IMAGINE IT

SENSORY EXPLORATORY PROCEDURES AS A VESSEL TO RECREATE SENSORY EXPERIENCES IN ONLINE SERVICESCAPES

Imagine it

Sensory exploratory procedure videos as a vessel to recreate sensory experiences in online servicescapes

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Dear reader,
Our senses mesmerize, poets and scientists alike. Numerous excerpts detail scents triggering a magic transportation to memories. Sensuous experiences are our doorway to the world. These mysterious yet ordinary sensor-tools, that we employ to perceive the world, result in the imaginations that shape the future.

I would like to express my sincere appreciation to all those who provided me with assistance during my research.

Thank you

I am eternally grateful for this learning journey and especially for the companions that walked beside me. Thank you for reminding me to smell the flowers.

Sincerely,
Manoux Klaassen

Abstract

Purpose – In online environments sensory experiences are hardly integrated. The complex challenge of integrating the senses online is often answered with high tech solution ideas, which are beyond the reach of most of the public and small and medium enterprises (SMEs). Utilizing a mixed methods approach this study investigates to what extent videos, which mimic multisensory exploratory procedures of product experiences in the physical servicescape, affect the consumers' sensory experience in the e-servicescape. By being the first study to couple natural exploration and video, to investigate the compensatory effects of SEP-videos in the apparel shopping context, this study adds novelty.

Methodology– In an exploratory qualitative pre-study, common product exploration procedures were investigated to gain insight into the exact SEPs of four products. Outcomes were used to produce the SEP-video. The quantitative main study employed a single-factor between-subjects design that investigated the effects of presentation methods on customer experience. The aim is to elucidate effects of SEP-video on customers experience in the context of online apparel shopping. An online survey (206 participants) investigated the effects of presentation method, mediated by imagery components, on attitudinal and behavioural outcomes. Need for touch was explored as a moderator.

Findings – A multivariate analysis of variance showcased that sensory imagery can be triggered by SEP-videos. No moderation of need for touch was found. Mediation analysis results indicate that presentation methods influence the outcome variables through two imagery measures. Surprisingly, the direct effect of presentation method negatively influenced purchase intention. Yet, the triggered imagery shows a positive relationship with purchase intention.

Conclusion and discussion – Sensory imagery can be triggered by SEP-videos, confirming it as a useful technique for SMEs. Results align with previous findings of the positive impact of imagery on consumer outcomes. This SEP-video technique can also be applied to more advanced technologies. The generated insights contribute to literature on sensory marketing, product presentation and imagery literature by applying this new technique. Furthermore, reduces the knowledge gap in the field of imagery product presentations. Due to the exploratory nature of this research, ample research opportunities were identified for future pursuits. It is a mere step on the long road of bringing our senses into the digital world

Keywords – Electronic commerce; Sensory exploratory procedure; Imagery; Video; Consumer behaviour; Attitude

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List of abbreviations

Abbreviation	Meaning
AR	Augmented reality
COVID-19	Coronavirus 2019 pandemic
CI	Confidence intervals
EFA	Exploratory factor analysis
E-servicescape	Online servicescape
KMO	Kaiser–Meyer–Olkin measure
MANOVA	Multivariate analysis of variance
NFT	Need for touch
RQ	Research question
SMEs	Small and medium enterprises
SEP-videos	Sensory exploratory videos
VR	Virtual reality

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1. Imagine it: sensory exploration videos as an improvement of the online shopping experience

Retail experienced a shift towards customer experience as well as a digital transformation, accelerated by the coronavirus pandemic (COVID-19) (Nielsen, 2020). In 2017, Grewal et al. (2017) already pointed to the rapidly evolving retail landscape in light of technological changes. However, trailing in COVID-19's wake of restrictions and lockdowns, severe socio-economic consequences forced an acceleration of the digital transformation (Donthu & Gustafsson, 2020; Soto-Acosta, 2020). Consumers were forcibly shifted online, to experience shopping through digital technologies, and companies needed to reconsider their digital strategies (Donthu & Gustafsson, 2020; Soto-Acosta, 2020). The virtualization shift accelerated and is predicted to persist and even evolve in the foreseeable future (Beckers et al., 2021; Chou et al., 2021; Das et al., 2021; Pantano et al., 2020). Notable growth in digital sales channels further increases competitiveness, forcing retailers to create enjoyable and engaging online servicescapes (e-servicescapes) (Chotipanich & Issarasak, 2017; Jai et al., 2021).

The e-servicescape has unique capabilities along with limitations, from both the perspective of customers and companies. Whilst e-servicescapes offer personalized service at relatively low costs and remove a variety of physical constraints (e.g., time, place), the absence of sensory exploration is evident (Krishna, 2012). Sensory exploration creates a holistic experience, predictably affecting both perceptions and behavioural outcomes (Bellizzi et al., 1983; Bitner, 1992; North et al., 1999; Reimer & Kuehn, 2005; Rompay et al., 2008). The purchase decision process in shopping contexts is significantly influenced by information gathered from stimuli (Elder & Krishna, 2010; Krishna et al., 2016). Consequently, the creation of multisensory customer experiences lead to competitive advantages for physical location retailers (Pine et al., 1999; Puccinelli et al., 2009). However, online environments miss these sensory rich experiences which lead to competitive advantages in physical stores. (Jahng et al., 2000).

Absence of sensory stimuli inhibits online sales and necessitates compensation methods, like the facilitation of returns, which are both costly and unsustainable (Citrin et al., 2003; Park et al., 2005). An alternative compensation opportunity is the online integration of sensory experiences, which would have several additional benefits. Companies gain competitive advantages and cost reductions on returns, whilst customers may better understand what they are buying. Reducing the number of returns reduces shipping amounts, benefiting the environmental impact of shopping. The question of how to stimulate the

multiple senses of customers in digital environments, leaves the industry with a complex challenge.

