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AMBIVALENCES



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# NEW/OLD ADVANCES

# Analysis of *Emotional Experience* related to *Sensory Perception* of Woven Textiles based in the UK

**Gina Nadal Fernandez**

Manchester Metropolitan University

## **Keywords**

Emotional Experience, Sensory Perception, Woven Textiles, Tactile Sense, Visual Sense.

## **Abstract**

This paper examines how sensory perception can elicit emotional experience to textiles. The Repertory Grid Technique, a qualitative tool, is used to analyse the bi-polar constructs generated by the participants at the time to evaluate the sensory perception of twelve woven textiles.

The first section examines and discusses current debates on emotional experience through artefacts, highlighting differences in the terminology used and points of agreement; notably that emotional experience refers to the intangible meanings, associations and connections that an individual transfers onto their object during their relationship. Emotional experience implies that the object has an emotional significance and becomes a vessel for past events and experiences. The second part looks at the evidence generated during the practice-based investigation of this research.

A three-domain framework – sensory, cognitive and emotional domains – was created based on the literature review to categorise the bi-polar constructs provided by the participants. The data shows that tactile sense has a higher rate of eliciting emotional experience when evaluating woven textiles.

## 1. Introduction

The exploration of the intimate proximity of clothes to the body and the self has been studied for more than two decades (Fleetwood-Smith et al., 2019). Among material culture literature, Sophie Woodward's (2007) study looks at the wardrobe of British women, pointing out that clothes constitute the *self* of a woman. She asserts that the wardrobe can be seen as what a woman *is*, while the outfit accentuates the attributes and capabilities of the woman. Under the umbrella of fashion sustainability, Niinimäki and Koskinen (2011), have explored the intangible connection that people place on their clothing to examine longevity of ownership. In design, Chapman (2009) develops the Emotionally Durable Design framework, in which the design durability paradigm has implications beyond the sole longevity of an object's physical endurance. However, there is little research exploring the specific relationship between woven textiles and individuals. Within woven textiles Seo (2015) presents aspects of emotional durability in textile design.

The paper examines and discusses current debates on emotional experience through textiles, highlighting differences in the terminology used and points of agreement. Subsequently the theory extracted from the discussion is reflected on the data gathered using a qualitative methodology.

The paper structure is as follows: after comparing different frameworks of emotional experience through textiles, it presents the method and methodology of the research followed by the participant's profile. The data gathered is then compared and contrasted with the current literature of emotional experience, and finally the conclusions and contribution to knowledge are presented.

## 2. Review of Literature

This paper presents the contextual review of two studies that have explored and understood emotional aspects of textiles from different perspectives, and the framework of this research.

### 2.1. Applied Textiles

In her doctoral thesis *Emotional Value of Applied Textiles - Dialogue-oriented and participatory approaches to textile design* (2010), the design researcher Anne Louise Bang examines the emotional value of applied textiles. Bang (2010) looks at the work of Norman (2004) and Jordan (2002), with the addition of Desmet's (2002; 2008) research to approach emotional value within product design.

Bang (2010) first presents the work of Donal Norman (2004), a cognitive, computer and UX researcher. Norman (2004) distinguishes three aspects of design that relate to the three levels of human cognitive and emotional system of processing information, acknowledging the oversimplification of Norman's theory. He states that at the *Visceral level* individuals have a universal reaction; they perform in the same automatic manner when feeling pleasure or fear, yet the *Behavioural* and *Reflective levels* are sensitive to experiences, training, education and person's background. The *Behavioural level* controls the everyday behaviour and actions of the individual, how the person reacts in stressful situations or in enjoyable moments. The contemplative part of the brain is linked to the *Reflective level*.

Relating these three levels to the design field, *Visceral design* is concerned with the appearance of the object. This design is related to nature because humans coexist in the environ-



