

# AESTHETIC EXPERIENCE AND COMFORT: 'GARMENT DESIGN INTEGRATED WITH MOVEMENT QUALITIES, DYNAMIC BODILY EXPRESSION, AND EMOTION'

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## ABSTRACT

This research investigates comfort factors of users' aesthetic experience, in particular emotional and aesthetic experiences that enhance wearability. The aim of the research is to develop concepts of movement-based interaction for inducing emotion, focusing on clothing as an interactive object. The more specific aim is to explore how to integrate movement qualities, bodily expression and emotion in garment design. The research utilizes the technique of scenarios to analyse the relationship between emotion and movement and garment. Garment has been developed for the participant as a prototype under the concept of shape change, 'Trans-For-Motion.' The results indicate that, when wearing clothing in the context of comfort, the participant used her clothing to wrap or hold her body for the purpose of "protecting," "hiding," and "disguising" in insecure situations (feelings associated with relief and security), and conversely, for "self-expression" in secure situations (feelings associated with pleasure and enjoyment). In addition, the participant seemed to have her own ideas and gained great enjoyment by manipulating the garment in an interactive way with her body. The sense of movement, which refers to trace or the positional history of human motion, is closely related to space.

**Key words:** *aesthetic experience, comfort, movement, clothing.*

## 1. INTRODUCTION

Comfort is not only based on the human sensory response to clothing materials, but is also determined by a variety of psychological, social, and emotional parameters. In a recent overview on the conceptualization of clothing comfort, Branson and Sweeney [1] stated that

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“clothing comfort is a satisfied state of mind indicating physical and social-psychological balance or harmony between a person and his or her environment.” However, they emphasized that “the crucial point of comfort judgments do not follow directly from the physiological and perceptual responses of the mind and body.” Some processing occurs in the mind such that in a given situation the interaction among stimuli elicits responses that are transformed into a comfort judgment. They applied Pontrelli’s [2] comfort judgment, a black-box phenomenon that is a filtering process which is influenced by such factors as past experiences, expectations, and remembrances to judge the subsequent comfort. This influence may be either at the conscious or unconscious level. In other words, comfort is an individual-dependent, experiential and situational specific-domain emotion.

On the other hand, in notions of aesthetic experience, Salem et al. [3] referred to Kansei experience in terms of aesthetic, emotions, and inner balance. They suggested “two or three distinctions of aesthetics experience: (1) the aesthetics of the perception (AoP), the degree to which all our senses are gratified; (2) the aesthetics of the cognition (AoC), the meaning we attach to the product; or (3) the aesthetics of the action (AoA), the way we feel comfortable, satisfied or pleasant though bodily action.” The notion of using the term of aesthetic *ex*-perience such as (AoP), (AoC), and (AoA) when interacting with products has involved focusing on aesthetic *co*-experience, which refers to the way an object can make people build their imagination, experience or creativity through mental and bodily activities. In other words, in relation to a product’s aesthetics and interaction, users are not interested in products, rather they are in search of challenging experiences. Therefore, the designer needs to create a context for experience to evoke emotion, rather than just a product. Hummels [4] states that “creating a context for experience refers to a design that offers the user the freedom for building his or her own experience.” In this sense, although users may not find it easy to use a product for manipulating the context of an experience, they have the feeling of enjoyment of the experience due to its challenging, seductive, playful, surprising, memorial or rewarding aspects.

“Clothing is one of the most intimate things that we interact with in our daily lives. Because of its extremely close relationship to our body, our clothing is able to invoke some of our most intimate interactions; it is able to record our fear and excitement, our stress and our strain, through the collection of sweat, skin cells, stains, and tears. It becomes worn over time and carries the evidence of our identity and our history” [5]. This perception of clothing suggests that design elements of aesthetic experience and comfort require the understanding of our minds and bodies, and also bodily action processes. Designers need to examine users’ expressive characteristics and the personal experience or symbolic significance of particular objects or body movements in order to design clothing. In addition, they need to create a context of experience in which objects can evoke emotion. Consequently, to enhance the aesthetic experience of clothing comfort through design, comfort may be affected by a combination of factors: how a garment feels against the skin, how it appears to the eye, how it interacts with body movement, how it is remembered, and how it can be manipulated by the wearer to create different volumes in space. It is critical to identify and evaluate kinaesthetic knowledge about the relationship of design elements (i.e. body senses, body behavior, meaning, movement) with *comfortableness* in clothing in order to develop new design principles.