To advance knowledge on this challenge, research has explored different sensory engaging strategies. A diverse set of visual presentations can be employed (e.g. zooming, rotation or virtual fitting rooms) to increase consumers' favourable responses such as, positive product attitudes and purchase intentions (Algharabat et al., 2017; Kim & Forsythe, 2008; Park et al., 2008; Petit et al., 2019). Increasingly, more advanced technologies (e.g. augmented reality (AR), virtual reality (VR) and 3D presentations) gain popularity (Billewar et al., 2022; Petit et al., 2015; Petit et al., 2019). Moreover, Petit et al. (2019) discuss attempts to include multisensory experiences in the digital environment. One of the discussed examples is AR device MetaCookie+. MetaCookie+ allows users to virtually manipulate a cookie, in terms of appearance and diffused smell, to alter the perceived flavour. These sensory enabling technologies aim to offer convenient and enjoyable shopping experiences (Petit et al., 2019). Yet, these advanced technological solutions are often not (yet) suited for the greater public and beyond the grasp of most small and medium enterprises (SMEs).

Therefore, this research centres on a low-tech opportunity for the inclusion of sensory stimuli currently underrepresented in the online environment: smell, product sounds, taste, and touch. Building on existing work on haptic exploration (Klatzky & Lederman, 1992, 1993; Lederman & Klatzky, 1987), this research postulates that these exploration procedures might exist for senses beyond haptics. Sensory aspects of products are a large theme in research, but little is known about if and how consumer sensory experience can be mimicked in an online environment. Recognising this gap, the goal of this study is to explore a way of providing sensory rich information through accessible technology. Consequently, the following research question (RQ) is examined utilising a mixed methods approach: *To what extent can videos, which mimic multisensory exploratory procedures of product experiences in the physical servicescape, affect the consumers' sensory experience in the e-servicescape?*

The exploratory qualitative study included observations of product explorations to create insights into the existence of participants' sensory exploratory procedures (e.g., scrunching the fabric of a sweater) for a set of four products (sweater, socks, wine, desert). The identified common exploration procedures extracted from one product exploration (sweater), were subsequently turned into a video script to be used as input for the second study. To investigate the compensatory effects of sensory exploratory videos (SEP-videos) in the apparel shopping context, the main study had a quantitative nature. It employed an online survey featuring mock-up webpages that differ in presentation method

Contributing to the current body of knowledge, this research provides insights into compensatory effects of SEP-videos on customer outcomes, adding to literature on sensory exploration and the role of imagery in online multisensory experiences. As rich sensory experiences are lacking in e-servicescapes, online retailers may attain competitive advantages if they succeed to incorporate multisensory experiences in their online business. A sensory approach to product presentations could deliver the possibility of differentiation potential to relevant competition (Krishna, 2012). Thus, a practical contribution is the exploration of a sensory rich presentation method, which can be employed without the use of advanced technologies. If desired, this product presentation technique can be transferred to more advanced technologies. The insights into the method allow retailers to adapt this technique to improve their own online product presentations.

2. Theoretical framework

2.1. Sensory marketing and effects of sensory experience

Krishna (2010, 2012) defines sensory marketing as "*marketing that engages the consumers' senses and affects their perception, judgment and behaviour*". Sensory marketing engages all five senses and extracts the essence of products, to insert them in interactive experiences to assist decision making (Moreira et al., 2017; Nigam, 2012; Wiedmann et al., 2018; Williams, 2006). Well established sensory marketing frameworks, like the stimulus-organism-response paradigm (Mehrabian & Russell, 1974) and the sensory marketing framework (Krishna, 2013), express the interplay between atmospheric cues of the environment (stimulus) and behaviour resulting from the exposure (affective and cognitive responses).

Studies find that emphasizing sensory aspects of products increases the appeal of products and services (Krishna, 2010; Krishna et al., 2010). Sensory information cues influence customer outcomes like attitude, product evaluation, willingness to pay, purchase intention and customer satisfaction (Cornil & Chandon, 2016; Krishna et al., 2010; Kumar, 2014; Petit et al., 2015). Touch has shown to lead to greater confidence in product judgement, to enhance purchase experience and to increase the amount of money that consumers are willing to pay (Peck & Childers, 2003a; Peck & Shu, 2009). Smell has been shown to affect product evaluation and enhance memory (Krishna et al., 2016). Krishna (2012) suggest that substantial effects might be achieved by integrating multiple senses in a single message.

Seeing the effects of sensory experience on customer outcomes of attitudes and behaviour, the increasing attention to sensory experience is not surprising. If more of the senses (haptic, olfaction, taste) can be integrated in online environments, the earlier mentioned findings may be replicated for online consumer behaviour outcomes.

2.2. Reconstructing the sensory experience to incorporate it online

2.2.1. Exploring products: sensory exploratory procedures

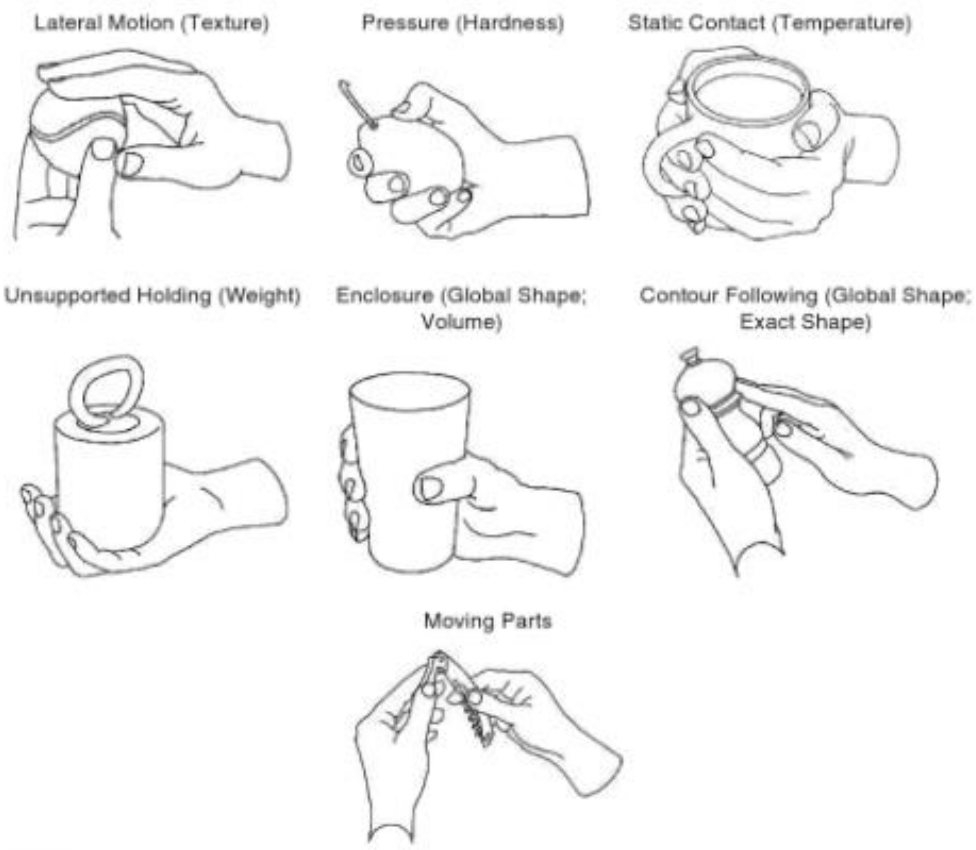
Fundamentally, our senses attain information about objects (McCabe & Nowlis, 2003; Peck & Childers, 2003a, 2003b). Sensory experience is essential as sensory information provides objective information for the target task, like touching a sweater to assess texture and thickness (Peck & Childers, 2003a). For example, when it comes to touch, explorers use particular hand movements to discover a product's attributes. Lederman and Klatzky (1987) called these tactile assessment movements exploratory procedures.

