Applied Kinesiology session, a targeted set of design criteria was prepared.

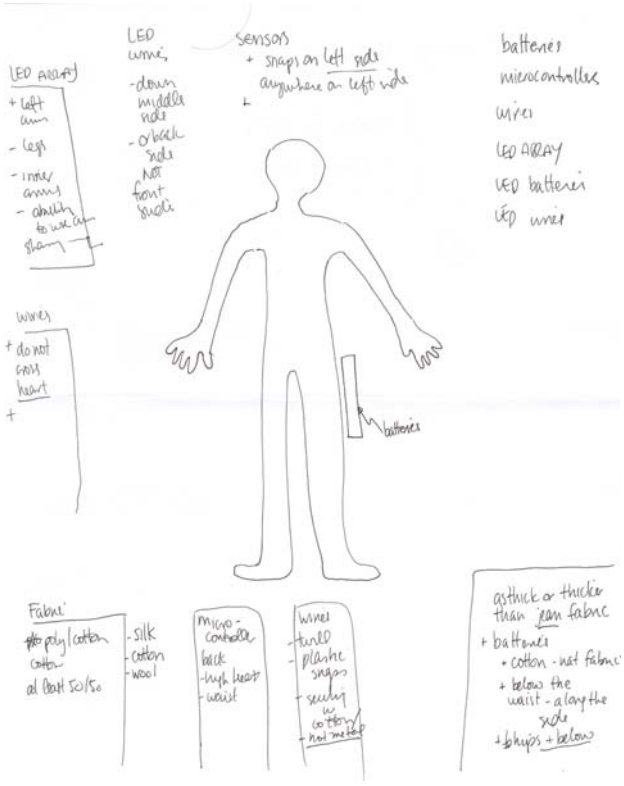

Figure 117. BodyScan Chart Created for Applied Kinesiology Queries

The design criteria was directed towards selecting the best path for the flow of electrical current through the garment, as it is positioned in proximity to the body. The goal was to facilitate optimal design choices regarding location, position and flow of electrical conduits near the body, to support the greatest possible 'health' for the body during interaction. Figure 117 illustrates the 'BodyScan' chart created for Applied Kinesiology queries. Results from the Applied Kinesiology testing provided a series of design decisions that affected garment attributes and constraints. One of the resulting design choices was to move the microcontroller from the centre of the upper back (see Figure 118 left image) to the pelvis area of the lower back (see Figure 118 right drawing). This was based on the assessment of electromagnetic disturbance to the heart organ.

Figure 118. Electricity Map Before and After Applied Kinesiology Testing

Another design choice was to provide a specific depth of 'padding' between electrical wiring and its proximity to the body. These design decisions resulted in a revised 'electricity map' and design requirements for padding electrical activity in relation to optimal functioning of the body. Specifically, the batteries and the microcontroller

required specific padding requirements in order to enable optimal body functioning. These revised design criteria were used in the development of the whisper garment design. An example of before and after wiring requirements for garment design is illustrated in Figure 118. The final whisper garment design was the result of somatic facilitation explored through participant workshop sessions, as well as the somatic facilitated phenomenological inquiry through movement. These design processes were evolved in their application within exhale and *soft(n)*, and became the basis for exploring the practice of somatic connoisseurship as a resource for technology design within HCI.

Figure 119. Final whisper Garment Design Including Padding for Batteries & Microcontroller

8.4.5. Rotterdam space exploration

The final example of somatic facilitation included in this section is based on the design of the whisper exhibition space, located in the lobby of the Rotterdamse Schouwburg Theatre in the centre of Rotterdam. This example serves as an illustration of somatic facilitation that attends to spatial qualities for interaction design. The whisper collaborative design team worked with V2_Lab in two residencies before the final exhibition at DEAF03 in Rotterdam[66]. During the second residency, the whisper design

[66] For full list of collaborators and credits, refer to Author's Acknowledgements in the Front Matter p. 15-17

team occupied the exhibition space for one full week during January 2003[67]. This time period enabled the design team to 'inhabit' the space, observing the flow of people moving through the lobby, exploring spatial relationships, designing and positioning projection areas and testing the effects of lighting, movement and ambient sound levels. During this time period, daily movement explorations took place. These movement explorations supported a design analysis reflected in the categories of flow, sound, projection, body and space. One of the primary goals during the seven days was to 'live' within the space, infusing the sense of space within the somatic value of *inter-connectedness*. The simple *intentional* act of inhabiting the space over a period of time saturated our bodies with aesthetic sensitivity that 'tuned' our attention, state and knowledge. We incorporated the somatic sensibilities of the space *into and through* ourselves[68]*.* Although this description of *indwelling* is imbued with a poetic framing, somatic connoisseurship requires sensibilities that support fine-grained discrimination of experience as material within the spatial design of interaction. Space plays a living role in this system of discernment, supporting and grounding the "potential experience" of future participants. Specific and varied spatial explorations applied somatic facilitation through the "mirror of the self" test as outlined by Christopher Alexander, a method of observation that includes the self within the space:

> I have expressed the view that space must be considered an almost living entity—a kind of stuff, which depending on the recursive structures that are built upon it, becomes progressively more and more alive… different parts of space are *seen* to have different degrees of life. But precisely because the observational method of *Descartes* [third-person observation] forbids us from seeing these facts—or indeed these *kinds of* facts—these observations and these observed facts have dropped out of awareness in the modern era… Where Descartes only allowed observation to focus on the outer reality of mechanisms of the world, my [Alexander's] method requires that we focus on the inner reality of feeling *as well.*[69]

[67] To view the design timeline for the whisper development process, see Chapter 5, Figure 27, 135.
[68] During the Rotterdam Schouwburg residency, the whisper design team was supported by somatic facilitation of Thecla Schiphorst and Susan Kozel with the interaction design expertise of Kristina Anderson. Other design team members including Robb Lovell also had contemporary dance training and were familiar with somatic approaches of 'attunement' to space.
[69] Alexander, C. (2002), op. cit., p. 353.

Figure 120. Schouwburg Spatial Exploration: Garment Prototype in Space

Daily movement explorations included ‘warming the body up’ in the space, as well as focused movement explorations that assessed how the moving body would suggest spatial features such as lighting, spatial boundaries, spatial design for sound domes, projection pools, and legibility of garment LED arrays.

Figure 121. Schouwburg Spatial Exploration: Pools, Window Shades, Sound Dome

The original spatial configuration included café style tables and chairs that were removed in order to facilitate the movement of bodies, sensing and inhabiting the space. Experiments with projector pools that suggested visual concepts for the final installation were prototyped. Sound domes, which localize and focus sound within directed areas, in order to create intimate sonic regions were installed. Movement

explorations continued with the goal of creating a felt sense of bodily scale that could enable a more personal relationship within the larger exhibition space.

Figure 122. Schouwburg Spatial Mock Up including Sound Domes Hung from Grid

The result of this residency was a spatial design and plan for hanging the grid that included projector and sound dome locations. These plans were required so that theatre technical production could prepare the lobby prior to the exhibition opening.

