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# Investigating Nuanced Sensory Experiences in Textiles Selection

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## **Abstract**

In this study, research tools are used to investigate designers' textile selection activities and uncover the sensorial experiences that underpin those activities. Such tools were purposely introduced to disrupt the way designers generally interact with textiles and generate conversations around it. The study was conducted in a textile fair during two consecutive years with an expert audience who were in the mind-set of sourcing. This study resulted in four main themes that reveal the importance of the multisensory experience to textile selection, and the complexity of remembering and communicating such experiences in the design process, given how tacit such experiences are.

## **Author Keywords**

Textiles selection; embodied experience; sensory perception.

## **ACM Classification Keywords**

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## **Introduction**

A review of the textile engineering literature investigating touch interaction with textiles shows that researchers have mainly focused on providing numerical and verbal descriptors to characterise textile properties and their perceived quality [3,4]. These

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## Box 1: STUDIES

**Context:** FFE held in London, UK, more than 50 international companies exposing their textiles

**Fair 1** (III edition, Sept. 2013)

Tool: iShoogle [7]

Participants: 24 experts - from the apparel industry (12), education (4) and others (8) – identified as PI# in the text

**Fair 2** (IV edition, Sept. 2014)

Tools: Pocket-tool; Sensory Tagged Media [1]; Sound of Fabrics

Participants: 14 fashion and textiles experts – identified as PII# in the text.

## Box 2: iShoogle



Figure 1. iShoogle tool showing fabric being stroked. iShoogle [2,7] is an interface that allows for interactive simulation of digital textile handling (synchronised movement and visual feedback) on a touch-based display.

descriptors only partially support designers during the textile selection process, as they need to synthesise not just technical information, but also sensory and affective experience around textiles, and their related meanings [8]. Unfortunately, as literature shows [6], articulating our tactile experiences is a challenging task. Hence, in this paper we introduced research tools to interrogate how designers interact and use their sensorial body to experience textiles during the creative process. Such research tools were purposely introduced to disrupt the way designers generally interact with textiles, and were brought in not as a solution, but to invite designers to reflect on how they interact with textiles from a sensorial perspective.

A textile fair was chosen as the setting as this is the most intense moment of textile selection, considering that the number of textiles at display is overwhelming, and that usually designers cannot take home samples from the fair, and have to wait until they are sent later by suppliers, also adding delivery costs. In such situation, how do designers select what to order? And what do they need to remember about the textile feel when back in their design space to select what textile they should order?

We conducted a study to understand how technology may help designers better understand their experience with textiles. The study was conducted over two consecutive years at a textile fair called Future Fabrics Expo (FFE), as shown in Box 1. The method and results from Fair 1 where previously reported in [8] in order to interrogate on the future of textiles sourcing and if digital tools would be desirable to facilitate the selection process. Here they are briefly reported and reconsidered in combination with the

results from Fair 2 for deeper insights into the sensory experience of textiles, which led to identifying the 4 new themes reported in this paper. The fair context offered a natural approach, where designers could be observed and questioned in-situ. The Future Fabrics Expo (FFE), which was chosen to host these studies, exhibits hundreds of textiles from more than 50 international companies and, as in many other fairs, visitors are not allowed to collect samples immediately but rather request them.

For both studies, the Local Ethics Committee at the University College London Interaction Centre approved the study, and participants provided written consent. Participants were recruited at the fair and had been identified beforehand as a specialist audience.

## The Study: Investigating the Use of Sensorial Information in Textiles Selection

This study aimed to understand what sensorial information is available and what information is actually used to support selection? To do so, we focused on the research question: *What sensorial information underpins the textile selection processes?* We took an iterative approach, and the contexts, participants, and tools are presented in the side box 'Context, Tools & Participants'.

### Fair 1

In Fair 1 a digital tool, the iShoogle [2,7] presented in Box 2, was introduced as a means to represent a phase in the design process where the physical contact with textiles is not available (after leaving the fair without samples). Participants were encouraged to interact with digital textile samples (see Box 2) provided through the tool and to express their impressions, prompted by

### Box 3: Pocket-Tool

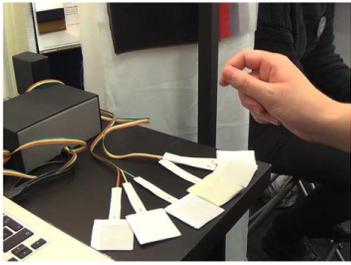


Figure 2. The Pocket-tool at FFE. The Pocket-tool is based on Arduino-based technology and it comprises a set of force sensitive resistors (1.75x1.5" sensing area) and six different textiles shaped in the form of small pocket within which the resistors can be inserted. All textile pockets are white or cream to reduce colour effects during the experience. When participants touch the pockets, the amount of pressure applied is captured by the resistors and visualized as line plots (one per textile) on a display.