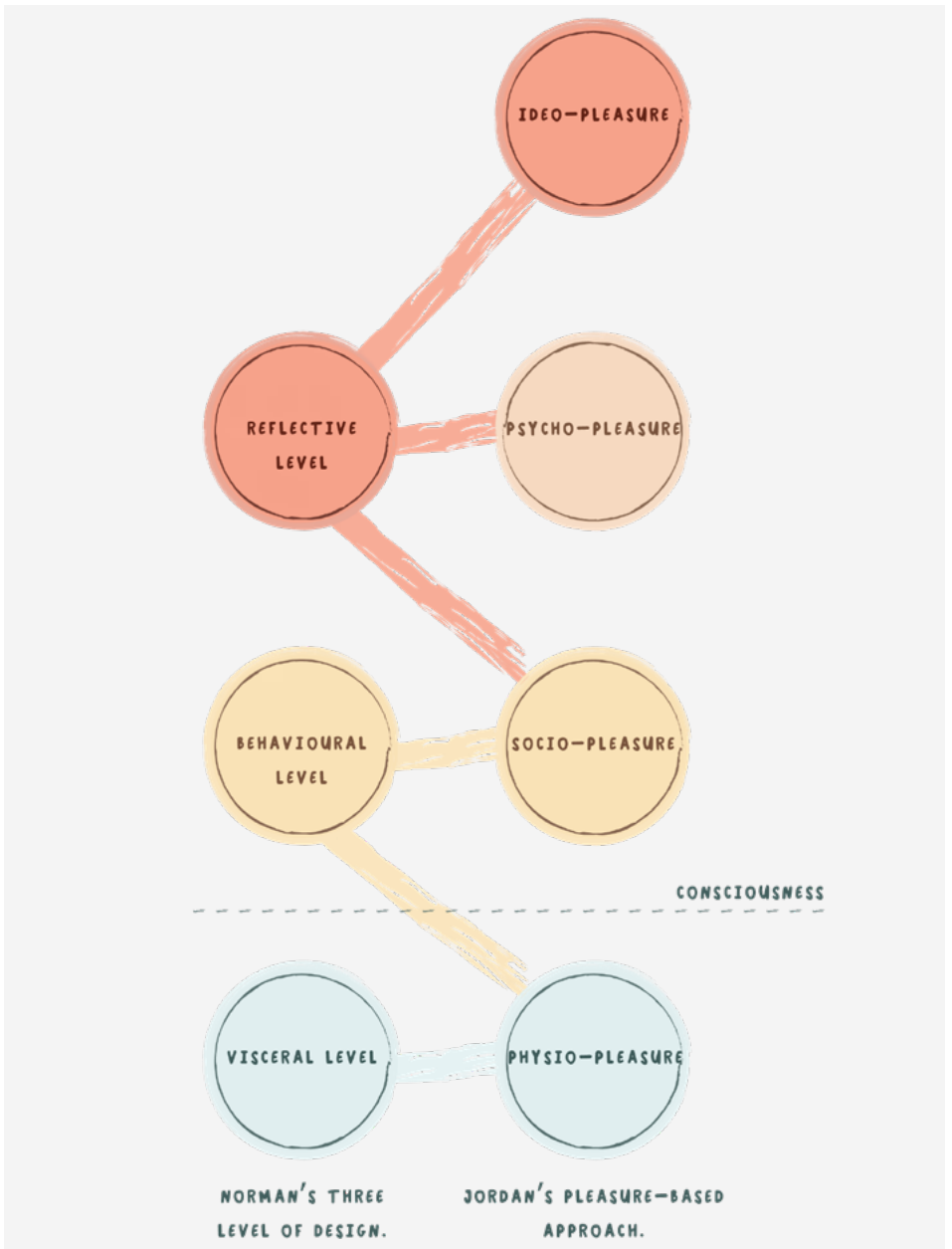
ment with other humans, animals, plants and so on. As a consequence of this coexisting nature, individuals are open to receive powerful emotional signals from the environment that are transmitted automatically at a *Visceral level*. The basic principles of *Visceral design* consist of designing across people, engaging the senses such as touch, smell and sound the dominant aspects. *Behavioural design* is related to pleasure and effectiveness of use. *Behavioural design* is all about performance, where appearance and rationale are not important. The four components of good *Behavioural design* that matter are function, understandability, usability and physical sensation. While *Visceral* and *Behavioural design* relates to appearance and use, *Reflective design* covers a huge territory. It considers the intellectualisation of the object, one's self and one's memories. For one individual, it could be about the meaning and the personal remembrance an object evokes; for another, it is about the projection of their self-image and the message an object sends to society. Bang (2010) notes that Norman does not go in deeply enough to develop the idea of *Behavioural design*. His amplitude definition does not help to give a clear understanding on this level, and some aspects might be better seen as part of *Visceral* or *Reflective design*. There appears to be a lack of information regarding social aspects when using Norman's framework to address aspects within emotional product design.

Bang (2010) points out the association that Norman (2004) does when comparing his three levels of design framework with Jordan's (2002) notion of a pleasure-based approach to human factors. Jordan, a marketing, design and brand strategy consult-

ant, defines pleasure with products as “the emotional, hedonic and practical benefits associated with products” (Jordan, 2002, p. 11); understanding emotional benefits as those belonging to how products affect a person’s mood. “The hedonic benefits are those belonging to the sensory and aesthetic pleasures associated with products” (Jordan, 2002, p. 11). Pleasure with products builds up from the relationship between the individual and the object. Jordan’s pleasure framework is based on the work of Tiger (1992), an anthropologist, who identified the four pleasures of the human condition.

Jordan (2002) distinguishes the following categories: *Physio-pleasure*, *Socio-pleasure*, *Psycho-pleasure* and *Ideo-pleasure*. The *Physio-pleasure* is concerned with the physical body from anthropometrics and ergonomics to the sensory perception’s positive feedback of the object. *Socio-pleasure* is drawn from aspects of the object that represents social status and helps to construct a personal identity that allows to enter a desirable social group. *Psycho-pleasure* refers to the individual’s cognitive interaction with an object and their subsequent emotional reaction. *Ideo-pleasure* relates to individual’s values such as political and religious.

For Norman (2004), *Physio-pleasure* combines aspects of *Visceral design* with some from *Behavioural design*. *Socio-pleasure* derives from interaction with others, therefore it combines elements of both *Behavioural* and *Reflective designs*. The pleasure that acts upon peoples’ reactions and psychological state during the use of a product is *Psycho-pleasure*, which resides at a *Behavioural level*.



**Figure 1.** Gina Nadal, interpretation of the connections of Jordan's (2002) pleasure-based approach and Norman's (2004) three level of design, 2021.