Exploratory procedures are linked to the attainment of objective information on item properties, by maximising sensory input corresponding to object specific property attributes

(Klatzky & Lederman, 1992, 1993; Lederman & Klatzky, 1987). An example is lifting and moving an object up and down to determine its weight (Figure 1). People assess different object properties through their senses, which suggest that they need distinct sensory experiences to attain product information on specific object property attributes. As exploration of products involves assessment of object properties through different senses, it is theorised that sensory exploratory procedures may well be performed for the different senses. To be able to transfer the actual sensory experience to the online environment, a basic understanding of the SEP assessment of object properties is fundamental. Yet, studies on sensory exploratory procedures, beyond that of haptics, are extremely scarce.

Figure 1

Overview of the exploratory procedures used to determine specific tactile properties of objects as shown in Sonneveld and Schifferstein (2008) adapted from Klatzky et al. (1985).



2.2.1. Product dependent experience: modality importance when assessing object specific attributes

As shortly mentioned before, the relative importance of sensory modalities is product dependent. Thus, the diagnostic contribution of the senses to the assessment of product attributes differs, which influences user-product interactions (Fenko et al., 2010; Schifferstein, 2006; Schifferstein & Cleiren, 2005). Schifferstein and Cleiren (2005) determine that, in many real-life situations, vision and touch likely dominate perception and experience of the product. This is aligned with Krishna's (2006) statement that, seemingly, vision dominates sensory modalities and is likely involved in all sensory experiences.

Exploration of products involves utilisation of the senses to assess different object properties (e.g., crisps taste and sounds of crispness). As a result, the need to assess properties varies across products and categories. For example, touch plays a significant role in the assessment of apparel, whilst taste and/or olfaction are central to the experience of provisions.

Consequently, constructing SEP-videos additionally requires an understanding of which modalities are involved in and of importance to the assessment of the object attributes. Hence, as insights regarding SEP assessment of specific product modalities are not widely available in research, a basic understanding of the product specific modality exploration is needed. Even if that is achievable, another obstacle arises: the actual experience of a product remains missing. Fortuitously, a substitution might be found in the consumers ability to imagine.

2.2.1. Shopping experience imagery: A possible surrogate for the direct sensory experience

Even prior to buying or using a product, the shopping experience takes part in the consumers' mind. When consumers consider alternatives or anticipatorily imagine their product experience, both the offline and the online experience depend on imagery (Shiv & Huber, 2000). Schifferstein and Hekkert (2008) indicate that consumers may imagine using products, and the resulting experience of that exploration, for each sense. For instance, customers may imagine how soft and warm a sweater will feel or how delicious that one wine will taste to the main course whilst soft Italian music plays on that new stereo. When products cannot be experienced physically, sensory imagery of product experience is particularly important (Schifferstein & Hekkert, 2011).

Instead of solely relying on customers own imagination of sensory experiences, customer imagery can be encouraged. Several studies show that presence of a product picture helps consumers create a better imagery of a product's taste, feel, smell, look, and sound

(Cian, 2012; Paivio, 1990; Underwood et al., 2001). Besides images, textual and verbal descriptions of the product (i.e. fabric texture) assist customers in overcoming reluctance (Rodrigues et al., 2017; Zeng et al., 2004). By providing as much information as possible, stores can facilitate customers imagining interactions to mimic sensorial experiences (Hye Park & Stoel, 2002; Levin et al., 2005; Okonkwo, 2010; Overmars & Poels, 2015; Rodrigues et al., 2017). Elder and Krishna (2012) theorise that, since our minds mentally simulate the experience, video experience can elicit similar behavioural consequences as actually interacting with the object.

2.2.2. Tying insights together: recreating sensory experiences online

Currently, the delivery of sensory information in the online environment mainly happens via visual or audio channels. However, input from other senses (haptics, olfaction, and taste) is often unattainable in an online context. Online assessments of senses beyond vision and sound (haptic, olfaction, taste) remains virtually non-existent. Thus, surrogates to incorporate these sensory experiences in the e-servicescape need to be found.

Based on the previous sections, a unique set of challenges arises when seeking to incorporate the other senses online. Firstly, not much is known about the existence of SEP performed for the senses beyond that of haptics. Secondly, as different modalities can be central in the assessment of object attributes, the central SEP modalities for different products need to be discovered. Thirdly, if appeal of the application should engage an entire population, commonalities in the SEP need to be identified. Lastly, a method to transfer the SEP exploration online in a lively matter is needed.