## 2. AIMS AND RESEARCH QUESTIONS

This research focuses on movement-based interaction for inducing emotion, with clothing treated as an interactive object. The aims of this research are to explore and understand: (1) the integration between movement qualities, dynamic bodily expression, and emotion in garment design; (2) the way people perceive the function of clothing in relation to their spatial interactions; and (3) the interplay between object manipulation and movement. The research addresses the following specific questions:

- How is the concept of ‘movement’ a part of an object’s emotional interaction?
- How do people hold and wrap their bodies in relation to their interaction with an object?
- How do people perceive the function of clothing in relation to their spatial interactions?
- Can the phenomenon of movement quality – as the relationship between the body, space, and movement – be applied to enhancing the comfort of clothing?

### **3. METHODOLOGY**

#### **3.1. Scenario approach**

In the context of emotion in relationship with movement, most studies on posed expressions of emotion have incurred a number of problems, such as use of semantics and language limitations. “Often encoders (participants) are just given emotion labels to describe the emotional state they are to encode (e.g. ‘Read this text as if you were very ‘afraid’).” The problem is that different encoders may attribute different meanings to such labels and that they might envisage different situations inducing these emotions. Such problems can be partly avoided by using a scenario approach [6].

Considering the practice-led-research in a critical artefact methodology, Bowen [7] suggests that using the technique of scenario enables users to engage with their own values, ideologies, and personal values. This research utilizes the technique of scenarios not only to use information for a participant to guide action so that obstacles (simple semantic words) are avoided, but also to enable the participant to interact with clothing involving her personal preferences and values. Two scenario approaches to encode comfort were used:

- (1) When a threatening person approached you in a public space.
- (2) When meeting with close friends in a public space.

In this approach, the participation was provided with those scenarios to elicit emotion, and the participant was instructed to imagine these situations and act as if she was in such a situation.

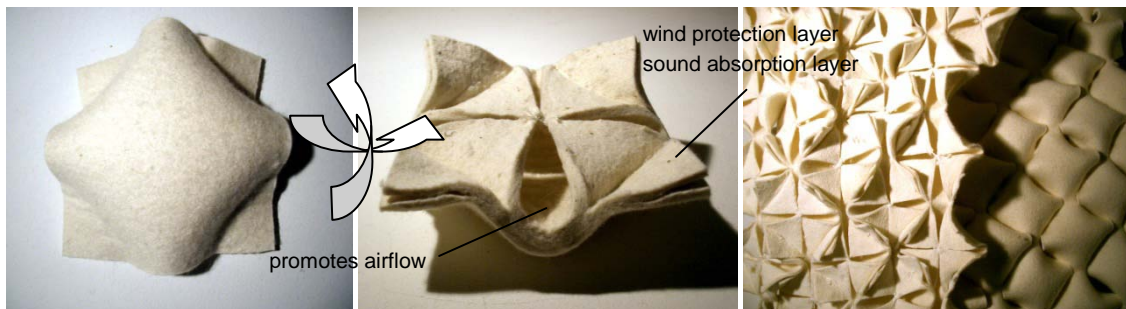
#### **3.2. Participation**

This paper focused on one participant, a woman, as a case study. The participant is in her mid 30s and is a wedding planner. She is interested in eccentricity of style, clothing, and ideas. The reason for choosing the woman to observe her wearing garment’s behaviour is that women tend to select daily clothes based on clothing function in relation to emotional and social activity, whereas for males it is weather conditions [8]. The participant encoded each sentence for an hour within each scenario. The photographic images are based on the elicitation of her behavior were recorded by a digital camera. The data was analyzed using observation based on the above research aims and questions.

### 3.3. Stimuli materials-Design prototypes (I)

One of the motivating forces for the development of fashion has been to seek a continually evolving concept of beauty through the transformation of the body's natural form [9]. The concept of transformation adapts body movements to users' emotional requirements, such as the transformation of furniture into dresses and Möbius strips forming infinite possibilities [10]. The current practices and studies of emotion-based clothing practice have involved integrating display technologies into garments to allow interactivity and visual output to occur on the body. The focus has often been on reactive or interactive clothing that illuminates or changes form according to the wearer's activities [5].

