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

With growing distractors and anxiety from contemporary technologies, attempts are increasing in human-computer interaction design to support reflective practice for healthier mind and body. As a complementary perspective to current data-based approaches in the design for wellbeing, we bring concepts relevant to fashion and style to this research scene. Assuming that body consciousness could positively influence self-perception and performance in relation to clothing, we propose *soma-wearable design* as an approach to explore qualities that can promote somatic wellbeing. First, we conceptualize constructive links between Somaesthetic practice, design for wellbeing, and fashion-style-dress; and interpret the core qualities of Somaesthetic appreciation (Höök, et al., 2016) into 1) *transient space for reflection*, 2) *sensory prompt synched to context*, 3) *body supplement and modification for subject formation*, and 4) *performing through the body* for soma-wearable design. We analyse related design examples to articulate the aforementioned qualities with specific design attributes; apply the soma-wearable design approach to a workshop with 14 fashion design students; and discuss implications regarding forms, materials, and experiential qualities of soma-wearables.

*Somaesthetic practice; soma-wearable design; style-fashion-dress; somatic wellbeing*

1. Introduction

Attention to bodily movement and reflection is increasing in relation with growing interest in healthier lifestyle and mind-body integrated wellbeing. Somaesthetics is a branch of philosophy that shifts the focus of aesthetic experiences to our bodily presence in the world (Shusterman, 2008). Attempts are increasing in human-computer interaction design and research to support Somaesthetic practice with interactive technologies in relation to the motivations of affective computing (Picard, 1997), embodied interaction (Dourish, 2014), bodily imagination (Loke, Khut, & Kocaballi, 2014), and data-based reflective practice (Choi, et al., 2014). We propose that Somaesthetic practice and fashion design have a meaningful overlap with their focus on body consciousness; explore the intersection between them to frame out a design space for *soma-wearables*; and speculate about desired qualities and related design dimensions for Somaesthetic appreciation through wearables. Specific questions that motivate this study are:
• How to support Somaesthetic practice and somatic wellbeing through wearables?
• What kinds of experiences are we aiming to unfold through soma-wearables?
• What maybe qualities and design dimensions to define the soma-wearable design?

This study takes three methods: 1) literature review to define the conceptual foundation for the soma-wearable design, 2) articulation of selected fashion objects to specify core qualities and dimensions of the soma-wearable design, and 3) a workshop to explore potential concepts of soma-wearables and implications for future work. Specifically, we first reviewed 1-1) design attempts relevant to Somaesthetic practice, 1-2) issues in the design for wellbeing through reflective practice, and 1-3) fashion design perspectives related to subject formation through clothing choices and material speculation with the body. By linking the three perspectives, we conceptualize the soma-wearable design approach to promote Somaesthetic reflection and wellbeing. Based on this conceptual foundation, we analysed selected fashion design examples by articulating how they may support Somaesthetic practice, what maybe desired qualities of soma-wearables, and what maybe specific design dimensions and attributes to consider. Lastly, we conducted a design workshop by introducing methods and concepts relevant to the soma-wearable design, explored possible design concepts, and discussed about the process and results of the workshop.

2. Conceptual Foundation: Linking Three Perspectives

Advancement in information and communication technologies has brought innovations in personal healthcare applications but also introduced new problems including information overload, anxiety, and stress. Attempts are increasing to explore alternative perspectives to the use of technology, for example, with the notions of calm technology (Weiser, 1999) for seamlessly weaving technologies in everyday routines, slow technology (Hallnäs & Redström, 2001) for using 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, specifically for technology-mediated mind and body care and reflection. In this section, we build conceptual links among the three perspectives relevant to the design for wellbeing—1) Somaesthetic Practice, 2) Design for Reflection, and 3) Style-Fashion-Dress—to propose the soma-wearable design approach for Somaesthetic reflection and wellbeing.

2.1. Somaesthetic Practice

Somaesthetics is a branch of philosophy that orients one’s worldview to his or her bodily presence, applied to design methods and systems to raise body consciousness and support appreciation of bodily movement, reflection, and imagination (Loke, Khut, & Kocaballi, 2014). HCI designers and researchers are exploring potentials of Somaesthetic practice as an alternative way of engaging human body in interactions with computing systems and supporting Somaesthetic appreciation through technology interventions (Höök et al., 2016). Somaesthetic practice reinforces the mind and body association in making sense of aesthetic experiences, and can be applied for creative practice (e.g., writing, drawing) by focusing and articulating felt senses (Pacheco & Loke, 2017). Specific methods such as body scanning and body mapping—which will be detailed in the workshop section—can also support Somaesthetic reflection and inform the design for somatic wellbeing, which involves awareness of one’s body and mind condition in accordance with the rhythms of one’s environment and transformative reflection through bodily learning and knowing. The core qualities of Somaesthetic appreciation design investigated by Höök et al. (2016) include: subtle guidance directing attention inwards; making temporal, interactive and spatial spaces for reflection; intimate correspondence with feedback and interactions that follow the rhythm of the body; 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, opening up opportunities for creating new contexts and ecosystems to promote wellbeing.
2.2. Design for Reflective Practice