Video recordings can be used to lively transfer SEP explorations. However, to be able to mimic explorations in videos, more insights into SEP explorations of products and SEP commonalities are needed. If common sensory exploration of object properties can be captured successfully, it might provide a way to integrate SEP experiences otherwise provided by the actual exploration in an online environment. As the shopping experience already involves imagining sensory experiences and product interactions, imagery might be a promising surrogate to incorporate sensory experiences in the e-servicescape, especially when it mimics the physical experience.

2.3. Imagery

2.3.1. Construct definition, relevance, and importance

Imagery is of importance in any consumption experience and has a long historical research context containing ample controversies (Adaval, 2018). Elder and Krishna (2022) compile the current understanding of imagery, its relationship to memory, and the cognitive and perceptual resources utilized. Elder and Krishna (2022, p. 294) build on MacInnis and Price (1987, p. 473) for their definition of imagery: "*(..) imagery is a prospective, multi-modal sensory and cognitive representation formed from memory that is evoked automatically or deliberately*". This definition elucidates the sensory nature of imagery, its evocation, the role of memory in imagery formation, and how imagery differs from memory. The main focus of research lies on visual imagery, and even though recent literature explored beyond visual imagery, the area of sensory imagery requires more work (Andrade et al., 2014; Elder & Krishna, 2022; Krishna, 2012).

Being aware of the powerful effects of evoked imagery on behaviour, the relevance of sensory imagery rises as product interaction and sensory experiences increasingly turn into technology-based interactions (Elder & Krishna, 2022). Consequently, research needs to discover approaches to facilitate imagined product interactions. This extends imagery to the complete physical experience, incorporating all five senses. Elder and Krishna (2022) conclude that future research should explore new contexts as well as methods by which imagery is evoked.

Answering the call for more imagery methods, this research employs a naturalistic exploration scenario. It employs a video in which an actual product exploration is mimicked, to make the imagery as easy and automatic as possible. To investigate imagery, visual and haptic imagery as well as components of sensory imagination (vividness, ease, nature, and immersive experience) are explored.

2.3.2. Components of sensory imagination

2.3.2.1. Imagery vividness, ease, and nature of imagining.

In persuasion, components like imagery vividness and the ease of generating imagery play a significant role (Elder and Krishna, 2022). Vividness is influenced by stored knowledge, memory, stimulus complexity, available perceptual information and executive processes involved in retrieval and manipulation of information. Imagery vividness additionally depends on reactivation of sensory information. Imagery, for most people, may be most vivid for visual images (Kosslyn, 2005). Stimuli with high vividness that are easily remembered, likely lead to more positive consumer outcomes (MacInnis & Price, 1987).

This research tries to replicate sensory experience, by mimicking human product interaction in a video, to provide sensory rich information in the e-servicescape. This is expected to increase imagery vividness and ease of imagining, due to its resemblance to the actual product exploration experience. As the valence impacts imagery effects, the nature of imagining will also be considered.

2.3.2.2. Immersive Experience: Transportation and Captivation of the imagery medium

Next to imagery vividness and ease, another factor arises. The imagery may be influenced by the experience of the imagery medium. A broad spectrum of concepts and terms (e.g. flow, presence and immersion) are used to describe media experience. Rigby et al. (2019) present an overview of these concepts. This study focusses on immersion. Paraphrasing Murray (2017), immersion is the delightful experience when our engagement with a narrative engulfs and transports us into a simulated reality.

Whilst the objective is not transportation to a completely different reality, the goal is to transport and captivate participants into the sensory experience of item properties by means of the SEP-video. Investigating subjective media experience, Rigby et al. (2019) developed a questionnaire to measure immersion in video media. From this questionnaire the factors transportation and captivation were modified to suit the context of this study.

2.3.2.3. Overview of imagery hypotheses on vividness, ease, nature, and immersion.

Combined, these measures provide an appraisal of the imagery process in terms of sensory imagery, its vividness, ease, and nature. As well as the immersive experience of each condition. Drawing from the sections above, the following hypothesis was formulated:

Hypothesis 1 Participants will display higher scores on imagery measures when exposed to a presentation method featuring an SEP-video than when watching a regular website. This is explored for the following components:

(a) visual sensory imagery
(b) haptic sensory imagery
(c) vividness
(d) ease of imagery
(e) nature of imagery
(f) immersive experience: transportation
(g) immersive experience: captivation

2.4. Imagery dependent outcomes: attitudes and behaviours

2.4.1. Imagery effects on attitudinal and behavioural outcomes

Imagery has shown to improve attitudes towards products (Bone & Ellen, 1992; Rossiter & Percy, 1980), and evoke positive intentions as well as favourable behaviour (e.g., Schlosser, 2003; Shiv & Huber, 2000). Krishna et al. (2016) have demonstrated that simulation and imagery evoked by ad visuals, increased ad effectiveness. Research previously demonstrated that viewing touch increases purchase intention (Chen et al., 2022; Liu et al., 2018).

When it comes to the consequences of imagery, studies tend to explore the positive outcomes. The effect of evoked imagery may impact positively. However, the impact of imagery on consumer perception is not always positive, as shown by DeRosia and Elder (2019), Elder and Krishna (2012) and Lin et al. (2018). Thus, there is also a chance for negative effects regarding the attitudinal and behavioural outcomes. This research investigates the potential compensatory effects of presentation methods (SEP-video) on product attitudes, channel evaluations, product value and purchase intention.

2.4.1.1. Attitudinal outcomes: Attitude and Channel Evaluation.

Attitudes are a relatively enduring evaluative ratings or judgements about attitude objects, which can be products, places, people, and issues (Wood, 2000; Zanna et al., 2005). These ratings assemble in a direction (positive, negative, or neutral) and extremity (weak, moderate, or strong). Attitudes guide consumers' thoughts and actions and are based on cognition (belief), affect (feelings, moods, emotions) and behaviour. When it comes to online apparel, shopping attitudes tend to be more negative compared to products that require less sensory evaluations (Shim et al., 2001). To compensate for this need of direct experience with apparel, product methods and techniques enhancing (realistic) sensory experiences can be considered (Khakimdjanova & Park, 2005; Shim et al., 2001).