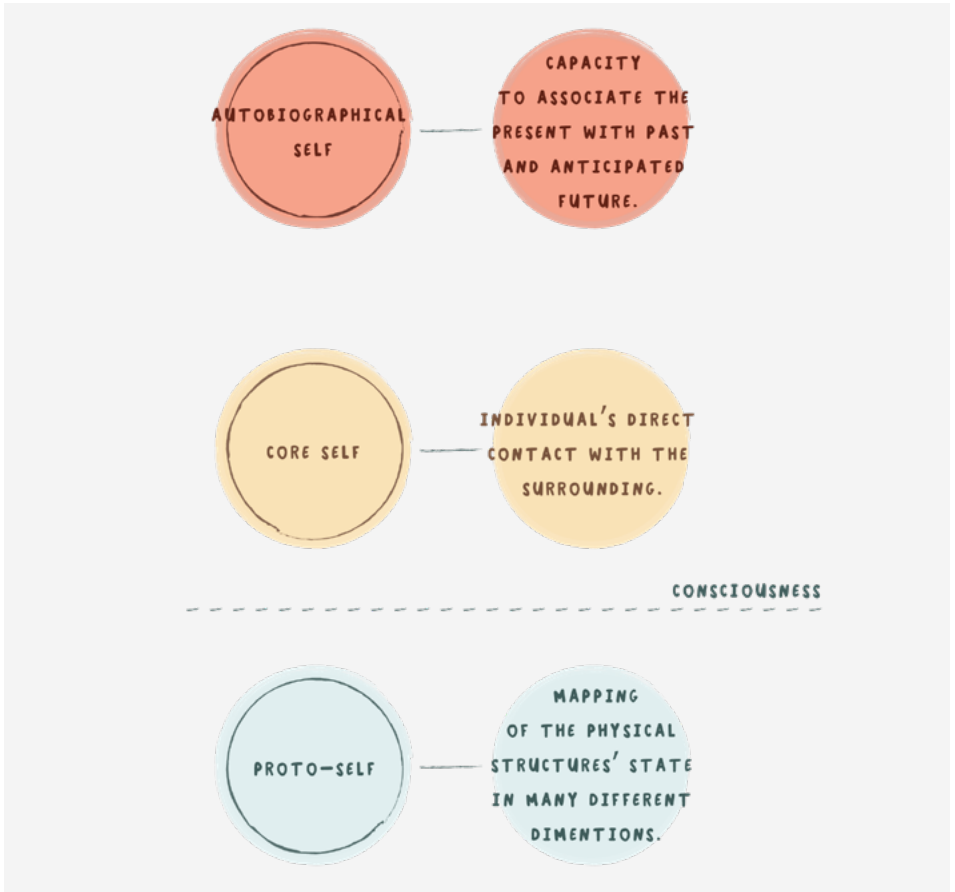
Finally, *Ideo-pleasure*, where the value of objects come from and the statement they make, clearly lies within *Reflective design* (Fig. 1). Bang (2010) uses the four categories of pleasure framework to invite participants to explore the personal experiences about the expectations to applied textiles.

Later she points out that emotional value is the emotion causation as a result of body feedback with the combination of cognitive aspects. She argues that four categories of pleasure (Jordan, 2002) can function as a common platform for establishing, substantiating and exploring emotional value of applied textiles. According to Bang, this concept is in agreement with Damasio (2000) and Prinz (2004), when they understand that an emotion that is felt – emotional experience – is literally the emotion. They add to this by saying that pleasure is strongly connected to the emotional experience, although it is not “an emotion” per se.

## 2.2. Textile Aesthetics

*The Language of Textiles: Description and Judgement of Textile Pattern Composition* by Siri Homlong (2006), an artisan and textile design teacher, investigates emotional aspects of textiles. The purpose of her research is to focus on personal aesthetic experiences and aesthetic judgements of textile pattern composition in the surrounding environment. She states that the notion of aesthetic qualities in her research is based on patterns of colours and shapes due to the fact her research only analyses the visual sense through verbal communication of the participants.

According to Homlong (2006), an individual’s visual perception and aesthetic appreciations are affected by emotions.



**Figure 2.** Gina Nadal, interpretation of Damasio's (2000) three types of the self related to the types of consciousness, 2021.

She refers to the types of consciousness and the relation to the three types of the self that Damasio (2000) builds in his book *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, to relate emotions to the surrounding environment. Damasio presents three levels of the self: *Proto self*, *Core self* and *Autobiographical self* (Fig. 2). Homlong (2006) only uses the conscious level, *Core self* and *Autobiographical*