There are many consumer applications for tracking one’s activities (e.g., steps), biometric data (e.g., heart rate), and other meta-data (e.g., location), revealing corresponding behavioural patterns and supporting intended behavioural changes. In spite of the accuracy and efficiency of those tracking applications, there are more human performances and felt senses that cannot be tracked yet with current technologies (Tholander & Nylander, 2015); and their interventions are yet too passive to influence intrinsic motivation for self-care and -reflection mostly by prescribing standard health goals and reflective processes. User engagement in data-tracking, reporting, and navigating is limited, hardly resulting in transformative reflection (Slovák, 2017). As an alternative to data-based behavioural changes, a common approach to reflective practice in HCI design, we explore how to raise body consciousness and support bodily reflection and imagination by re-interpreting the core qualities of Somaesthetic appreciation for wearable design from fashion design perspectives.

2.3. Fashion-Style-Dress

Fashion is not only about producing clothes and appearances but also about negotiating subject positions (e.g., gender, ethnicity, class) and navigating through power relations with the following dimensions: fashionable dress vs. fixed costume, western dress vs. the rest, 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. Style is 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 beyond personal contexts of life, and could provide meaningful perspectives to the design for wellbeing. In particular, its material process and impact in contemporary society can inform the soma wearable design approach based related theories regarding the impact of clothing on self-perception, performance, and presentation.

The conceptual foundation for the soma-wearable design, which is built across the three perspectives, sets out the following assumptions for 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. The reflective practice requires sophisticated skills and practice for focusing and articulating what one feels in their body (Feldenkrais, 2009) and what the feeling would mean to oneself and others (Gilbert & Choden, 2014).
3. Articulating and expressing the felt senses and their meanings is part of the reflective practice, and influence self-perception, performance, and presentation in social context.
4. Wearable forms can provide a transient space around the body for inward focusing and public expression that can bring transformative reflection for somatic wellbeing.

3. Toward Soma-Wearable Design Approach

In this section, we review fashion theories and selected fashion objects to specify the soma-wearable design approach. We speculate how the metaphor of a body is continuously fashioned and refashioned as a compelling and revealing means for subject formation and how related approaches could be reinterpreted to conceptualize the soma-wearable design with desired qualities and corresponding design dimensions.

3.1. Implications from Fashion Theories and Objects
We first review the influence of fashion on subject formation, its creative ecosystem, and its provocative impact in reflecting about the body from physical, social, and cultural perspectives.

3.1.1. Influence on Self-Perception, Performance, and Perception
Clothes in contemporary society have 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 (Fodder, n.d), 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 (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 the practice of contemporary fashion design. 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 synergistic 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, 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 across disciplines.

3.1.3. Material Speculation for Modifying and Imagining the Body
Wearable forms and styles of fashion, with their intimate as well as expressive influence on the body, are further explored with new material and fabrication technologies to reimagine our bodily presence in the world. Many fashion designers question about relationships between the body and the society through exploratory material processes. 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 (SS98);
a coffee table transformed into a dress as an experiment with cutting techniques (AW00) (Stansfield, 2016). Joanna Berzowska explores a wider range of material properties in the development of wearable, physical computer interfaces beyond screen, 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 (Berzowska, 2010). Iris Van Herper 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 seamlessly blends hi-tech processes with traditional handwork, creating imaginative sculptural garments (Kapfunde, 2015).

With the motivations and approaches of these fashion designers, we want to highlight that 1) material and conceptual 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 to explore broad range of computational expression, technologies, and materials 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, freeing designers to use their building 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 authentic perspectives to explore a design space for soma-wearables with its focus on body consciousness through material process.

![Figure 1 Coffee Table Skirt ©Hussein Chalayan (left), Captain Electric and Battery Boy ©Joanna Berzowska (middle), and Crystallization ©Iris Van Herpen (right)](image)

3.2. **Core Design Qualities of Soma-Wearables**

*Articulation*, a method in cultural studies, enables understanding of *subject formation* through style-fashion-dress, a process of navigating alternative self-perceptions and presentations through clothing (Kaiser, 2013). The method of articulating involves breaking down 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 qualities of selected wearable examples as potential qualities of soma-wearables by speculating about how they could provide alternative bodily presences and experiences for Somaesthetic reflection. Although the selected examples were not designed for that purpose, their alternativeness allows creative re-interpretation of their forms and meanings in the context of Somaesthetic appreciation. The following qualities and design dimensions are not definitive or
exclusive to each other. Instead, we intend to conceptualize the soma-wearable design approach with specific qualities for further discussion about their application in practice.

