Soma-Wearable Design: Integrating Somaesthetic Practice and Fashion Design for Somatic Wellbeing

JUNG Heekyoung\textsuperscript{a} and STÅHL Anna\textsuperscript{b}

\textsuperscript{a}University of Cincinnati
\textsuperscript{b}Swedish Institute of Computer Science
* Corresponding author e-mail: junghg@ucmail.uc.edu
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With advanced technologies and raised expectations for the quality of life, research and design attempts are increasing to promote wellbeing. While data-based reflective practice and behaviour change have been a main strategy in supporting technology-mediated wellbeing, we bring the perspectives of somaesthetic practice and fashion design to complement this research scene. Assuming that body consciousness could positively influence self-perception, presentation and performance through clothing, we propose \textit{soma-wearable design} as an alternative approach to explore qualities that elaborate and promote somatic wellbeing. First, we conceptualize constructive links between design for reflection, somaesthetic practice, and style-fashion-dress; and reinterpret the core qualities of somaesthetic appreciation (Höök et al., 2016) for soma-wearable design: 1) transient space for reflection with the body, 2) sensory prompt synched to context, 3) body modification for subject formation, and 4) learning through bodily experience. We articulate these qualities based on the survey of selected fashion objects; apply the soma-wearable design approach to a workshop with fashion design students; and discuss implications about forms, materials and experiential qualities of soma-wearables.

\textit{soma-wearable design; somaesthetic practice; somatic wellbeing; style-fashion-dress}

1 Introduction

With advanced technologies and raised expectations for the quality of life, public interest in wellbeing is growing, expanding related design opportunities from reactive healthcare to proactive self-care. Human-Computer Interaction (HCI) disciplines have mainly taken data-based approaches to make positive behaviour changes by tracking personal activity and biometric data. However, the efficacy of tracking applications is questionable with data overload and user disengagement in reflective practice (Jung et al., 2016); and attention to bodily movement and reflection is growing (Höök et al., 2017), demanding for different approaches to promote mind-body integrated wellbeing. Somaesthetics is a branch of philosophy that grounds the meaning of human experience...
in the bodily presence (Shusterman, 2008), and could provide complementary perspectives to research and design for wellbeing in line with other research motivations that bring the bodily lived experience into human-computer interactions, including affective computing (Picard, 1997), embodied interaction (Dourish, 2014) and bodily imagination through digital media (Loke et al., 2014). We propose that somaesthetic practice and fashion design have a meaningful overlap with their focus on body consciousness; explore their intersection to frame out a design space for soma\wearables; and speculate about desired experiential qualities and related design dimensions for somaesthetic wellbeing through wearables. Specific questions that motivate this study include:

1. How to support somaesthetic practice and somatic wellbeing through wearables?
2. What kinds of experiences could be unfold through soma\wearables for somatic wellbeing?
3. What may be the qualities and design dimensions to define soma-wearable design?

This study draws three approaches to speculate about the questions above: 1) literature review of related perspectives—1-1) design for reflective practice, 1-2) somaesthetic practice in HCI, and 1-3) fashion for subject formation and material speculation with the body, 2) articulation of formal and material qualities of selected fashion objects in relation to somaesthetic reflection and wellbeing, and 3) workshop to explore potential design concepts and implications of soma\wearables. By linking the three perspectives of reflective practice, somaesthetics, and fashion, we conceptualize soma\wearable design as an approach to promote somaesthetic reflection. Based on this conceptual foundation, we analyse selected fashion design examples by articulating how their forms and processes may mediate somaesthetic practice and wellbeing, what may be desired experiential qualities of soma-wearables, and what may be specific design dimensions and attributes to consider in creating those qualities. Lastly, we conduct a workshop to introduce the soma\wearable design approach, explore possible design concepts, and discuss the workshop process and findings.