In this study, the conceptual design prototype for manipulating garments has been developed for the participants to wear and her responses will be recorded. This is a development of the concept 'shape change,' described as 'Trans-For-M-otion.' I used the conceptual design proposal to develop the prototype. Gaver & Marin [11] suggest the term conceptual design proposals "might also form the basis for new kinds of user studies [...] concept proposals could introduce speculative new ideas to potential users in such a way as to evoke general insights into their attitudes as well as more specific reactions." This concept is proposed as a tool to enhance and explore self-expression and self therapy. The prototype garment can be designed to allow wearers to change the form via scenarios, which interacts with movement and space. The prototype form created is un-instructional and uncompleted. The form needs the wearers' body interaction, through the manipulating process, to build their ideas or experience, and to give full comfort and enjoyment.



**Figure 1:** Garment's unit structure: left image is called inside form, middle is outside form when it turns inside form over, and right image is when unit is fabricated. 'Transe-For-M-otion' is able to stimulate a myriad of responses. For example, the shape changeable 3D form may support the neck, or back with the trapped air unit structure. This creates a garment that feels like a cushion.

It helps people protect their body from hazardous environments.

Designed and photographed by author.

In the design prototype, the main structure is based on the idea of deconstruction and reconstruction structured by a unit component. This unit component gives potential to its form and the transformation of form. It also enables the blurring of boundaries between clothing and other forms of object. The unit's modular segments are made out of wool felt. Felt is a non-woven cloth that is produced by matting, condensing and pressing fibres. It resists flames and chemicals (e.g. dirt air and water filtration). It absorbs sound (e.g. acoustic performance) and insulates against heat and cold. More information about the process design prototype is reported in a previous article [12].

The second prototype for investigating the bodily aspects of human-to-object interaction is 'Trans-For-M-otion' (II): 'disguise body like a ghost with the garment.' This garment is based on the same structure as first prototype, but it is combined with attachable or detachable electric-light bulbs, which are fixed inside the pockets. The aim is to carry out research on the question: how do feelings of fear or threat in insecure situations turn into comfortable, enjoyable, and playful emotions?

## 4. DISCUSSION AND RESULTS

### 4.1. Emotion and movement into wearing clothing activities (I)

This section describes how movement and emotion are integrated, and how they are communicated by focusing on clothing as an interactive object through two scenario approaches. The human body is designed for movement. Movement is a part of the expression of emotion, and not a simple reaction. Emotion emerges as potential movement implies a particular bodily orientation to the world [13].



**Figure 2:** The way the garment is worn in an insecure situation.



**Figure 3:** The way the garment is worn in a pleasant situation.

I investigated emotional movements in the activity of wearing clothes in order to understand how people hold and wrap their bodies in the context of emotion. Two sets of scenario informed the participant's actions in this case study. As shown in the picture (Figure 2), the participant tried to close down her body with the garment towards the centre of her body when she imagined a threatening person approaching her. The emotion created can be associated with fear or threat. She tried to cover her body - in particular, her head, neck, and shoulder area is covered by the garment. Her upper body (head and torso) slowly bends towards the ground, and her gaze also faces the ground along with crossed arms. It appears that she wanted to escape the person's notice. The space created by the inside zone of clothes can be referred to as the personal space, for this feels like a place to emotionally hold and protect. In other words, the way the garment is worn indicates that the body's features were important emotional cues, such as the position of the trunk, head, arms, and degree of openness and closeness. The participant mentioned that just imagining a fearful situation also evoked some sweating, muscle tension, and an increased heart beat.

Conversely, Figure 3 shows how she manipulated the same garment on the body when she imagined herself meeting close friends. The wrapping of her body and associated movement showed a more open and self-expressed reaction. In this sense, evoked emotion can be associated with a sensation of warm, relaxed emotions of happiness and enjoyment. Revealing the head, neck and shoulder area, when manipulating this garment, seemed to be an important aspect of being comfortable and as self-expression. Free arm movement also showed how limbs, like arms, can be used to express emotion. In addition, closing and opening arms and associated movements may create space in terms of personal and general space. For example, moving the arms creates a border for personal space against outer space. The whole space surrounding the outside of the clothes can be referred to as general space. Accordingly, body movement and its behaviour in relationship to clothing showed the bodily and emotional significance of people's expressive characteristics. This research is based on further investigation from a previous article [12].

Consequently, the results show that in insecure situations when a garment creates feelings associated with comfort, this is composed of relief and security. Conversely, in secure situations when a garment creates feeling associated with comfort, this is composed of pleasure and enjoyment. In addition, the results indicate that certain bodily postures and movement (e.g. head postures like head-up, down, tilted, head sinks between shoulder, and arms movement) determine judgments of emotions to some degree of emotion. In addition, that imagination led to a psycho-physiological response. For example, just imagining a fearful situation evoked some sweating, muscle tension, and increased heart rate. It is assumed that there are mutual relationships between imagery (perception) and physical action systems. That is, given that the information is encoded in terms of imagining the above two scenarios, this necessarily constrains the operation of simultaneous and successive actions.