3.2.1. **Transient space for reflection: between focusing and expression**

A space for reflection is one of the core qualities for Somaesthetic appreciation, enabling one to listen to his/her bodily sensation with minimal distraction. The scale of wearables affords a limited but transient space around clothing that connects inward focusing and expression of any sensation during (or after) reflection. The personal boundary set by clothes can be adjusted with transformative structures, extending the self-reflective experience to public expression and representation, and influencing back on self-perception and –performance (Figure 2). The space could be somewhere between closed or open through different clothing forms, which accordingly could hide or reveal one’s focusing and reflection status.

![Figure 2 Transient space for Somaesthetic reflection through soma-wearables](image)

3.2.2. **Sensory prompt synched to context: stimulating, absorbing, or responsive**

Inward focusing could be applied to different applications of bodily reflection by stimulating, absorbing, or responding to the wearer’s physiological or contextual condition depending on how the prompt would be triggered or synched. For example, Kino (Deahl, 2017), a kinetic accessory roaming on clothing (and the body) can stimulate the wearer’s inward focusing as a hard-to-ignore tactile and visual prompt; Sensewear (Rhodes, 2015) can absorb sensory overload by engaging the wearer in playing with simple shapes and subtle textures of the clothing (Figure 3); and smart yoga pants respond to the wearer’s posture for guidance and feedback (Wearable X, n.d.). There are also wearable applications that display the effect of sensory prompts in connection with the wearer’s status: AWElectric animates emotionally charged goosebumps, amplifies them and shares the thrill (Neidlinger, et al., 2017), the Facebook vest inflates according to the number of likes received on facebook posts (Wainwright, 2010). Psychological and psychological impact of sensory prompts on mood changes could be further investigated with different display elements in synch with the wearer’s condition and context. Instead of completely disconnecting the wearer from distractors, synching her with external rhythms could provide another quality of Somaesthetic appreciation.
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. GS3—Graduated Spine Supporting System—holds up an injured spine and flexibly adjusts to its recovery status (Paderina, et al. 2017); prosthetics, beyond supplementing body parts, can augment human perception and bodily skills with new physical additions, as in the cases of Sonifica, prosthetic instrument for Viktoria Modesta to make soune performance with ther body (Goldemberg & Zalcberg, n.d.) and the robotic third thumb to see what it may be like to live with an unusual body part (Wilson, 2017) (Figure 4).

![Figure 3 Sensewear ©Corti and Parati (Rhodes, 2015)](image)

![Figure 4 Viktoria Modesta and Sonifica © Jason Perry (left) and The Robotic Third Thumb ©Dani Clode (right).](image)

3.2.4. **Performing through the body: improvising, practicing, or reflecting**

As implied above, body modification is not only about static, passive addition to the bodies, but also involves changes in bodily shapes and skills 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 minimal movement and distraction for inward focusing, the notion of soma-wearables
explores dynamic bodily experiences that involve alternative and conscious movements: e.g., Sway, a mindfulness app with a movement tracker, transfers the qualities of Tai-Chi to an interactive experience for mindful movement (Cheng, 2017), hipDisk, a set of two layered disks worn around the waist, generate sound according to the wearer’s movement (Wilde, n.d.), and Bubble Jumper, an augmented body suit, boosts the wearer’s strength and protects players when they crash into each other (Kim, 2017) (Figure 5).

We explored experiential qualities relevant to Somaesthetic appreciation through the lens of wearables—e.g., being attentive to one’s physical and mental condition through sensory prompts, being synched to one’s environment and other entities for harmonious presence, experimenting with unfamiliar body modifications or movements, exerting to practice valued body skills, discovering alternative versions of one’s body and mind, and ultimately expanding one’s perceptual and experiential horizon through body consciousness (Höök, 2010). These qualities, not only framing the soma-wearable design approach, can also define the status of somatic wellbeing. 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 observe how the approach is interpreted and further explored by the participants. The workshop consists of three parts: 1) body scanning and body mapping for individual ideation, 2) orientation of the soma-wearable design approach, and 3) group reflection and ideation. The students were asked to complete the first part individually before attending the workshop with an audio script for body scanning (about 10 minutes) and a body mapping template provided in advance. At the beginning of the workshop, the soma-wearable design approach was introduced in terms of its objectives and core qualities (about 1 hour). The orientation was offered after the individual reflections so that the concepts of soma-wearable design and examples would not influence the students’ body scanning and ideation. After the orientation, the students shared their thoughts about body scanning and body mapping, and continued another round of group ideation for soma-wearables by sketching or body storming (about 2 hours).