2  Conceptual Foundation: linking three perspectives
Advancement in information and communication technologies has brought innovations in personal healthcare practice and ecosystems but also introduced new problems including information overload, anxiety and stress (Pickert, 2014). Attempts are increasing in HCI research and practice to explore alternative perspectives in making technology applications including calm technology (Weiser, 1999) for seamlessly weaving technologies into everyday contexts, slow technology (Hallnäs & Redström, 2001) for applying technologies for reflective purposes beyond productivity or efficiency, and positive computing (Calvo, 2014) for making positive changes in individual and social behaviours through computing. This study is in line with these humanistic approaches to contextualize technologies for wellbeing, to support technology-mediated self-care and reflective practice. In this section, we build conceptual links among the three perspectives relevant to the design for wellbeing—1) design for reflective practice, 2) somaesthetic practice, and 3) style-fashion-dress—to propose the soma\wearable design approach as a means of elaborating and promoting somaesthetic reflection and wellbeing.

2.1 Design for Reflective Practice
Reflective practice is thinking about one’s actions and learning from them to change one’s practice for personal and professional development (Schön, 1983). It requires critical attention to the practical values and theories which inform everyday actions (Fook, 2007) and conscious engagement in a process of continuous learning from experience by asking what happened, why does this matter and what are the next steps (Rolfe et al., 1988). Data-based reflective practice to reveal and change one’s behavioural patterns has become a mainstream strategy in the design for wellbeing in HCI. Although the number of consumer products is increasing for tracking one’s activities (e.g., steps), biometric data (e.g., heart rate), and other meta-data (e.g., location), criticism about their efficacy is also growing by addressing that activity data collection does not result in intended behaviour changes without the user’s intrinsic motivation and conscious effort for learning (Baumer et al., 2014; Slovák, 2017). It has been also criticized that those products overly compete for consumer...
attention, often causing technology addiction and anxiety from data overload (Leslie, 2016). And there are more human performances and felt senses that cannot be tracked yet with current technologies (Tholander & Nylander, 2015). As the notion of wellbeing pervades diverse activities beyond healthcare, concerning with various qualities of life from an integrated perspective, it has become more critical to support individuals’ subjective goals and particular patterns of reflection instead of imposing standardized goals of wellbeing such as more fitness activity, work productivity, social connectivity, etc. As an alternative approach to currently dominant data-based reflective practice, we aim to explore how to support conscious reflection and embodied wellbeing from the perspectives of somaesthetics and style-fashion-dress.

2.2 Somaesthetic Practice

Somaesthetics, as a discipline related to bodily perception, performance and presentation, concerns appreciating and cultivating the body as a subject that perceives and learns aesthetic qualities of experience (Shusterman, 2015). Related concepts and methods related to somaesthetic practice could be applied to embrace the qualities of bodily movement, reflection and imagination in design object as well as process. For example, body scanning and body mapping—which will be further described in the workshop section—reinforce mind-body association by sensitizing individuals to attentively listen to their mind and body (i.e., soma) from an integrated perspective and make sense of their experience through focusing and articulating felt senses (Pacheco & Loke, 2017). Based on this shifted focus to one’s somatic being (compared to physical or mental being), we could expand the notion of wellbeing to somatic wellbeing, a status of being appreciative of the qualities of one’s somatic presence and experience in accordance with the rhythms of one’s environment; and speculate about corresponding design approaches to promote noticing and making sense of mind and body association as a critical skill for self-care and reflection (Feldenkrais, 2009). HCI researchers have explored how to engage body consciousness and support somaesthetic practice with interactive systems. Höök et al. (2016) defined related experiences as somaesthetic appreciation and investigated its core qualities to consider in design with interactive technologies: 1) subtle guidance directing attention inwards, 2) making temporal, interactive and spatial spaces for reflection, 3) intimate correspondence with feedback and interactions that follow the rhythm of the body, and 4) providing means to articulate the experienced bodily sensations. These qualities provide a constructive foundation for exploring how interactive systems could guide body and mind reflection and creating new contexts and ecosystems to promote subjective wellbeing.