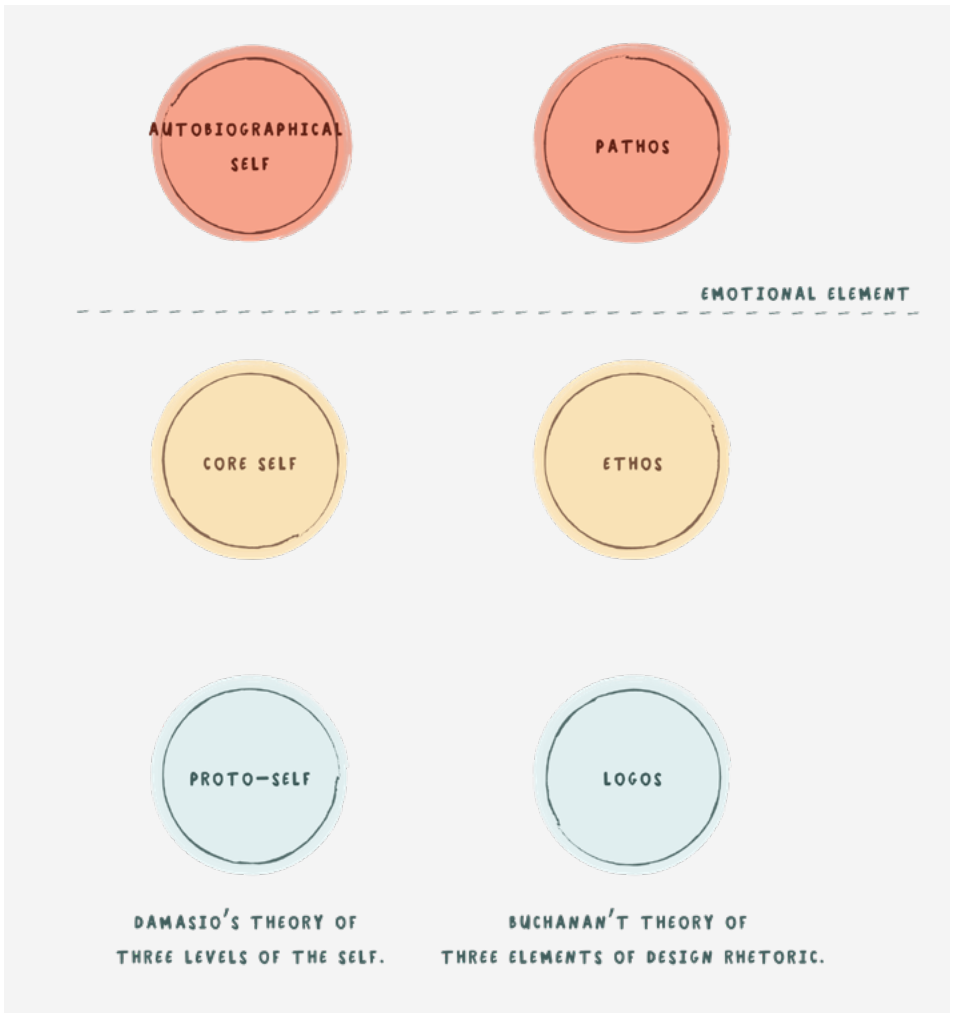
*self*, to develop her research. She postulates that through the *Autobiographical self*, the individual gains their own subjective experience and judgement of the surrounding environment. Remarking that each individual appraises the same object or situation in a different way because of their own subjective experience.

Damasio's (2000) theory of the three types of self is closely related to Norman's three levels of design, where both authors recognise an unconscious level and a top-level sensitivity to experience.

While Bang (2010) connects emotion value of applied textiles to Norman's (2004) and Jordan's (2002) work, Homlong links Buchanan's (1985) and Desmet's (2002)<sup>1</sup> work to individual's visual perception and aesthetic appreciations. According to Homlong, Buchanan divides design rhetoric into three elements: *Logos*, *Ethos* and *Pathos*. The first element, *Logos*, is the technological reasoning, in which the design practitioner manipulates the processes and material to technically solve a problem. The second element is character or *Ethos*. Buchanan refers to this element as the representation of the design practitioner in the object, not essentially as they are but rather who they wish to be. The third element referred to argument, emotion or *Pathos*. Buchanan says that *Pathos* connects the physical object to the mind creating fulfilling experience for the user.

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1 Desmet's computer programme, PrEmo, to guide designers in controlling emotional responses to their design based on nine basic emotion into five groups.



**Figure 3.** Gina Nadal, comparison of Damasio's (2000) and Buchanan's (1989) theories, 2021.

Damasio's (2000) theory of three types of self and Buchanan's (1985) theory of three elements present three levels, where the bottom one is the essential, the middle one is the subjective and the top level presents an emotional element or experience (Fig. 3).

In perspective of Desmet's (2002) model, Homlong (2006) points out that most of the emotions in his PrEmo were expressed when participants were visually judging the printed textiles. She suggests using Desmet's PrEmo to categorise emotions and mapping emotional concepts to obtain a general view at the end of the study. As Bang (2010) posits, this study argues that Desmet's groups of emotions is insufficiently elaborated on to function as a structural approach to *Emotional Experience*.

### 2.3. Textiles & Emotional Experience

In this study the term *Emotional Experience* refers to the intangible meanings, associations and connections that an individual evokes on their object during their relationship. *Emotional Experience* implies that the object has an emotional significance and becomes a vessel for past events and experiences that in turn can trigger *Emotional Experience* itself. The paper *Consumer-Product Attachment: Measurement and Design Implications* by Schifferstein & Pelegrim (2008) presents connections between consumer-product attachment and frameworks originated in design literature. They examine and define the construct of consumer-product attachment as:

the strength of the emotional bond a consumer experiences with a durable product. Consumer-product attachment implies the existence of an emotional tie between a person and an object. An object to which a person is attached is considered to be special and typically means a lot to that person. (Schifferstein & Pelegrim, 2008, p. 1)



Schifferstein & Pelgrim (2008) analysed Greenwald's (1988) four-facets of person's self-schema. According to them, if an individual experience elicits an attachment to objects because they help to reassure their self and enhance individual's feelings, then the four facets of a person's self-schema can help to indicate the variables that influence the degree of attachment between an object and a person. The four facets presented by Greenwald are *Diffuse self*, *Private self*, *Public self* and *Collective self*.

Schifferstein & Pelgrim (2008) connected Greenwald's (1988) four faces of a person's self-schema to the study of Norman (2004) and Jordan (2002) to further elaborate consumer-product attachment concept.