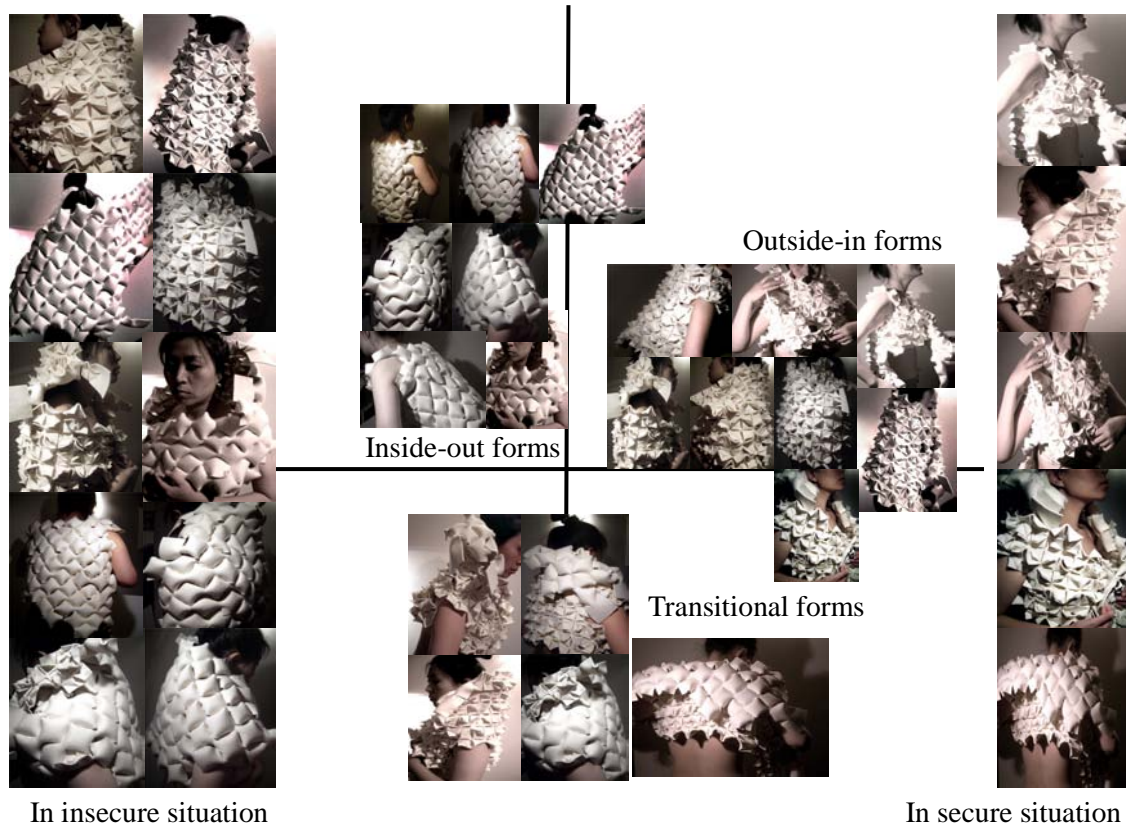
#### **4.2. Freedom for building her own experience into wearing clothing activities (II)**

In this section, I describe how body actions occur in the context of bodily experience. Experience, perception and memory, is not derived only from the mind (brain), but also from bodily interactions with objects involved in the environment and spatial situations. In the relationship between the brain and human experience, Alva noë [14] explains “how the brain plays a role in supporting human experience ... when we explore the world in perception we're engaged in a temporarily extended activity—we move our eyes, we move our heads, we move our bodies, we move around—and all of our movements produce further sensory changes.” He also explains the phenomenon of neuroplasticity, which is the brain's ability to change itself in response to novelty. For example, if you take on some new activity, the brain actually and actively reorganizes itself.

The central research focus in this study is the importance of looking at experience in the context of kinaesthetic comfort interaction with the garment. The design concept being explored is called ‘emotionally expressive action with the garment’. The aim was to identify how the participant manipulates the garment in relation to emotions and bodily activity in two scenarios, as follows:

- (1) When a threatening person approaches in a public space.
- (2) When meeting with close friends in a public space.