2.3 Style-Fashion-Dress

Fashion affects individuals’ body consciousness as a personal and social medium through which to perceive and present the body. Fashion, beyond producing clothes and appearances, but also negotiates subject positions (e.g., gender, ethnicity, class) by navigating through power relations with multiple dimensions: fashionable dress vs. fixed costume, global vs. ethnic, the future vs. the past, time vs. space, agency vs. structure, dressing to belong vs. dressing to differentiate, mainstream vs. street style, production vs. consumption (Kaiser, 2013). Individuals mix and match different elements to formulate temporary expressions about who they are or are becoming by fashioning their body. According to Tulloch (2010), style-fashion-dress is a complex system that recognizes the parts and wholes of processes and concepts: style is a social process in which narratives of the clothing choices are collectively in flux with time, and also an agency in the construction of self through the assemblage of garments, accessories, and beauty regimes; fashion encompasses more than clothing style, spanning food and furniture preferences, popular culture, language, technology, or other dimensions of culture and change; and dress is material forms of body modifications and body supplements. The system of style-fashion-dress pervasively influences one’s subject formation as well as lifestyle in the web of broader social and cultural values, shaping the notion of wellbeing. In particular, the material processes and symbolic values of style-fashion-dress could inform the soma wearable design approach with their impact on self-perception, performance and presentation, which will be further elaborated in the next section.
The conceptual foundation for the soma-wearable design approach, which is built across the three perspectives above, sets out the following assumptions of this study:

1. Body consciousness—awareness of one’s condition through the lens of mind and body association—can be the first step toward self-reflective practice for wellbeing.
2. Articulating felt senses and their meanings could be part of reflective practice for wellbeing, potentially influencing self-perception, presentation and performance in social context.
3. Somaesthetic reflection requires sophisticated skills and training for noticing and articulating what one feels in their body in relation to the environment and what it means to oneself.

3 Toward Soma-Wearable Design Approach

In this section, we review fashion theories and selected fashion objects to further elaborate the soma-wearable design approach. We speculate how the metaphor of the body is continuously fashioned and refashioned as a compelling and revealing means for subject formation and how related qualities of bodily experience could conceptualize soma-wearable design for self-reflection.

3.1 Implications from Fashion Theories and Objects

We first review the influence of fashion on subject formation, its creative ecosystem and provocative impact in (re-)constructing the body from physical, social and cultural perspectives.

3.1.1 Influence on Self-Perception, Presentation and Performance

Clothes in contemporary society have been developed from a practical asset that protects the body to a social marker that affects the way we see ourselves as well as present ourselves to others. Fashion and style elements are critical in wearable design, often more than utilitarian values, in terms of how wearers perceive and present themselves through clothing choices in their social and cultural contexts. Enclothed cognition is a term to describe the effect of clothing on cognitive process (Adam & Galinsky, 2012): when a wearer understands the symbolic meaning of the clothes and physically wears them, the clothes can impact the wearer’s emotion and performance, putting the wearer in a different psychological state. The concept does not fully explain how it came about, but it suggests that it will be worth exploring various ideas (Blakeslee, 2010). Some practical tips are shared to select clothes to change the way people think as intended, for example, suits to power up, casual wear for creativity, gym clothes for healthy behaviours, uniform for a particular task performance (i.e., white lab coat effect), luxury goods to show political status, dress or accessories with fun graphic details for positive thinking (Sarda-Joshi, 2016; Gowans-Eglinton, 2017), and more. We need to understand more about how clothing choices affect our self-image, performance and the impression that we convey to others and in turn, the way in which people behave towards us.