### Box 4: Other tools

#### Semantically Tagged

**Media:** this lexicon created through previous research [1], using the terms Thick – Thin, Stiff – Flexible, Warm – Cool, Rough – Smooth, and was used by participants to convey their experience of touching textiles through a non-verbal manner.

**Sound of Textiles:** sounds were recorded from the textile samples used to build the Pocket tool while these were stroked.

open-ended questions displayed on a board to which their answers were attached using sticky notes.

#### Fair 2

Building on Fair 1, in Fair 2 the study presented a more complex set up where different concepts were explored through discrete research tools, assembled in the 'Textile Multisensory Toolbox' formed by the tool presented in Boxes 3 & 4. The prototype tools that formed this toolbox were not seen as final solutions but as disruptive tools. The aim was to get further attention to embodied sensorial experiences and to lead the designers to talk about their tactile experience with textiles. In the fair, a research corner was set up where a selection of textiles was exhibited in relation to the set of tools presented. Designers were prompted by open-ended questions in a contextual interview that followed the interactions with the tools. The questions were used as an interview guide (so their use was not strict).

#### Analysis

All data was transcribed verbatim. The Thematic Analysis method was used for systematic analysis of the data, following Braun and Clarke's [5] guidelines, and coding was conducted using QSR International's NVivo 11 software. The questions were used to guide the analysis, but focus was given to themes and sub-themes that emerged from responses, which are described below.

#### Revealing the multisensory richness of the textile selection processes

The results obtained from the combination of both fair studies revealed four new main themes that are summarised in Box 5: textile touch as a multisensory

experience, tacit knowledge in touch behaviour and experience, difficulty in communicating, and complexity of textiles selection. These and its subthemes are presented in Table 1, and further developed below.

#### Textile Touch as a Multisensory Experience

Designers discussed aspects illustrating how experiencing a textile is a rich multisensory experience, where tactile, visual, aural, and proprioceptive perceptions are reported.

*"Yeah, because when you feel a fabric, you're not just using your hand, are you? You're using your eye, and then you're listening, especially with some fabrics. They can be very loud, and then it might be smooth and loud, and that doesn't mean it's soft, so the noise will tell you. The visualization of the movement of the fabric is so important."* (PII7)

Designers revealed that the more sensory elements are highlighted to support selection the better, and that working with multisensory content enables them to gather a more complete understanding of the textiles.

*"I think that I would really get familiar with the fabric. Like, to have it all together, with all the senses, like hearing, and seeing how it moves also That would be great, to combine the different things."* (PII5)

Designers' understanding of 'feel' encompass both sensory stimuli and hand movement [8], which in view of both fair results indicates that proprioception also plays a role in forming the understanding of a textile. Initially, in Fair 1, the importance of physical touch was remarked by the views on the digital textile, which disrupted designers' selection. While interacting with

Box 5: Emergent Themes	
Theme	Subtheme
Textile touch as a multisensory experience	Multisensory aspects, combine different senses, engagement, exploration, movement of the textile, impression of the textile
Tacit knowledge in touch behaviour and experience	Information on how you touch, information on how other people touch, knowledge about touch behaviour
Difficulty in communicating	Communication, knowledge, understanding, importance of associations, being able to describe textile
Complexity of textiles selection	Need to touch, need to remember, need to familiarise, bring structure to selection, subjectivity in selection, importance of social interactions
Table 1: Themes and subthemes resulting from Fairs 1 and 2.	

interactive videos, designers noted the importance of understanding drape qualities [8], which they regarded as an advantage over current still pictures. Although they suggested that digital samples could inform them about the movement and texture, they still consider the manipulation of the physical fabric crucial for its appreciation. They consider that interactive videos would be useful in digital interactions (e.g. online sourcing), but still lack refinement for designers. Furthermore, designers believe that physical textile samples will keep being used, irrespective of technological advancements and changes within the industry [8].