The participant started manipulating the garment given the stimuli-design prototype, ‘Trans-For-M-otion’ (I). The time taken for her manipulation of the garment was about an hour for each scenario. Figure 4 shows that she built her own garment for her body, with twenty forms composed of seven inside-out forms, eight outside-in forms, and five transitional forms. Ten out of the twenty garment forms interacting with her body were based on the first scenario when a threatening person approaches in a public space. Only Five garment forms interacting with her body were created when she was asked to imagine meeting with close friends in a public space.



**Figure 4:** Garment forms and body interactions as a response to secure and insecure situations. Designed and photographed by author.

Consequently, it is assumed that the participant was more aware of garment forms when she imagined herself being in an insecure situation. In addition, the results show that the participant had her own ideas and was full of joy when manipulating the garment in an interactive way with her body. Through the garment manipulating process, she found a way of creating comfort for her body in each scenario. The prototype garment, described as ‘Trans-For-M-otion’ (I), is a useful tool to enhance and explore self-expression. The idea can help her to accommodate the form for her needs – for body movements and for adapting space. In other words, for the individual, this could be used as a form of self-therapy and as an aid in self-awareness. ‘Trans-For-M-otion’ can be used expressively by highlighting an emotional state so that behaviour can be adapted accordingly.

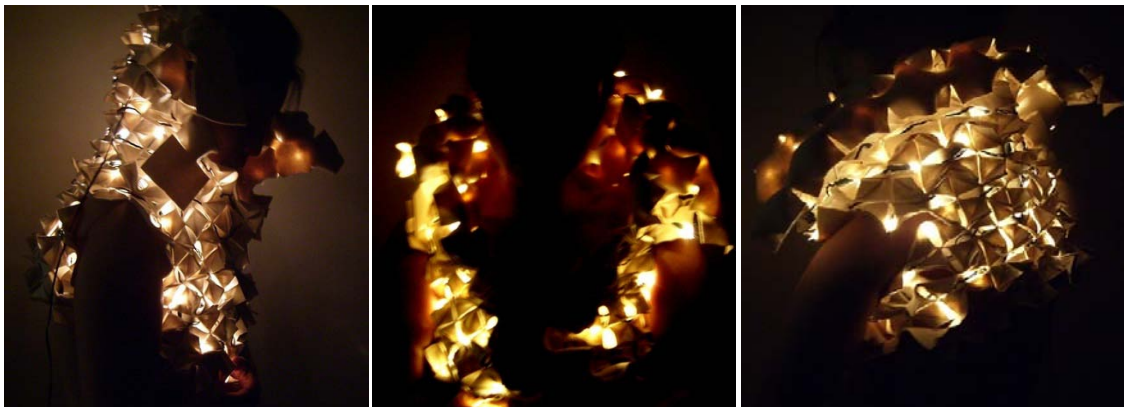
### 4.3. Emotion and movement into wearing clothing activities (III)

This part focuses on how action and space are integrated, and how they are communicated using the body as an interactive object. The body is considered as a tool for human intentions. Our physical body plays a central role in shaping human experience in the world, understanding of

the world and interactions in the world. This aspect of aesthetics is related to the perceived quality of performed movements. The sense of movement is closely related to space [13].

As a response to the participant being more aware of garment forms when she imagined herself being in fearful and insecure situation, another design concept was developed: ‘disguise body like a ghost with the garment.’ The aim is to examine how feelings of fear or threat in insecure situations turn into comfortable, enjoyable, and playful emotions? People, in particular women, sometimes imagine disappearing, ghost-like, in order to protect or hide themselves from threatening persons approaching them in insecure situations. If the body disappears when wearing a garment in that situation, a feeling of comfort may be achieved. The dictionary definition of comfort is this: “when you feel better after feeling sad or worried, or threatened, or something that makes you feel better” [15]. The absence of the body enabled by wearing a garment in the real, three dimensional world is a form of abstraction or fiction.

The prototype garment used in this experimentation, ‘Trans-For-M-otion’ (II), is based on the same unit structure as the first prototype, but it is combined with attachable or detachable electric-light bulbs, which are fixed inside the pockets. The purpose of combining the garment, with technology is to explore the kinetic behaviour of a garment in its moving form and its trace of being moved in space when the performance (body movement) interacts with the garment.