3.1.2 Driven by Changes and Remixed through Creative Ecosystems

Fashion design is largely driven by trends from haute couture industry, artists and celebrities influence, and labels associated with social class. A desire for the next new change drives fashion industry. Fashion design does not only support new expressions of desired self-images, but also creates new experiential values with novel expressions, challenging the modern design mantra of form follows function. In fashion industry, style and performance (i.e., form and function) are inseparable, creating synergetic influence on the wearer’s perception of self-image and performance. Many sportswear companies acknowledge the fashion side of experience with sport (Mellery-Pratt, 2015), and often collaborate with athletes and celebrities to embrace their performance and achievement in the style and symbolic meaning of fashion products (Yotka, 2016). The style aspect of a fashion product is often criticized as a superficial image that could misguide or deceive its functionality. We aim to demystify the biased notion of style and fashion by investigating the synergetic relationship between form and function of wearables. Although fashion styles are largely driven by the quest for newness, some form factors are repeatedly used to satisfy certain functions, reified as iconic elements for certain genres of activity wear (e.g., leggings for yoga, laced top and layered skirts for ballet). These style elements, not only supporting the performance of
physical activities, also influence ritual qualities that condition the wearer’s mind, making the experience more engaging. Iconic style elements are remixed with other design elements, creating new fashion trends or labels that make a statement on certain lifestyles. The changes in fashion styles further speed up today, expanding through creative ecosystems of connected user experiences across different product categories and communication platforms. Collaborations between fashion designers and artists, architects and celebrities create unique symbolic and style values to fashion objects with greater impact on popular culture and product ecosystems.

3.1.3 Material Speculation for Re-imagining the Body

Wearable forms and styles, with their intimate and expressive influence on the body, reimagine our bodily presence in the world with new material and fabrication technologies. Many fashion designers question relationships between the body and the society through exploratory material processes and expressions. Hussein Chalayan performs stories of clothing that transforms identities through precise objects that are very body conscious or create an alternative (Bateman, 2016): e.g., six models wearing chadors of varying lengths—from fully clothed to totally nude—as a statement on the oppression of traditional clothing on Muslim women in SS98; a coffee table transformed into a dress as an experiment with cutting techniques in AW00 (Figure 1) (Stansfield, 2016). Joanna Berzowska explores a wider range of material properties in the development of wearable, physical computer interfaces beyond screen or wrist interactions. Her work embraces the soft, playful and magical aspects of electronic textiles, so as to better adapt to the contours of the human body and the complexities of human needs and desires, even speculating about gender dynamics and energy generation through the body (Berzowska, 2010). Iris Van Herpen is well known for her use of materials as diverse as metal umbrella ribs, industrial yarns, woven metal, leather strips, and transparent acrylic. Credited with introducing 3-D printing to fashion, she blends hi-tech processes with traditional handwork, creating imaginative sculptural garments (Kapfunde, 2015).

With the approaches of these fashion designers, we intend to highlight that 1) material and technical experiments in fashion design are interweaved with speculative narratives about physical, social, cultural and political dimensions of the body and 2) those experiments rest at the intersection of art, engineering, architecture and science. Their integrative approaches allow them to construct composite textiles with complex functionality and sophisticated behaviours and explore a broad

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1 Coffee Table Skirt by Hussein Chalayan. http://oxot.com/table-skirt/ and http://chalayan.com/about
2 Captain Electric and Battery Body by XS Lab. http://www.captain-electric.net
range of computational expressions by blending them with traditional handwork. Their works using emerging technologies are proving that the basis of fashion technology is more than just blinking lights but freeing designers to use their materials in ways never imagined, for example, by bringing architectural approaches to composite textiles and create shapes, folds and scales of clothing. Fashion design, as an integrative form of creative experiment, offers unique perspectives to explore soma-wearables with its focus on body consciousness through material speculation.

3.2 Core Design Qualities of Soma-Wearables

Articulation, a method in cultural studies, enables understanding of subject formation through the system of style-fashion-dress, a process of navigating alternative self-perceptions and presentations through clothing (Kaiser, 2013). The method of articulating involves breaking down a whole, which may appear harmonious, and identifying differences, contradictions or fractures in the whole by considering new possibilities and formations (Grossberg, 2010). We apply the method of articulation to rearticulate unique formal and material qualities of selected fashion objects as potential qualities of soma-wearables by speculating how they could provide alternative bodily experiences. Although the selected examples were not designed for the purpose of somaesthetic reflection, their alternativeness allows creative reinterpretation of their forms and meanings for such context. The following qualities and design dimensions are not definitive or exclusive to each other. Instead, by specifying those formal and experiential qualities of the examples, we intend to conceptualize the soma-wearable design approach and further discuss its implications for research and practice.