*Tacit Knowledge in Touch Behaviour and Experience*  
*While intrigued by what they experienced with the digital textiles in Fair 1, participants expressed a need to see fabrics in applications (e.g. on a person), in different manipulations (e.g. zooming in and out), or revealing different aspects through verbal and visual descriptions and associations [8]. This need to see fabrics in diverse situations and with reference to the body (either by manipulation or seeing on a person), was also highlighted in Fair 2, and shows a relation between proprioception and the experience of touch, which reveals a very complex language of touch, one that is tacit.*

*"... if there was just a video of someone moving the fabric you know, taking it and scrunching it, or showing how the light reflects or maybe showing something else in a similar weight.(...) Probably it won't give you everything, just seeing people touching it, but it will definitely give you a feel, 'cause I'm guessing a lot of people touch similarly when they're looking for similar things." (PII10)*

The deeper insight from Fair 2 came from designers showing an interest and even excitement with the possibility to reflect and see *more information about how they touch* a textile, which was done in the case of the Pocket-Tool in a very basic manner. They regarded this as a means to support their explorations and consequently their understanding of a textile, after reflecting on their lack of awareness about their interactions with textiles. This was highlighted by an interest in seeing hands and seeing the lines plotted from the Pocket-Tool; and this includes information both about themselves or other people touching.

#### *Difficulty in Communicating*

As the designers were engaging with different tools, many aspects started to emerge in relation to what they do, or which are generally important for their experience in selection, rather than directly related to the working of the research tools. The predominant aspects were related to communication and knowledge about textiles. Most designers highlighted the importance of being able to articulate the experience and to communicate it to others at work.

*"I learned the importance of being able to describe a fabric to somebody else, or even communicating its properties to someone in your team, or maybe communicating to someone over the phone." (PII7)*

Such communication happens in several instances: when designers need to be able to explain to suppliers what kind of textiles they are looking for, or when only one designer from a team visits a textile fair, and they need to communicate to others what they saw once back in the studio without yet having samples to show.

*"Just you saw, and you took a picture of it, but it's like bad lighting. So that's all you have when you go home right now. And you know what you're talking about, but the other person won't." (PII10)*

Support would be welcomed at *initial stages of selection in communications* with suppliers, which are not a straightforward process, especially if the supplier is new and there is no prior experience to inform conversations.

*"I could show them what they're like without them having to take a trip somewhere, then I think that would be a good first step. And then, obviously, they'd want to see them in real life as well." (PII11)*

Besides facilitating their own understanding of the textiles, the content generated through this type of exploration could also support in *describing the textile* and therefore improving communication. This was already highlighted as something crucial for their experience of selecting textiles, and which presents difficulties, particularly when designers cannot articulate their subjective experience. If designers were able to better describe their experiences, they consider this would impact in aspects such as *engagement* in the fair context and beyond

*"I do like giving people more and more ways to describe it or think about it, or just, just more information in their heads. When they leave, they have a lot more. If someone asks them about their fabric, they're not like, "Uh, I can't really tell you." (PII10)*

#### *Complexity of textiles selection*

Participants considered textile selection an overwhelming process and in Fair 1 they mentioned that interactive videos could be useful as a filter before traveling to textile fairs [8]. Their reflections suggest that a tool would be useful for the initial stage of design (research and ideation), to understand the rich sensations provided by the textiles, before consulting suppliers [8]. This was reinforced in Fair 2, where designers again see it as *"a good first step. And then, obviously, they'd want to see them in real life as well"* (PII11). Designers stressed that the selection was so complex, that some *structure* would be welcomed, particularly in terms of searching before visiting the fair, to make the visit more efficient. Since designers were not able to take samples directly from the fair, they were interested in having tools that helped them to register and recall the experience. They reported difficulties in managing all the information they have to absorb, and that they lack support, as the only means they currently have to register their experience is by taking pictures.

*"At the moment you just take photos, which is great for just the kind of visual, but then a photo, you might even forget how thick it is or how stiff it is" (PII4)*

Designers made a point about the importance of leaving enough flexibility for *subjectivity* when introducing support, as this is a crucial aspect when thinking about how designers understand and select textiles.

*"As long as it is very representative. I mean, the thing is, it's quite subjective, isn't it? So one person might think that this is very smooth because of the way they*

*see it, but then someone else might think it's really rough and of not good quality or... so it's the subjectivity of it, I think, is very important.” (PII8)*

### **Conclusion**

This study introduced diverse research tools, which successfully encouraged designers to reflect on the textile selection sensory experience and to talk about it. Designers' voices were gathered around four main themes: textile touch as a multisensory experience, tacit knowledge in touch behaviour and experience, difficulty in communicating sensorial experience, and complexity of textiles selection. Of further critical import was the outcome whereby designers considered the physical presence as crucial in seeing and feeling fabric samples, interacting and communicating with stakeholders, and for sharing information about previous experience. These results will inform the development of support for designers' textile selection in order to introduce experiential aspects, beyond providing characterisations of the physicality of textiles only, as is currently done by textiles engineering alone.

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