This research includes two attitudinal outcomes, next to attitudes towards the product this research also includes channel evaluation. Based on Ivana et al. (2021), the channel evaluation measures of credibility, convenience, along with visual design, information quality and service quality are included. The expectation is that sensory experiences facilitate ratings or judgements, leading to a more positive view on the channel. Thus, when customers are provided with more sensory rich content (SEP-video), it is expected that attitudes towards the product and the channel evaluation are more positive.

2.4.1.2. Behavioural Outcomes: Product value and Purchase Intention.

As discussed earlier, imagery can influence behaviour on several levels. For this research the focus lies on product value and purchase intention. Product value can encompass several dimensions, from individual and social, to functional and financial dimensions (Wiedmann et al., 2013; Wiedmann et al., 2007; Wiedmann et al., 2009). The focus of this research lies on the functional dimension of quality (Sheth et al., 1991) and the financial dimension (e.g. Ahtola, 1984) indicating the value of the product. Like the physical service scape, it is expected that the SEP-video leads to higher estimations of product value.

Purchase intention is the costumer's willingness to buy a product or service (BusinessDictionairy.com, 2017). The product information, as acquired via our senses or presented on visual channels, influences customers intention to buy (Kim & Lennon, 2000; Park et al., 2012; Peck & Childers, 2003a; Then & DeLong, 1999). Especially relevant are findings of Elder and Krishna (2012), that show that purchase intention is impacted by visual depictions that facilitate embodied mental stimulation. Thus, the experience of a SEP-video that mimics the product exploration should result in a higher purchase intention.

2.4.1.1. Overview of the outcome hypotheses

Building upon the research findings appearing in the previous sections, it is deemed likely that the effects of the presentation method on the attitudinal and behavioural outcomes are mediated by imagery. Based on that, the following hypothesis has been formulated:

Hypothesis 2 Imagery is a mediator that connects the presentation method to attitudinal and behavioural outcomes. The resulting effects of higher imagery levels are

(a) more positive product attitudes than customers with lower imagery scores
(b) more positive channel evaluations than customers with lower imagery scores
(c) a higher product value than customers with lower imagery scores
(d) a higher purchase intention than customers with lower imagery scores

2.5. Moderation by individual differences: need for touch

Individuals differ in their need for haptic experiences which in turn influences (online) buying behaviour and consumer experiences (Citrin et al., 2003; Peck & Childers, 2003a, p. 431). Need for touch (NFT) is defined as "*a preference for the extraction and utilization of information obtained through the haptic system*" (Peck & Childers, 2003a, 2003b). Peck and Childers developed the need for touch scale to reveal the individual differences between consumers (Peck & Childers, 2003a, 2003b). The multidimensional construct consists of instrumental (gather information) and autotelic (fun) touch.

Haptic information is more accessible to high NFT individuals, who additionally are faster at extracting information from objects (Peck & Childers, 2003a). For high NFT individuals, lack of direct experience decreases confidence in judgement, but this is not the case for low NFT individuals (Peck & Childers, 2003a, 2003b). Foreseeably, individuals with high NFT scores display an in-store channel preference (Rathee & Rajain, 2019), have greater quality concerns in online purchasing (Kühn et al., 2020), and are less likely to purchase online (Citrin et al., 2003).

NFT may well be product dependent, as it could be especially apparent in categories where touch is particularly diagnostic like apparel or bedding (Peck & Childers, 2003a, 2003b; Rodrigues et al., 2017). The variation in materials and shapes requires more interaction to evaluate apparel attributes in order to make a purchase decision (Cho & Workman, 2011; Grohmann et al., 2007; Jansson-Boyd, 2011; McCabe & Nowlis, 2003; Park, 2009). Both McCabe and Nowlis (2003) as well as Peck and Childers (2003a, 2003b) established that some material properties can be compensated for through the inclusion of a clear written description or a picture.

Hence, NFT is a relevant barrier for some customers to purchase online. As lacking the haptic experience influences individuals differently, which is especially relevant in cases where haptics is particularly diagnostic (i.e., apparel), NFT is expected to be a moderator.

Hypothesis 3 The effects of the presentation method (SEP-videos) on behavioural outcomes will be stronger for individuals with high NFT than for individuals with low NFT scores: NFT will moderate the relationship between presentation method and

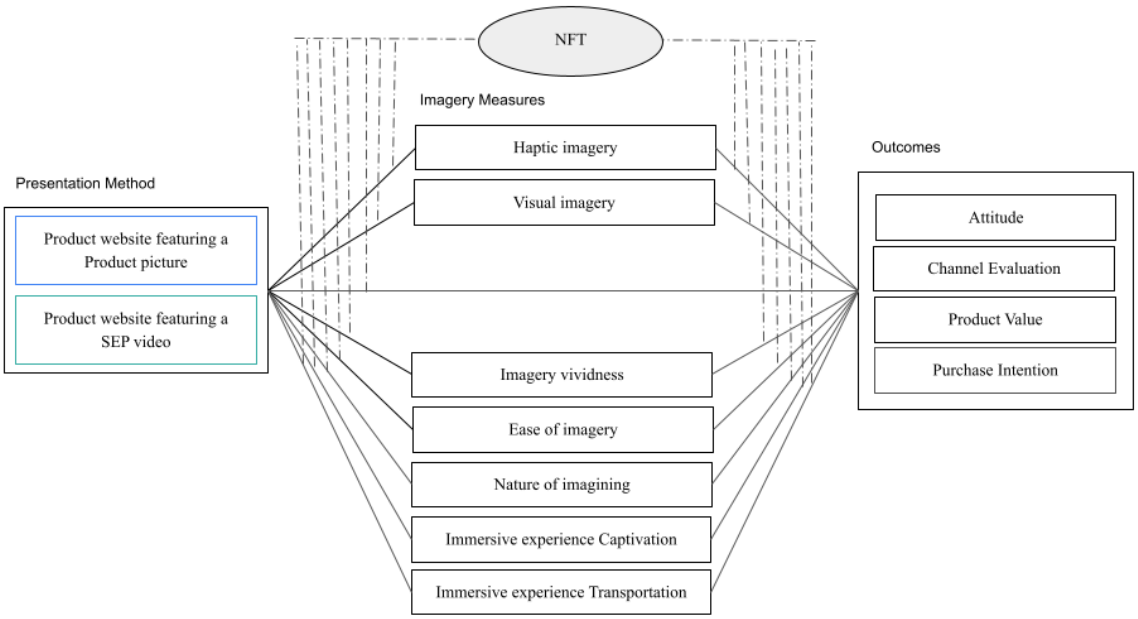
(a) product attitude
(b) channel evaluation
(c) product value
(d) purchase intention