3.2.1 Transient space for connecting reflection and expression: hiding or revealing

A space for reflection is one of the core qualities in somaesthetic appreciation design, enabling and guiding attention inwards to focus on one’s bodily sensation with minimal distraction. The scale of wearables affords a limited but transient space around the body by connecting inward focusing and outward expression of perceived sensations. The personal boundary set by clothing can be adjusted with transformative structures, extending the self-reflection to self-presentation in public context, which would influence back on self-perception and performance according to the theory of enclothed cognition (Figure 2). The transient space could be designed somewhere between closed (private) and open (public) through different clothing forms to hide or reveal one’s reflection status—its instant or accumulative effect—through soma-wearables.

Figure 2 A conceptual space for somaesthetic reflection through soma-wearables: the status and effect of focusing inwards could be expressed outwards in wearable forms, affecting back self-perception, presentation and performance. This would reframe the reflective practice into a reciprocal process for noticing one’s bodily sensation in relation to the environment and articulating their instant or accumulative relationship through wearables for intended perceptual/behaviour changes.
3.2.2 Sensory prompt synched to context: stimulating, alleviating or responsive

The quality of guiding attentions inwards could be combined to different sensory prompts for stimulating, alleviating or responding to the wearer’s physiological or contextual condition. For example, Kino⁴ (Deahl, 2017), a kinetic accessory roaming on clothing, can stimulate the wearer’s inward focusing as a tactile prompt traveling on the body; Sensewear⁵ (Rhodes, 2015) can alleviate sensory disorders by engaging the wearer in interacting with simple shapes and textures of the clothing (Figure 3); and NADI X⁶, smart yoga pants, can respond to the wearer’s posture for fitness guidance and feedback (Feitelberg, 2017). Some wearable applications display the effect of perceived sensations, further affecting the wearer’s emotion or performance: AWElectric⁷ animates emotionally charged goose bumps and shares the thrill with visual and vibrotactile feedback (Neidlinger et al., 2017); Facebook Vest inflates according to the number of likes received on Facebook posts (Wainwright, 2010). Physiological and psychological impact of sensory prompts on mood changes—either instantly or accumulatively—needs to be further investigated with different sensory prompts and display elements embedded in wearables.

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Figure 3 Sensewear (Photo Courtesy of Emanuela Corti and Ivan Parati). Corti and Parati are faculty members at Ajman University, College of Engineering (UAE) and founded Witsense srl, a start-up to develop smart wearables with embedded sensors for collecting vital data and actuators for activating garments and accessories.

3.2.3 Body modification for subject formation: supporting, constraining or augmenting

Body modification and supplement is a fundamental function of clothing, serving various purposes from body protection to decoration. Sometimes bodies are modified through purposeful training over time as in the case of ballerina’s feet and toes. Pointe shoes is critical in ballet practice as an extension of dancers’ bodies and an essential tool of expression (Kaufman, 2017). They equip the wearers to do what no human is designed to do by constraining their body shapes or movements for particular training. Purposes and approaches for body modification become diversified with advanced technologies. GS3⁸ holds up an injured spine and flexibly adjusts to its recovery status beyond statically supporting it (Chaya, 2017); prosthetics can augment human perception and performance with new physical additions to the body, as in the cases of Sonifica⁹, the implanted instrument to make sound performance with the body (Goldemberg & Zalcberg, n.d.) and the third thumb¹⁰ to see what it may be like to live with an unusual body part (Wilson, 2017).