4.1. Body Scanning and Body Mapping

In this workshop, we explored creative potential of body scanning and mapping as ideation methods to engage the body in design and research process. Body scanning is a method for listening to one’s mind and body by shifting the focus inwards and following a guide script in an environment where distraction is eliminated. The method, often used for meditation, is also applied for conditioning one’s mind and body for creative practice and design ideation based on the notion of Somaesthetic practice (Lee, Lim, & Shusterman, 2014). The principles of body scanning include: 1) divide body

![Figure 5 Hip Disk ©Danielle Wilde (left) and Bubble Jumper ©Ryoichi Ando (right).](image-url)
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 (ref). The audio script guides individual participants to shift their focus inwards by closing their eyes, listen to their body by scanning through different parts from top to bottom, let sensations emerge and felt from each part, and use them as inspirations and narratives for design ideation. The body mapping is used as a means for articulating felt senses. The students listed three senses that lasted in their body and associate each to a corresponding body part by marking in the body outline (Figure 6).

We observed what kinds of felt senses the participants came up with after body scanning and how the participants associated each of them with different body parts and develop them to 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 throughout 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 patterns of changes in what are felt over time, but it is noticeable that even in a static body scanning session, individuals went through dynamic feelings in different parts of their body, reflecting different depths of their focusing and articulation. Many felt senses are associate 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 non-judgemental descriptors like colours or temperatures.

4.2. Ideation and Discussion in Group

After describing and sharing their felt senses, the participants ideated 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 the participants are trained fashion design students, paper sketching, Photoshop, and body storming methods were efficient for them to ideate and communicate initial concepts without involving as 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 reflects that many students focused on sensations related to stress, fatigue, pain, and headache after body scanning. Most ideas were about embedding static sensory prompts (mostly heat) to some parts of clothes (e.g., jackets with heating pads embedded around the shoulder, 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, they were able to compare and contrast different senses felt in different parts of their body. In this process, they identified which parts they feel more stressed, tired, or painful; and applied some direct interventions to corresponding body parts.

4.2.2. Conceptual Theme 2: Material Imagination for Body Support and Pain Relief

Supporting body posture or relieving pain was another conceptual theme. As briefly mentioned, many participants focus 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 layers that can simulate 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 wearable patterns and structures were explored to graphically divide and connect 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 distributing the pain from one part to relatively stable and relaxed parts. In addition, a lot was discussed regarding how to simulate corresponding material experience through wearables, for example, to make the wearer
feel like sinking in or synched to water environment, 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 was interpreted in different wearable forms, simply from oversize 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, connects them, and enables unusual, un-purposeful movements around the body, which are easily associated with fidgeting and stress release. Specific wearable concepts include a jumpsuit with fabric strip that connects 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 something to play with (e.g., jewellery, tassels).

4.3. Reflection
Due to the limited time of ideation and fashion design background of the participants, most ideas were discussed around the first and second themes that directly build upon their felt sense and respond to them as therapeutic interventions. Still it was interesting to observe how imaginations and narratives emerging from body scanning could drive material speculation for particular experiential qualities of wearables (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 responding to them with therapeutic interventions), how to make others experience similar sensations that they felt through clothing, and how clothing could enable new movement, reflection, and performance. Although the questions were not fully answered, the discussion revealed potential of the soma-wearable design as an approach that embraces 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 in our future work from end-user perspectives.

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 can positively influence self-perception and performance in close relation to clothing, we integrate fashion design perspectives into Somaesthetic appreciation to conceptualize the soma-wearable design, and specify desired qualities of soma-wearables and corresponding design dimensions by re-articulating selected wearable applications in the context of Somaesthetic reflection. The four qualities—1) transient space for reflection, 2) sensory prompt synched to context, 3) body modification for subject formation, and 4) performing 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 reflective space 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 with selected examples. We see this as a meaningful opportunity to further investigate, especially about the constructive loop between self-reflection and performance through body consciousness.
Although fashion design can bring useful perspectives to contextualize Somaesthetic practice with more intimate and direct 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 desired subject formation. In this vein, the conceptual qualities and design dimensions need to be further investigated in relation to 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 reflection and experiment.

We expect the soma-wearable design approach to envision a promising potential for bringing fashion perspectives in the design for wellbeing with its broader implications in current user-centered perspectives in human-computer interaction design. We plan to conduct more soma-wearable design workshops with diverse groups of participants to evaluate the design approach and explore more wearable forms based on the defined qualities. In addition, we will also conduct a longer study to investigate the constructive link between Somaesthetic reflection, self-perception and performance and its impact on wellbeing with specific application scenarios and prototypes developed (e.g., soma-wearable for mood change).

6. References