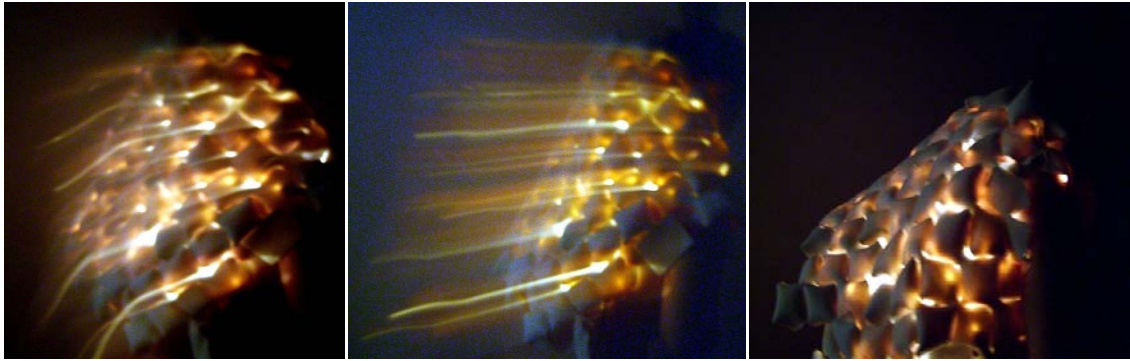


**Figure 5:** The use of the garment is for protecting the body, reclaiming private space, and creating self mood therapy. Designed and photographed by author.

Figure 5 shows that the garment can be described as a form of kinetic object and as a form of visual expression through the way that garment changes shape. The role of the body, which is worn by the garment in this sense, is as a tool in an opaque form. It is a form of emotional disguise, ghost-like. The garment functions as a mask in order to hide and protect the body from hazardous environments. For example, the participant’s intention was to use the garment to prevent being grasped by a threatening person approaching her when the lights are on. As she wears it, the garment seems to be used to reclaim her private space and as self-mood therapy. When interacting with the body, the prototype garment creates continuous forms. Form is also determined by the shape and size of the wearer.

Figure 6 shows the garment as a form of kinesthetic behaviour, based on encountering narrative structures of bodily absence. The garment form in this instance is mounted with light bulbs in the pockets, which can track the choreography of body movements.





**Figure 6:** Garment in a segmentation process of movement that translates as the trace or positional history of human motion in response to experiences in insecure situations. Designed and photographed by author.

Garments can be effectively used to hide, reveal, and distort the self when the wearer is in an insecure situation. It also shows how the garment can be described in a segmentational process of action through the positional history of human motion. Garment interaction with an opaque or invisible body shows the boundary in-between personal and general space. These experiments indicate the garment enables the reclaiming of private space in order to protect the wearer from insecure situations. Bodily movement through space is crucial as it provides people with a particular way of acting in a particular situation. Bodily placement and orientation ensure that our understanding of space is always situated and contextual.

## 5. CONCLUSION

This paper commenced by presenting the way body movements and emotions are integrated, and the way they are communicated by focusing on clothing as an interactive objects within two scenarios. The results showed that, when wearing clothing in the context of comfort, the participant used her clothing to wrap or hold her body for the purpose of “protecting,” “hiding,” and “disguising” herself in insecure situations (feelings associated with relief and security), and conversely, for “self-expression” in secure situations (feelings associated with pleasure and enjoyment). Additionally, the way the garment is worn indicates not only the body’s features were important emotional cues, but also that, in imagining threatening situations, this led to psycho-physiological responses. Based on this investigation, it was apparent that the participant seemed to have her own ideas and enjoyed the experience. In fact, the participant was more aware of garment forms when she imagined an insecure situation than a secure situation. The final study focused on a fictional scenario under the idea of ‘disguising the body like a ghost with the garment’ in an insecure situation. The garment combined with electronic lighting enabled the wearer to find out how feelings of fear or threat in insecure situations can be transformed into comfortable, enjoyable and playful emotions, such as an opaque body for protecting, hiding, and reclaiming private space and for tracking the positional history of the participant’s movement in space.

This study emphasizes the relationship of emotion and movement for clothing. It has also been important to consider how people perceive the senses against body and space. For future studies, further investigation into the qualities of movement will extend the research into the emotional aspects of the form and function of clothing combined with technology (i.e. motion capture).

The clothing can be also potentially combined with electronic (i.e. light emitting diodes - LEDs), or woven optical fibers. This research has highlighted the potential of design practice as a trans-disciplinary design approach in terms of the interrelatedness of design elements between creativity, space and clothing in relation to human behaviour and spatial cognition. The research will provide insights into important issues relating to the concept of aesthetic comfort.

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