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⁵ Sensewear Clothing by Crvnd Design Collective. http://sensewear.clothing
⁶ Wearable X | Fashion technology company building future of clothing https://www.wearablex.com
⁷ AWElectric | SENSOREE. http://sensoree.com/artifacts/awelectric/


3.2.4  *Learning through the body: improvised performance or practiced skills*

Body modification is not only about static, passive addition to the bodies, but also involves changes in bodily skills and abilities through the interplay between the bodies and the wearable (or implanted) artefacts. Any bodily experience involves movement—small or large, internal or external—that has both reflective and performative aspects. While some interactive systems for somaesthetic appreciation like the Soma Mat and the Breathing Light (Höök et al., 2016) support stable self-reflection (and learning about one’s somaesthetic perception) with minimal movement and distraction for inward focusing, the notion of soma- wearables aims to explore dynamic bodily experiences that involve learning through alternative and conscious movements: e.g., *Sway*[^11], a mindfulness app with a movement tracker, transfers the qualities of Tai-Chi to an interactive experience for practicing mindful movement (Cheng, 2017); *hipDisk*[^12], a set of two layered disks worn around the waist, enables the wearer to discover new body-space relationships by generating sound according to the wearer’s movement in the space (Wilde, 2012); and *Bubble Jumper*[^13], an augmented body suit, creates a new kind of sport play and related rules and skills by boosting the wearer’s strength and protecting players when they crash into each other (Kim, 2017).

We elaborated potential experiential qualities of somaesthetic appreciation through the lens of wearables based on the selected examples—e.g., being attentive to one’s bodily sensations through sensory prompts for reflection, being synched to one’s environment and other entities for harmonious presence, experimenting with unfamiliar body modifications or movements, exerting to practice unique bodily skills and develop somaesthetic knowledge, and ultimately expanding one’s perceptual and experiential horizon through body consciousness (Höök, 2010). These qualities collectively consolidate the definition of somatic wellbeing, a status of *being appreciative of the qualities of one’s somatic presence in accordance with the rhythms of one’s environment*, and elaborate the soma-wearable design approach to support it accordingly. In the next section, we report the process, outcomes and implications of a design workshop that we conducted to see how the soma-wearable design approach could be applied in design practice.

4  Soma-Wearable Design Workshop

We conducted a design workshop with 14 fashion design juniors to introduce the soma-wearable design approach with its desired qualities, and observed how the approach is interpreted by them. The workshop consists of three parts: 1) body scanning and mapping for individual sensitization, 2) orientation of the soma-wearable design approach, and 3) group ideation and discussion. The students were asked to complete the first part individually before attending the workshop, provided with an audio script for body scanning and a template for body mapping. The soma-wearable design approach was introduced afterwards (for about 1 hour) so that its concepts and examples would not influence the students’ ideation. After the orientation, the students shared their thoughts about body scanning and mapping and ideas for soma-wearables by sketching and body storming (for about 2 hours).

4.1  Body Scanning and Body Mapping

Body scanning is a method for listening to one’s mind and body through a guidance for directing attention inwards in an environment where distraction is eliminated. The method, similar with meditation, could be applied for conditioning oneself for creative practice and design ideation (Lee, Lim & Shusterman, 2014). Richard Shusterman derived the following principles for body scanning from Feldenkrais methods (Feldenkrais, 2010): 1) divide body parts, 2) focus on one part at a time, 3) question about a felt sense, 4) contrast sensations felt from different body parts, 5) relate the position and movement of the body to felt senses (i.e., proprioception), and 6) associate felt senses with related experiences. We provided the students an audio script that guides body scanning to

inspect their body parts separately from bottom to top, let sensations emerge from each part, and make sense of them as inspirations or narratives for reflection as well as ideation. Body mapping is used as a means for articulating felt senses from body scanning. The students were asked to list three senses that lasted in their body and associate each to a corresponding body part by marking them in the body outline (Figure 4).

![Figure 4 Examples of body mapping in the given template.](image)