This study further compares the Greenwald's, Norman's and Jordan's frameworks with Desmet & Hekkert's three level of product experience. Desmet & Hekkert (2007) refer to product experience as the whole set of affects aroused by the interaction between a person and an object, "including the degree to which all our senses are gratified (*Aesthetic experience*), the meanings we attach to the product (*Experience of meaning*) and the feelings and emotions that are elicited (*Emotional experience*)" (Desmet & Hekkert, 2007, p. 59). These three levels have their own processes, the *Aesthetic experience level* can delight one or more of a person's sensory modalities, for example, sound and smell. They point out that this level has a specific focus on the tactile and kinaesthetic, rather than on the visual aesthetics. At the *Experience meaning level* cognition plays an important role, assessing personal and symbolic significance of the object. The cognitive process in this level

is subjective to the individual's background. Finally, *Emotional experience level* refers to those that evoke an emotional reaction, those affective phenomena typically considered in emotion psychology.

It is important to note that these four frameworks are correlated and have some agreements and discrepancies. In all four frameworks, the first and more basic level involves direct sensory gratification, where the top level involves higher level of cognitive elaboration linked to an emotional experience. According to Schifferstein & Pelegrim (2008), in the intermediate level socio-pleasure can be associated to the reflective design process. On the contrary, this research argues that socio-pleasure is not only associated to the reflective level but also to behavioural level as Norman (2004) mentions. Drawing on Desmet & Hekkert (2007), they point out that at the experience meaning level objects can play a class status, hence here exists a direct correlation to socio-pleasure and the public self.

The main discrepancies between frameworks seem to occur at the remaining levels. Norman's broad definition of *Behavioural* and *Reflective levels* created difficulties at the time to associate them to other frameworks. While *Behavioural design* is related to pleasure and effectiveness of use, *Psycho-pleasure* drives from products' cognitive demands. Although these are as partly overlap, *Psycho-pleasure* may involve complex cognitive elaboration that may not be part of *Behavioural design*.

Fig. 4 shows how Desmet & Hekkert's framework can be associated to Greendwald's, Norman's and Jordan's frameworks.

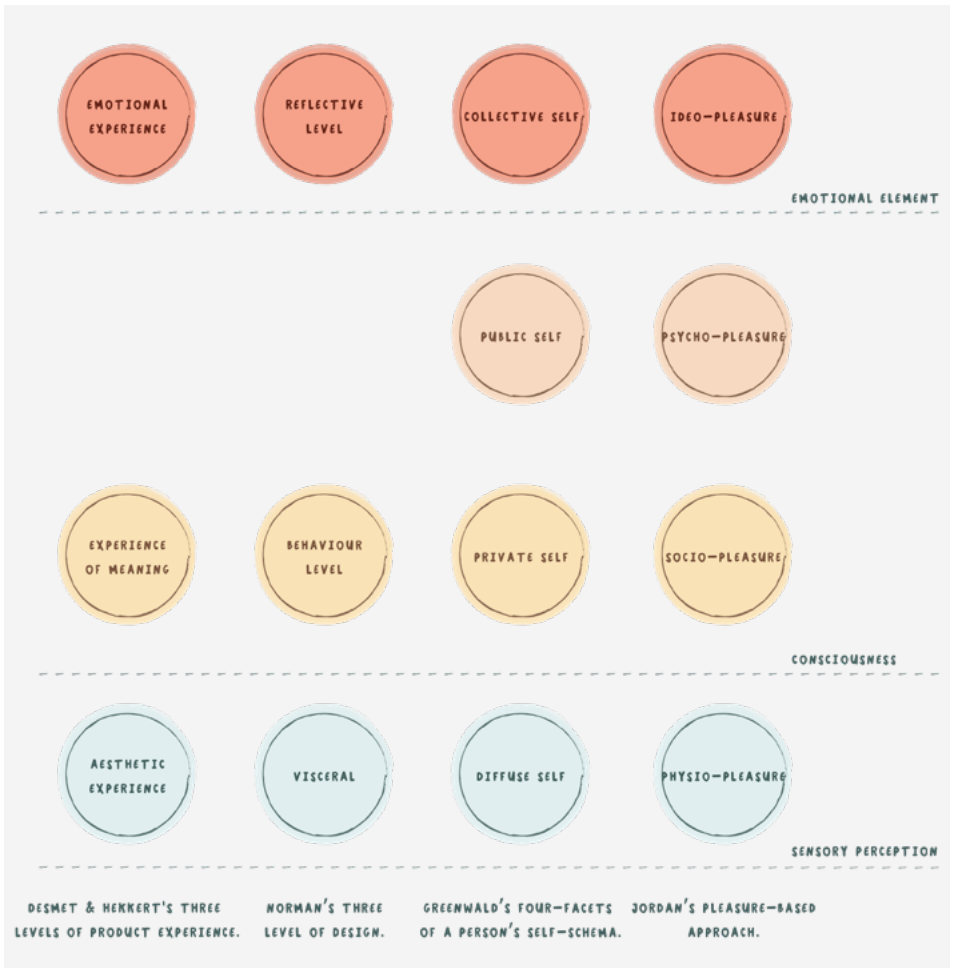


Figure 4. Gina Nadal, connection of the four frameworks, 2021.

These emotional design frameworks share a communality of three main domains: a sensory domain, a cognitive domain and an emotional domain.

Based on the previous frameworks analysed during the literature review, this study elaborates three-domain framework for *Emotional Experience* (Fig. 5).