2.6. Tying the bow: overview of the research model

Previous sections discussed various concepts resulting in the emergence of several hypotheses. The subsequent model includes four dependent variables: product attitudes, channel evaluations, product value and purchase intention. The imagery measures function as mediating variables, whereby NFT acts as a moderating variable. An overview of the research model is presented in Figure 2. Appendix 9.1 presents an overview of the research question and the hypotheses.

Figure 2

Research model displaying the concepts and their interrelationships



3. Explorative qualitative pre-study: generating the input for the sensory exploratory procedure video

3.1. Methodological approach

3.1.1. Research design

As determined earlier, the sensory experience may differ for each product. To create the SEP-videos, common product exploration procedures need to be investigated. In this exploratory pre-study, participants participated in a product test. The purpose was to gain insight into the exact SEPs consumers use to explore four products. Based on prevalence, two product categories were selected. From apparel a sweater and a pair of socks were selected. From provisions wine and chocolate dessert were chosen.

3.1.1.1. Product categories.

Apparel was the biggest category of online purchases in the Netherlands in 2016 and has a predicted annual growth of almost four percent worldwide between 2022 and 2027 (CBS, 2016; Statista, n.d.-a). The sensory attributes, like texture and stretch, are prominent. Additionally, most adults are experienced buyers of products from this category in both offline as online environments. Therefore, it would be logical to include products from this category.

Provisions is a regularly researched product category as the experience is very sensory: it involves vision, olfaction, taste and touch. Even audition influences food experience: the crunch sound of a crisp can indicate crispiness (Zampini & Spence, 2004). Furthermore, provisions are a big growth category in online purchases and are expected to continue growing worldwide by almost 6 percent between 2022 and 2027 (CBS, 2016; Coppola, 2022; Statista, n.d.-b). Shopping for provisions is a regular, for some even daily, task which can take place in both physical and online stores. Thus, products from this category were included in this research.

3.1.2. Sample

Selection criteria include the ability to comprehend and speak English. Due to health risks, pregnant and allergic participants were restricted from participation. Six participants (N=6, 4 male, 2 female) were recruited from the personal network of the researcher. All participants were over 18. Specifically, two were between 18-24, two were between 25-34 and two were older than 55. The average age was 37.

3.1.3. Procedure

Before the product test, a brief introduction and instructions were given by the researcher. In a questionnaire, participants electronically signed an informed consent form and filled in their demographics (Appendix 9.2). Participants were instructed to talk aloud while testing products.

Participants were presented with the four pre-selected products (sweater, socks, wine, and chocolate dessert) and asked to pick one product to start testing. After choosing the first product, participants were asked to explore it while thinking aloud. During this think aloud their actions and uttered thoughts were documented (observed, noted, filmed). The researcher documented the SEPs used and noted commentary for each product. For example: participant put on the sweater, rubbed over the fabric whilst it was on their arm and uttered "*I like that the sleeves are tightly fitted*"; or, participant is "*swirling the wine around in a glass*". When finished testing, participants returned to the questionnaire to answer questions regarding their experience. This sequence was repeated for each product: first testing, then answering the experience questionnaire.

After completion, the researcher reviewed the videos to be able to extract more or recover missed information. Combined input of the material determined the most common SEPs across the participants. These materials, based on the product experience, created the exploratory procedure lists. The finalised outcomes were subsequently turned into a script for the SEP-video (Appendix 9.5).

3.2. Results

The exploration table shows activities and comments for each exploration (Appendix 9.4). Participants indicated a product preference to be featured on a SEP-video, resulting in either the sweater or the wine. Participants named the ability to return an apparel/clothing item as a mitigating factor. Whereas differences in taste were deemed a limiting factor. Based on this input, the sweater was selected to be featured in the SEP-video. The script for the SEP-video can be found in appendix 9.5.

4. Quantitative Main Study

4.1. Methodological Approach

4.1.1. Research design

This study investigated the effects of a SEP-video, presented on a webpage, on customers experience. The aim is to elucidate the effects of SEP-videos on the experience of customers in the context of online apparel shopping. This study employed a single-factor between-subjects design. The independent variable was the product presentation format either followed the regular webpage set up (picture and text) versus a webpage that featured an additional SEP-video The dependent variables are product attitudes, channel evaluations, product value and purchase intention. Imagery measures (visual, haptic, nature, vividness, ease, immersion transportation and captivation) are expected to mediate the effects on attitude, channel evaluation, product value and purchase intention. NFT is deployed as a moderator.

4.1.2. Sample

The initial sample consisted of 218 participants recruited via a convenience sample. Selection criteria were age (18+) and English language comprehension. All respondents participated voluntarily, after reading and actively agreeing to the informed consent. Participants were asked to evaluate a website, veiling the exact purpose. The exact purpose was revealed in a debrief, where retraction of consent was possible. Twelve responses were excluded from the analysis, as the second ethical consent was not given, and the surveys were incomplete.

The final research population amounted to 206 participants (N=206, 51 male, 152 females, 3 non-Binary/prefer not to say). The age range was between 18 and 64 years (mean age 22.33 years, SD 5.77). A median split (Mdn = 5.17, SD = 1.13) divided NFT in high and low scores. Participants scoring above the median were classified as high NFT(n=102), those scoring below the medium were classified as low NFT (n=104). An overview of the descriptors of the final sample can be found in Table 1.