We observed what kinds of felt senses the students came up with after body scanning and how they associated those senses with different body parts and develop wearable concepts. The students used the following descriptors to articulate their felt senses: tingly, buzzy, crawly, loose (fingers, legs), pulsing, ringing (head, chest), pouring out, caved (chest), tense, pain, ache (shoulder, back), floating, swimming, sinking, synching, falling, heavy, comforting, peaceful, relaxed (whole body), numb, warm, cool, etc. Many of the students described some changes in their sensations felt before and after body scanning, for example, from relaxed to tingly to numb, from cold to warm, from comforting to sinking and heavy, and so on. It is hard to generalize the pattern of changes, but it is noticeable that even in a short and static body scanning session, individuals went through dynamic feelings in different parts of their body, reflecting varying depths of their focusing and articulation. Many felt senses are associated with some narratives in relation to specific environments or material qualities (e.g., felt like swimming, floating, sinking in water) and background sound in the guide script (e.g., pulses felt through the body following the rhythm of the sound, chest felt like caved by the resonating sound). It was common for the participants to focus on negative feelings such as pain, stress or shaking (from fatigue), especially around the neck, shoulder and back. Few mentioned about emotion-free descriptors like colours or temperatures.

### 4.2 Ideation and Discussion in Groups

After describing and sharing their felt senses, the students discussed in four groups about how to convert those sensational qualities to wearable design and what they would mean in terms of somaesthetic reflection and wellbeing. Because they are trained fashion design students, hand drawn or Photoshop sketching and body storming methods were efficient enough for them to ideate and communicate initial concepts without using tangible, craft materials. Design concepts explored were categorized into three themes: 1) sensory stimuli for therapeutic experience, 2) material imagination for body support, and 3) fidgeting through the body.

#### 4.2.1 Conceptual theme 1: sensory stimuli for therapeutic experience

Providing sensory stimuli (e.g., heat, gentle pulse, electric shock) for therapeutic or meditating experience was one of the recurring concepts. This theme reveals that many students naturally focused on sensations related to stress, fatigue, pain or headache after body scanning. Most ideas were about embedding static sensory prompts (mostly heat) into specific parts of clothes (e.g., a jacket with heating pads embedded around the shoulders, head warp with heating/cooling effects,
electrotherapy through clothing), which seem to be largely influenced by the principle of division in body scanning. By focusing on a specific body part at a time, the students were able to compare and contrast different senses felt in each part of the body, identified which parts they felt more or less stressed, tired or painful; and applied rather direct interventions to corresponding areas of clothes.

**Figure 5 Soma-wearable ideas explored in the workshop: Photoshop sketch of head wrap for stress release (top-left; sketch by Nathan Haberthy), mind mapping for ideation (middle-left), jumpsuits with strips for fidgeting (middle-right; sketch by Niyah Jackson), multiple layers for the feeling of compression (bottom-left), and oversized clothes with soft materials for the feeling of comfort (bottom-right; sketch by Sarah Elliott and Julie McGrath).**

4.2.2 Conceptual theme 2: material imagination for body support and pain relief

Supporting a desired body posture or relieving pain was another conceptual theme. As briefly mentioned, many students focused on negative sensations, such as chronic pain (mostly in the back and neck), sore muscles or joints (around shoulders, arms, and legs), headache and shaking hands; and immediately thought of physical interventions such as body supporting structures and/or layers that could simulate the feelings of compression, expansion or massaging. Some ideas were discussed about how to connect different parts of the body (e.g., head and shoulder, back and thighs). It is noticeable that different formal patterns and structures were explored by graphically dividing and connecting multiple parts of the body (e.g., a head wrap that goes across the temples, a neck support that connects the head and the shoulder, a jewellery in between neck and chin) for the effect of
redirecting or distributing the pain from one part to relatively stable and relaxed parts. Other ideas were discussed regarding how to simulate a corresponding material experience through wearables, for example, how to make the wearer feel like sinking in or synched to water, gently compressed like human hugs, moving through clay by wrapping the knee joints with manoeuvrable textiles (solid but flexible), etc. Similar ideas include a body wrap that reduces and absorbs back pain, a compression shirt that helps the wearer to keep the upright posture, and gloves that help alleviate arthritis.