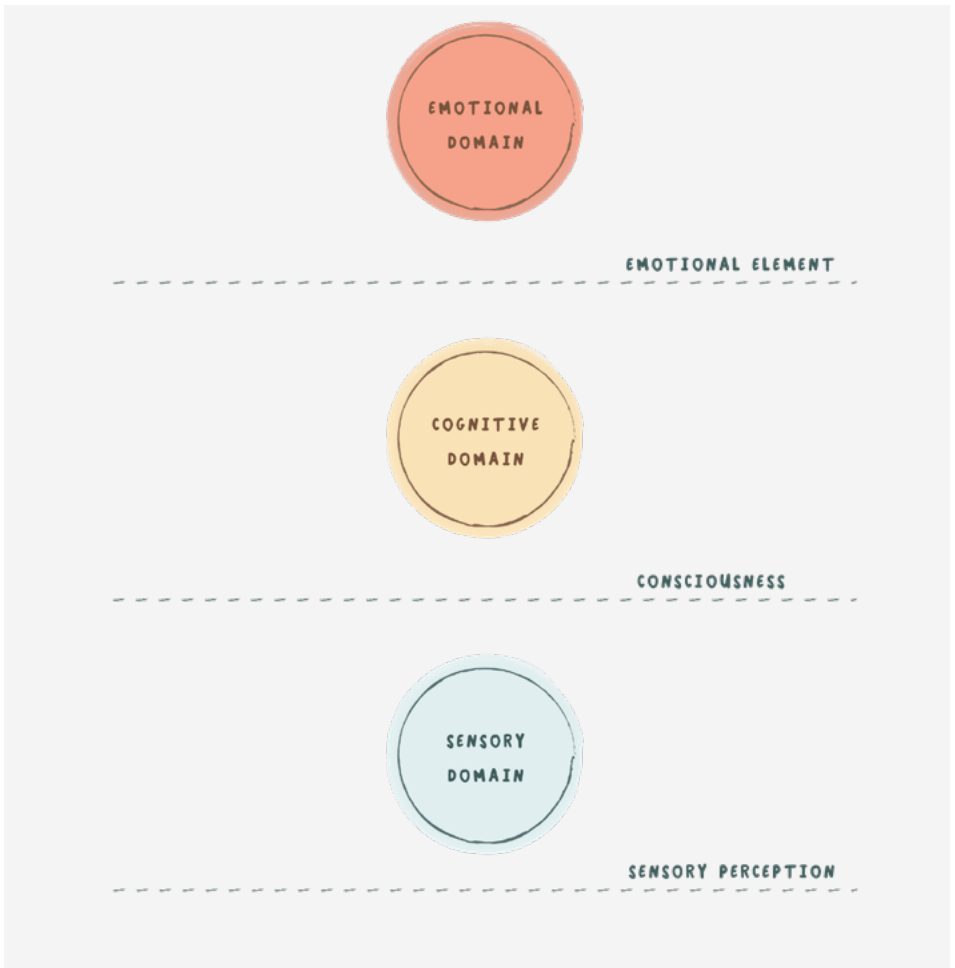


Figure 5. Gina Nadal, emotional experience's three-domain framework, 2021.

*Sensory domain* is the most basic level and involves direct sensory pleasure or pain. The *Conscious domain*, positioned in the middle, is the conscious recognition and satisfaction of an object. This level is subjective to the individual's background. The top level, *Emotional domain*, refers to the cognitive elaboration linked to an emotional experience, event, memory or person.

To arouse an *Emotional Experience* can be done in both ways, bottom-up or up-bottom.

### 3. Method

This study invites ten participants to analyse twelve woven textiles using sensory perceptions in order to assess the *Emotional Experience* in accordance with the three-domain framework. To gather and analyse the data a qualitative method, Repertory Grid Technique, is used.

#### 3.1. Repertory Grid Technique

The Repertory Grid Technique (RGT) is a method to proceed a highly structured interview, using the interviewee's own words and construction of the world. It was created by George A. Kelly (1955), an American psychologist, therapist, educator and personality theorist, to elicit constructs when investigating patients' personal relationships and situations in life under the umbrella of Personal Construct Theory.<sup>2</sup> Kelly introduced the idea that all individuals are experts in matters concerning themselves, acting on the basis of specific expectations (Baber, 1996; Bang, 2007).

The RGT requires the researcher's objectives to be determined during the general planning phase among other decisions that might affect the capture of data. As it is not completely standardised, different disciplines have adapted the core of the RGT to capture specific data. The RGT consists of:

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<sup>2</sup> Personal Construct theory is based on the development of people's theories about the world. In order to understand people's environments, they act as *Personal scientists* (Shaw, 1980; Zuber-Skerritt & Roche, 2004).

- (a) the *topic* of the interview, in this study the topic is *How sensory perception of woven textiles can elicit emotional experience*, which should represent the researcher's objectives and determines what the interview is about.
- (b) The *elements*, which represent the content area under study and illustrate the topic, twelve woven textiles are the elements of this study.
- (c) A *set of personal constructs* are created by the interviewee to compare and contrast the elements or presented by the researcher. The personal construct is the most important component of the RGT due to it describes what the interviewee thinks about the topic. The personal *Bi-polar construct* is presented as opposite ends of the pole. Zuber-Skerrit and Roche (2004) state that *bi-polar constructs* might have a clear opposition, but it is not a necessary requirement of *bi-polar constructs*.
- (d) The *rating system*, usually a rating scale based on 1-5, evaluates each element based on the bi-polar construct (Feixas and Cornejo, 1996).

The RGT is not postulated to the investigator's theoretical construct, rather it can be more accurately described as a personal-centred approach because it involves the study of a person's own theory and personal construct (Feixas, 1989) through interviews. Therefore, this technique can be a rich source of qualitative data as it allows people to express themselves in their own terms.