Table 1

Overview of the demographic characteristics of participants per experimental condition

Characteristic		Presentation method		
		Condition 1 Regular (Picture + written text)	Condition 2 Regular + SEP-video incl. spoken text	Total
Gender	Male	24	27	51
	Female	75	77	152
	Non Bin. / PNS	1	2	3
	Total	100	106	206
Need for Touch *(Median split)*	Low	49	55	104
	High	52	51	102
	Total	100	106	206
Age grouped	18-19	23	25	48
	20	24	26	50
	21-22	19	24	43
	23-25	21	19	40
	26-70	13	12	25
	Total	100	106	206
		(Mean 21.94, SD 3.45)	(Mean 22.70, SD 7.3)	

Note. Non Bin. /PNS = nonbinary or prefer not to say.

4.1.3. Procedure

Prior to commencing the study, the Ethics Committee BMS of the University of Twente gave their ethical clearance. The earlier described qualitative study provided the input for this quantitative part of the study. The selection of the sweater based on feedback and additional criteria in study one. A script served as input for the SEP-video featured on the mock-up website (see Appendix 9.5).

Utilising Qualtrics software, a self-administered online survey was conducted. The participants were provided an introductory text, containing the informed consent and estimated time spend on completing the study. The informed consent indicated a veiled purpose (“evaluation of a webpage”), stated the nature of participation (anonymous and voluntary) as well as the possibility of termination at any time and for any reason.

After electronically signing the informed consent, initial questions concerned the demographics of age and gender. As a significant skew towards the inclusion of women was expected, stratified randomisation was employed to equally distribute the genders across the two conditions. Thereafter, the survey commenced featuring a mock up product webpage followed by an evaluating questionnaire. Several adjusted pre-existing scales were employed to cover imagery, attitudes, channel evaluation, product value, purchase intention and NFT.

Constructs were measured on seven-point Likert type scales. Appendix 9.9 provides an overview of scales and sources.

Given the online nature of the study, the viewing apparatus (i.e., computer, laptop monitor or mobile device) and other materials used (i.e., headphones or speakers) varied between participants. This is most identical to the natural situation of participants engaging in online shopping. After collection in Qualtrics, data was exported to conduct the statistical analysis in SPSS. Analysis commenced once a total of 218 surveys were collected. Removal of 12 responses (non-consent) bring the participant total to 206.

Once the data collection concluded, identifiable data was removed from the data set. Scores of items were coded to the intended scores of 1-7 and reversed items were re-coded. Then, an exploratory factor analysis was employed to check the existing scales. This led to the final composition of items in each scale. Next, a mean score of the items resulted in the final scores.

4.1.4. Stimuli material

4.1.4.1. Mock up webpage.

Based on the existing product website of the sweater, two mock-up webpages were created. The survey employed two conditions, differing in audio-visual content (between-subjects design). A short instruction prompt was displayed above each condition: "*Imagine that you are browsing and come across this sweater. Please take a close look at this web page. On the next page you will answer questions about this specific product, so take a good look*".

To avoid effects related to brand sentiment, the stimulus website was created to be from a mock-up brand (i.e., 'faux-brand') to prevent impacts caused by the brand and its associations. The regular webpage condition displayed a traditional webpage which includes a product information text and multiple pictures of the product. The pictures included did not feature a model in them as to exclude gendering of the product. The SEP-video webpage was identical in terms of textual and visual description, with the addition of a SEP-video featuring below the pictures (see appendix 9.7).

4.1.4.2. Sensory exploratory procedure video.

The selected sweater was displayed on a wood top table. The video was created utilising a mobile phone (Google Pixel 6 Pro), hung from a beam using a tripod (illustration in appendix 9.6). The video was made in 4K (3840x2160 pixels). For optimal viewing across devices in the Qualtrics survey, the video was uploaded to YouTube as unlisted. Several considerations preceded the creation of the SEP-video which shows the exploration of the sweater.

The demonstrated movements stem from the script created based on the earlier qualitative study (Appendix 9.6). The duration of the SEP-video was 1 minute 30 seconds. The gendered-ness of the video was taken into consideration on multiple levels. Firstly, the selected sweater needed to be as gender neutral as possible. Secondly, the "point of view" perspective of the video merely shows lower arms and hands to make the video as gender neutral as possible.

Additionally, audio stimulation was considered to prevent "awkward silence" for the duration of the video. The video features comments based on the website text, as well as gentle atmospheric music.

4.1.5. Survey

4.1.5.1. Assessing survey measures: exploratory factor analysis.

Due to correlation of involved variables factor analysis generally requires a larger sample size whereby a sample of 200 is advised being fair (Tabachnick & Fidell, 2007, p. 588). The exploratory factor analysis (EFA) utilised a principal component analysis and varimax rotation, suppressing values below 0.449. The results, X^2 (N=206) = 8920,39 ($p < .000$), indicate suitability for factor analysis. The Kaiser–Meyer–Olkin (KMO) measure for sampling adequacy is deemed meritorious (KMO= 0.892) (Field, 2018, p. 798). Thus, the data is appropriate for factor analysis.

The factor solution yielded 12 factors accounting for 69.29 percent of variation in the data. The model fit is good, as 13% of the non-redundant residuals have absolute values greater than 0.05. The initial EFA revealed several items that failed to load significantly or loaded on different scales. The Factor analysis was re-run for each of the constructs to check each adequacy of the composition of scales. Outcomes are summarized in Table 3.

The division in components was confirmed for the imagery scale. The divisions in sensory imagery items, as well as the sensory imagery components of imagery vividness, ease and nature was confirmed. Sensory Imagery Items (8) loaded on two factors and was split into components of Visual (3) and Haptic items (5). A combined EFA would suggest removing Ease of imagining scale. However, in a separate EFA of the ease of imagery items, the scale was confirmed, and the alpha (.91) indicated the scale is reliable. Therefore, this scale was not removed to further analyse possible effects. The imagery component division of immersive experience, into captivation and transportation factors, was confirmed. Vividness, nature, captivation and transportation were deemed appropriate and loaded on one factor.

With regards to consumer outcomes. The attitude scale indicated two factors, due to item 1 and 8. Combining insights from the EFA and Cronbach's alpha these items were

removed. Purchase intention indicated a division attributed to one item, which was subsequently removed leading to a single factor. The factors of channel experience and purchase value were deemed appropriate and loaded on one factor.