4.2.3 Conceptual theme 3: connecting and fidgeting through the body

In relation to the first and second themes, the concept of making a transient space for bodily reflection and expression was explored in different wearable forms, simply from oversized clothes to multiple layers, inflatable clothes, transformative hoods, and strips to expand and collapse clothing layers. These transformative elements define the third conceptual theme that divides different parts of the body and re-connects them to enable unusual and un-purposeful movements around the body, which are easily associated with fidgeting for releasing stress and anxiety. Specific wearable concepts include a jumpsuit with fabric strips that connect arms with legs, concavity in pockets back of thighs, snuggle layers under thighs, some weights between outer and inner layers, heat up by kinetic movement, and jewellery or tassels to play with.

4.3 Reflection

Due to the limited time of ideation and the specific background of the students in fashion design, most ideas were discussed around the first and second themes that directly build upon their felt senses after body scanning to respond to them with therapeutic interventions. Still it was interesting to observe how imaginations and narratives emerging from body scanning drove material speculation for wearables by elaborating on particular experiential qualities (e.g., sinking in water, walking through clay). The students shared their reflection that the body scanning principles of division and contrast introduced them alternative ways of thinking about the connection between multiple body parts and opportunities for playing with and moving around their body through clothes. In group discussions, questions were raised regarding how to abstract the sensations that they felt from body scanning (instead of literally simulating them or responding to them with therapeutic interventions), how to make others experience similar sensations that they felt through clothing, and how clothing could enable new bodily movement, reflection and performance. Although the questions were not fully answered, the discussion revealed potentials of the soma-wearable design as an approach to embrace the body as a source for design ideation as well as an object for reflective and expressive fashion. While this first workshop mostly resulted in discussions about wearable forms and materials that make a space for reflection and provide sensory prompts for somaesthetic appreciation, their influence on self-perception, presentation and performance need to be further investigated later.

5 Discussion and Conclusion

This study proposes the soma-wearable design approach to complement current behaviour tracking approaches in the design for wellbeing. Assuming that body consciousness could positively influence self-perception and performance through clothing, we integrated the perspectives of somaesthetic practice and fashion design to conceptualize the soma-wearable design, and elaborated desired qualities of soma-wearables and corresponding design dimensions by re-articulating selected fashion objects in the context of somaesthetic reflection and wellbeing. The four qualities—1) transient space for reflection, 2) sensory prompt synched to context, 3) body modification for subject formation, and 4) learning through the body—frame out a design space to promote somaesthetic wellbeing through bodily reflection, experiment and learning. Different wearable design concepts were explored from the workshop with fashion design students, mostly around the qualities of transient space for reflection and sensory prompt. The result and student feedback indicate that the other qualities of body modification and performance to augment one’s experience horizon are relatively new design dimensions and hard to be explored only within a limited time in this workshop.
context. We see this as a meaningful opportunity to further investigate, especially about the constructive loop between self-reflection and subject formation through body consciousness.

Although fashion design can bring useful perspectives to contextualize somaesthetic practice with intimate and direct material influence on the body, we also understand that superficial style elements and too much attention to public presentation of the body could prevent one from getting into a deeper flow of self-reflection and subject formation. In this vein, the conceptual qualities and design dimensions need to be further investigated in terms of sophisticated wearable forms and styles that are neutral (i.e., not implying any subject stereotypes) and ordinary (i.e., not too sculptural like special costumes), but still evocative of bodily experience and reflection.

We expect the soma-wearable design approach would envision a promising potential of somaesthetics and fashion perspectives in the design for wellbeing by elaborating and promoting somatic wellbeing through material speculations. We plan to conduct more soma-wearable design workshops with diverse groups beyond design students to explore more soma-wearable concepts by refining the proposed methods and intended qualities. In addition, we will also conduct a longer study to investigate the constructive link between somaesthetic reflection and self-perception and performance with specific application scenarios (e.g., soma-wearable for mood change).

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6 References


About the Authors:

**Heekyoung Jung** is an Associate Professor at University of Cincinnati with a Ph.D. in HCI from Indiana University. She has worked in the area of interactive system design, investigating formal, material and symbolic qualities of digital experiences.

**Anna Ståhl** is a Senior Researcher at Swedish Institute of Computer Science with a Ph.D. in HCI from KTH. She has worked in the area of design research and bodily interaction, investigating qualities to deal with body awareness through technology.