Yet, the RGT combines qualitative and quantitative methodologies as it can be analysed statistically because of the use of a rating scale.

#### 4. Participants

The participants in this study have been selected based on the following premise: eight young adults ages 18-35. The young adults are HE students from Art, Design and Media courses in the UK. They are required to attend 3 sessions over a period of a month.

#### 5. Textiles

The twelve woven textiles studied in this research are the following (Fig. 6):

1. Silk yarn with satin weave structure
2. Angora yarn with twill weave structure
3. Merino yarn with twill weave structure
4. Alpaca yarn with diamond weave structure
5. Cotton yarn with plain weave structure
6. Cotton yarn with twill weave structure
7. Linen yarn with diamond weave structure
8. Angora yarn with half basket weave structure
9. Linen yarn with herringbone weave structure
10. Angora yarn with twill weave structure (pointed draft)
11. Merino yarn with satin weave structure
12. Merino yarn with diamond weave structure

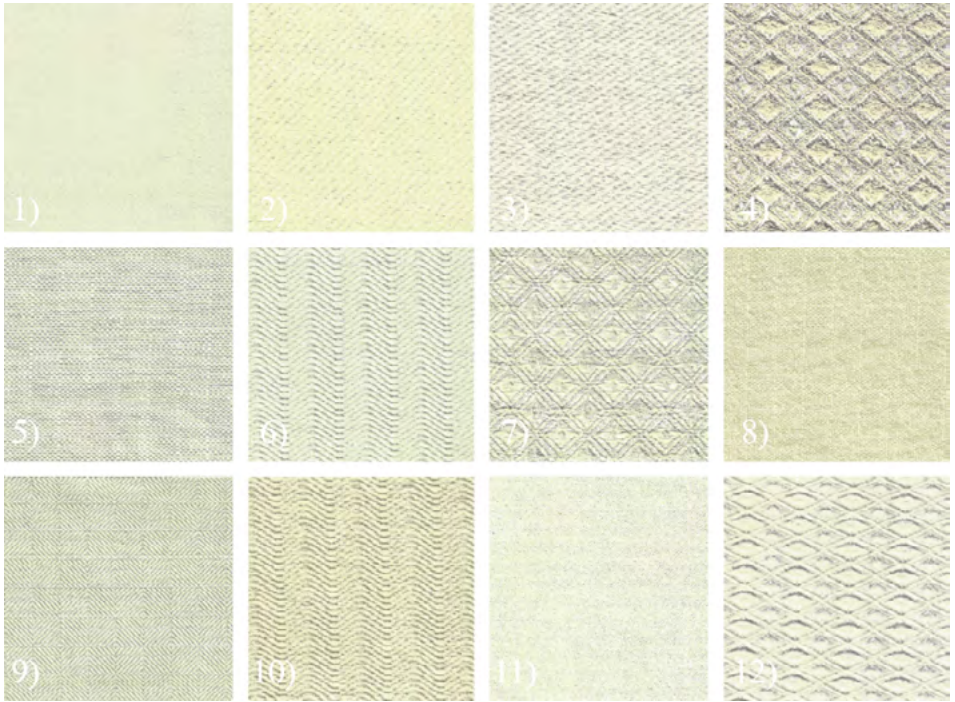


Figure 6. Gina Nadal, textile analysed during this study, 2021.

## 6. Sensory Perception

*Sensory perception* refers to the holistic process of interaction with materials, not only sensory properties of materials but individual's feelings beyond the sensory domain, including emotional and semantic domains (Karana et al., 2014).

While visual perception of materials includes colour of the surface and patterns, the tactile impression includes the object's weight, warmth, elasticity and softness (Overliet et al., 2016; Karana et al., 2014). During Schifferstein & Cleiren's (2005) research looking at similarities and differences between the roles of various senses in modulating multisensory prod-



uct experience, they point out that vision and tactile senses are equally successful in providing information about the object. Moreover, objects recognised by vision and touch are easiest to identify and associate with memories, people and places.

In a multisensory perception, the order of stimulus influences the final perception of the product. Vision is often the first sense to perceive certain object properties, the information received from other senses tends to satisfy the expectancies generated on the basis of the visual properties (Karana et al., 2014). For parity with previous research (Karana et al., 2014; Schifferstein & Cleiren, 2005; Overliet et al., 2016), the exploration mode used in this research for evaluating weaving textiles is first by touch, second by vision and third using both senses. In the tactile exploration, blindfolded participants are asked to freely explore the textile samples. In the visual exploration condition, the participants can only see but not touch the textile samples. Finally, in the visual-tactile condition, participants can use both senses together to explore the textile samples.