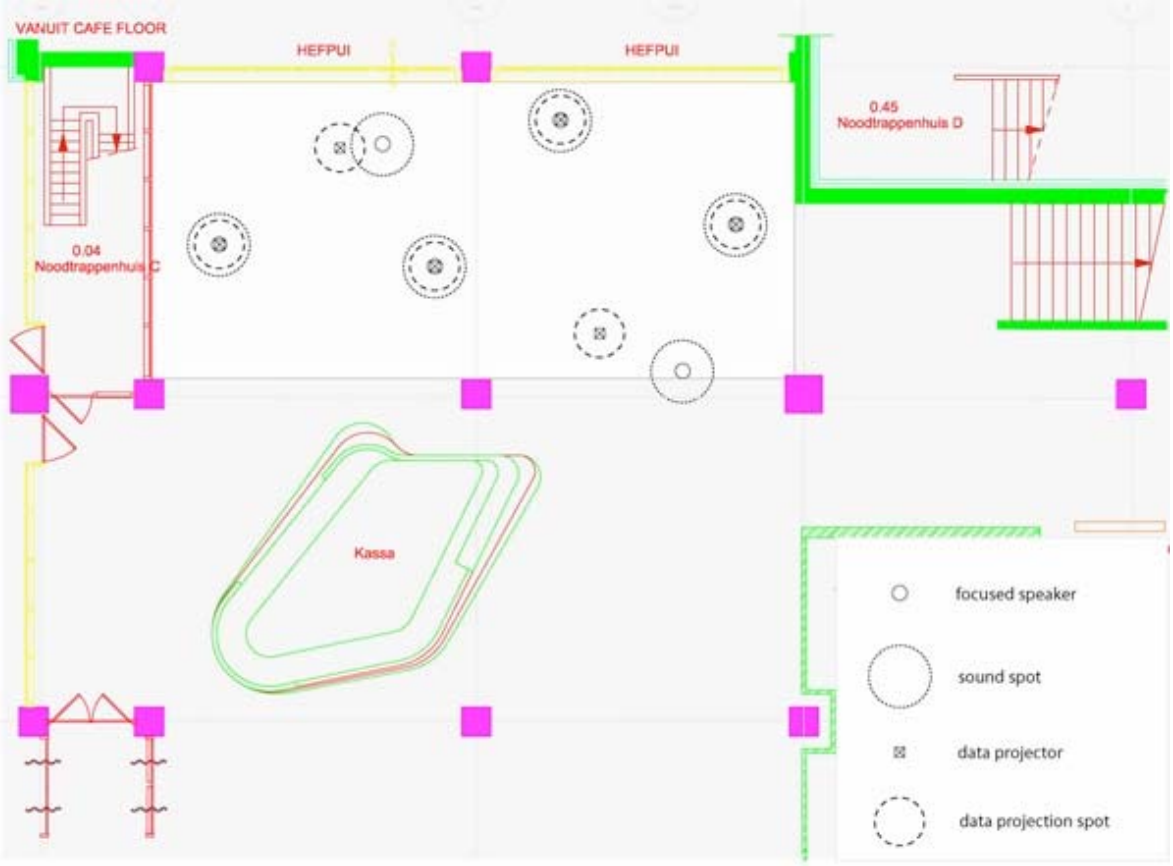

Figure 123. Schouwburg Spatial Plan for whisper Installation Resulted from Design Team's *indwelling* in Space during Week Residency

The whisper residencies provided a week to explore and inhabit the space in preparation for the exhibition, a luxurious time frame in comparison to many other installs. However, observing the space from within the self as suggested by the 'mirror-of-the-self' practice can be applied within many varied time frames, from hours to months. Spatial approaches to somatic *indwelling* that supported design choices for movement and interaction were evolved from these initial tests and then applied to the exhale exhibition during Siggraph Emerging Technologies exhibition in July 2005, and to the *soft(n)* exhibition during April 2007. Somatic facilitation supports technology design that invites participants to 'live' within interactive spaces more fully, attending to the concept of 'wholeness' or inter-connectedness within experience.

8.5 Conclusion

As human computer interaction has responded to the democratization of technology in work, play, home and mobile social networks, it has also extended its collaborators to include domains from the social sciences, humanities, arts and performance, expanding its knowledge and its methods. Like the multiple disciplines that partner within HCI research, somatic facilitation can play a role in the technological design process that is a central theme and outcome of HCI research.

This chapter has discussed insights gained from applying somatic practice to the design of technology and has described how these processes can be operationalized as a design resource within an HCI context. It has illustrated how somatic connoisseurship can apply body-based awareness skills to technology design, from participant workshops to collaborative team development, and from guided participant interaction to prototyping for wearable or tangible computing.

The practice of somatic connoisseurship highlights the significance of somatic facilitation as a role within the technological design process. I have illustrated how the

role of somatic connoisseurship can enrich interdisciplinary design space, bringing new knowledge and practices to the design of technology within human computer interaction.

The research strategy outlined in this chapter has been based on an overarching process of research through art that has explanatory value within the HCI community in the context of design for embodied interaction. These examples have sought to frame the following proposition: if technologies can be used to create a space for the experience of *self-awareness,* thereby providing a rich interplay between movement and sensory expression, then our technologies can support self-cultivation through the development of our *skills of experience.*

The case studies presented within this thesis are interwoven within applications of somatic connoisseurship, from the highest level goal setting, in which somatic values of self, experience, attention and inter-connectedness set a resonant 'tone' that aligns creative intention, to the detailed and specific design choices which form the fundamental material of interaction, aesthetics, technologies, and artifacts of experience.

Within this common case-study framework, the whisper design process was highlighted as an examplar in this chapter. Because the quantity of case study documentation is sizeable, and the sheer number of examples abound, I chose to select a delimited set of examples that could illustrate the interconnected process of somatic facilitation within a coherent design process, in which design choices are multi-layered, complex and inter-connected. This illustrative approach has explanatory value and demonstrates foundational evidence that can be applied within other technological design processes, where somatic goals that seek to support self-experience exist within an overall design framework.

In addition, the somatic approaches that were tested within the whisper design process have direct corollaries in the development of exhale and *soft(n)*. Both exhale and *soft(n)* utilized scripted procedural descriptions in participant workshops to explore and define experiential possibilities. Within the case studies as a whole, somatic connoisseurship established a foundational role in conceptualizing, implementing and refining these artworks.

The concept of self-evidence presented within this chapter, invites a re-thinking of the process of design for technology, one that includes design for the experience of the self. The inclusion of self-evidence and the non-alienated view of technology design supports technology design in which the *self*, embodied within the multiple roles of researcher, designer, artist, and participant or user, is included in the methodological structure of design for technology, both as design goal and as design process.