## 7. Results

The study aimed to create connections between the textiles, domains and evaluation mode. First the constructs were divided in the three domains framework developed for this research. In order to divide the constructs into the *Sensory*, *Cognitive* and *Emotional domains* the following considerations were accounted for. If the *bi-polar construct* showed a reference of the quality of the textile such as texture, yarn or colour then it belonged to the *Sensory domain*. On the contrary, if the construct showed a cognitive effort relating

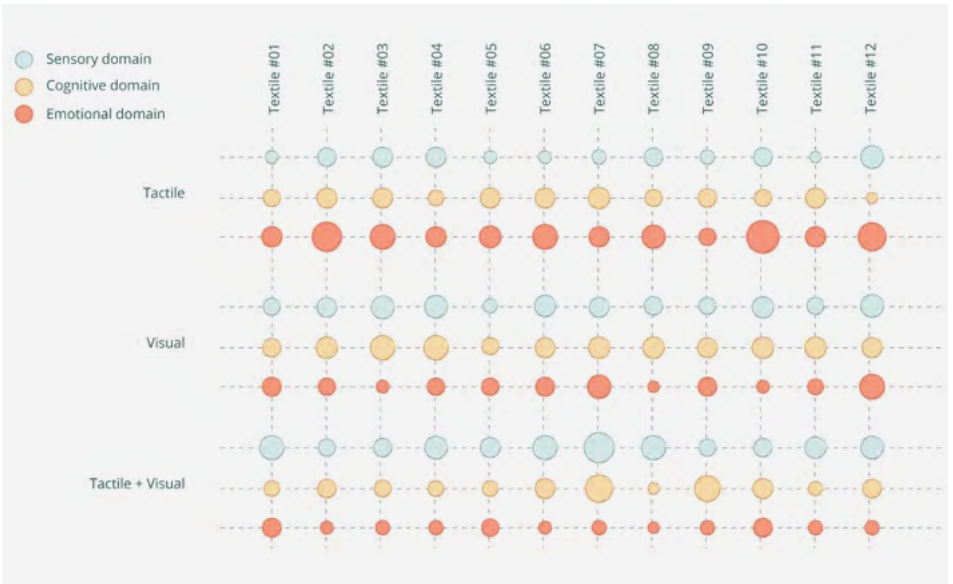
the textile to a specific situation or place then this construct belonged to the *Cognitive domain*. Finally, if the construct showed an emotional element or connection then it belonged to the top level, *Emotional domain*. For instance, a *bi-polar construct* that corresponded to the sensory domain was “smooth, I feel I don’t have anything on my hands”; a *bi-polar construct* connected to cognitive domain was “they look like things I’d own”; and an emotional domain *bi-polar construct* was “reminds me of receiving a post, nice experience”.

The focus of this analysis was to select the bi-polar constructs that elicit an emotional experience to the participants, whether they belong to *Sensory, Cognitive* or *Emotional domain*. For instance, participant 8 created a bi-polar construct composed by the construct “an ice-cream cone trip with grandparents” and its contrast “no emotional response”, therefore the contrast *no emotional response* was excluded from the analysis. Another example is participant 13, who generated a bi-polar construct, where the construct was “I don’t like them that much, roughness” and its contrast was “a party shine classy dress, wearing it. Nice experience” (Cloyd, 2014 July 29). The contrast was the one that has been analysed, while the construct was excluded from it.

In order to understand the patterns of the participants towards the *Sensory perception* of the textiles, the *bi-polar constructs* were divided between the method of analysis, whether it was analysed using tactile, visual or both senses together. 48 *bi-polar constructs* belonged to tactile sense analysis, 48 *bi-polar constructs* to visual sense analysis and 48 *bi-polar constructs* belonged to tactile plus visual sense analysis.

Construct 1	Textile 1	Textile 2	Textile 3	Textile 4	Textile 5	Textile 6	Textile 7	Textile 8	Textile 9	Textile 10	Textile 11	Textile 12	Contrast 5
I don't like them that much, roughness	5	4	3	1	2	2	4	5	4	2	3	2	A party shiny classy dress, wearing it. Nice experience

**Table 1.** Gina Nadal, example of selection of textiles based on the comments, 2021.



**Table 2.** Gina Nadal, connection between textiles, sensory properties and three-domain framework, 2021.

After the first division of the *bi-polar constructs*, the textiles with a close connection to the construct (1-2 scale-rate) and contrast (4-5 scale-rate) with emotional experience were selected. Table 1 shows an example of division based on one *bi-polar construct* of participant 13, where only the textiles that were given a number close to the contrast were selected. In this case, textiles number 1, 2, 7, 8 and 9.

Afterwards the *bi-polar constructs* were divided into the three-domain framework following the first analysis.

Table 2 shows the division between the evaluation mode (tactile, visual or tactile + visual), textiles and the three domains. The table does not provide a pattern to connect textiles to the domains and evaluation modes; instead it reaffirms the idea that the evaluation mode has an important role at the time to associate textiles to the *Emotional Experience* three-domain framework. For instance, during the tactile evaluation, the textiles were easily related to the *Emotional domain*, while the *Sensory* and *Cognitive domains* were stronger during the visual and tactile plus visual evaluations.

## 8. Conclusions

From the evidence of this study, it could be argued that Schifferstein & Cleiren's (2005) assumption of vision and tactile senses are equally successful in providing information about the object. In this study, participants showed that when analysing the textiles using both senses together *Sensory* and *Cognitive domains* had a similar impact, while *Emotional domain* had a higher number of constructs during the tactile evaluation. This research found out that each sense provid-

ed different information to the individual and challenges the idea that when objects are evaluated using both senses the identification and association of memories, people and places is similar (Schifferstein & Cleiren, 2005). The results from this study show that British adults in HE can relate easily to the *Emotional domain* when the woven textiles are evaluated using only the tactile sense, therefore it invites designers to introduce sense as a main element in their work and to understand which benefits of each sense in their projects. The sustainable action that designers can take from this research is that they first need to think and evaluate the individual's sensory perception and then create the product for the specific individual, therefore producing on demand instead of mass-production. The research also invites further study in the impact of introducing sensory perception as an important element of the design process on other geographical areas beyond the UK.

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V

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