In essence, all the theorised dimensions were confirmed except ease of imagining. However, this factor was retained for further analysis due to its performance on reliability scores. Scales were composed based on the insights; the construct means along with standard deviations were calculated. Table 2 features an overview of the scales, reliability scores, means as well as standard deviations and suitability of the factor analysis

Table 2

Overview of the scores of the factors in singular exploration

Variable	N Items	Reliability α	Means (SD)	KMO	X^2(n = 206)	*p*
NFT	12	.91	4.98(1.13)	.91	1575.11	< .001
ATT	6	.89	4.56 (.99)	.88	744.78	< .001
CE	5	.80	3.23 (.67)	.81	291.27	< .001
HAPT	5	.88	4.41 (1.27)	.83	593.87	< .001
VIS	3	.84	4.85(1.30)	.70	260.89	< .001
NAT	3	.85	4.73 (1.17)	.70	303.44	< .001
EAS	4	.85	3.96 (1.32)	.81	62.88	< .001
VIV	4	.71	5.31 (.92)	.74	160.17	< .001
CAP	7	.91	4.14(1.17)	.92	905.56	< .001
TRS	3	.82	3.28 (1.29)	.72	208.78	< .001
PI	5	.90	4.11 (1,33)	.83	6769.06	< .001
PV	2	.78	4.9 (1.05)	.67	173.43	< .001

Note. NFT need for touch; ATT attitude towards the product; CE channel evaluation; HAPT haptic imagery; VIS visual imagery; EAS ease of imagining; VIV vividness of information; CAP captivation; TRS transportation; PI purchase intention; PV product value

4.1.5.1. Overview of constructs scale measures and their reliability

The conducted study is based on existing scales that were adapted to the purpose of this study. Eight variables were evaluated utilizing multiple Likert type items on a 5- or 7-point scales to generate Likert type scales. Reliability of the scales was assessed using Cronbach'α coefficient. Scores above .7 are generally considered as satisfying and scores above .8 as good (Field, 2018).

4.1.5.1.1. Sensory imagery

Sensory imagery originally included 8 statements (*e.g., I felt that I could examine the texture of the jumper*) on which participants indicated the degree to which they agreed with the statement on a seven-point Likert scale ranging from strong disagreement (1) to strong agreement (7). Items were split into five haptic items (α=.88) and three visual imagery items (α=.84).

Similar conduct pertains to the other imagery measures. Ease of imaging (α=.85) included 4 statements (*e.g., I felt that I could examine the texture of the jumper*) and vividness (α=.71) included 4 statement items (e.g., *The image I got of the jumper is detailed*).

Nature of Imagery (α=.85) was composed of 3 range items and was rated on a 7-point Likert type scale (e.g., *The nature of imaging was Positive-Negative*)

Immersive experience items followed a 7-point Likert type scale. Captivation (α=.91) included 6 items (e.g., *To what extent did the content hold your attention*), whereas Transportation (α=.82) included 3 items (e.g., *To what extent did you feel like you were in the store environment*).

4.1.5.1.2. Product attitudes.

Originally product attitudes included 8 statements (e.g., "*I think that the product is inferior-superior"*) on which participants indicated the degree to which they agreed with the statement on a seven-point Likert type scale. Based on the EFA and Cronbach's alpha, items 1 and 8 were removed (α=.89).

4.1.5.1.3. Channel evaluations.

For channel evaluations (α=.80) participants were asked "*How would you rate this website*?". On a 5-star scale (0.5-star progressions), participants rated the website on credibility, convenience, visual design, information quality and service quality of the webpage.

4.1.5.1.4. Product value

Originally included 3 items (*e.g., "Products from this website are well made"*) that were rated on a seven-point Likert type scale ranging from strong disagreement (1) to strong agreement (7). One item was removed bringing Cronbach's alpha to .78.

4.1.5.1.5. Purchase intention.

Purchase intention included 5 statement items (α=.90) on a 7-point Likert type scale (*e.g., "How likely would you be to make a purchase?")*.

4.1.5.1.1. Need for touch

The entire NFT scale (α=.91) contains 12 items on which participants indicated the degree to which they agreed with the statement on a seven-point Likert scale ranging from strong disagreement (1) to strong agreement (7). Example questions are *"Touching products can be fun."* and *"I place more trust in products that can be touched before purchase"*. The population was divided in high and low scorers by employing a median split (Mdn = 5.17, SD = 1.13).

5. Analysis and results

To prevent brand recognition, a mock-up brand was created for the purpose of this study. To investigate the outcomes crosstabs were used. When asked if participants recognised the brand, the majority selected a version of not recognising the brand (159). The group that that feels uncertain about the brand recognition is 22 people. The group that indicated a version of yes accumulates to 25 which includes 18 that indicated probably yes, five yes and two indicated definitely yes. A plausible reason for the recognition is the strong impact a website design can have, as the basic design and pictures originate from an existing webpage.

Additionally, to check how attentive participants engaged with the page they viewed, a condition check was performed. Most people indicated the visual elements of the condition (90%) correctly. A mere 13 people indicated a wrong answer. Explanations can be found in visuals not loading correctly, wrong clicks or interpretation issues. As merely a minority did not pass these attention tests, the responses were kept.

5.1. Main effects of presentation method and need for touch on imagery and outcomes.

After the assumptions were checked[1], a multivariate analysis of variance (MANOVA) was conducted. The MANOVA explored presentation method and NFT as independent variables. Dependent variables were attitude, channel evaluation, product value, purchase intention, haptic imagery, visual imagery, ease of imagery, nature, and vividness of imagining as well as immersion experience captivation and transportation.

The hypothesised effects of presentation method and NFT on the imagery measures and behavioural outcomes were examined. For presentation method Pillai's trace (Field, 2018) reaches the criterion level (F (11, 192) =2.32, p=.01, $\eta_p{}^2$=.12). Thus, the sensory presentation method had a significant influence on imagery. However, NFT and the interaction presentation method * NFT did not reach the significance threshold (F (11, 192) =0.308, p=.98, $\eta_p{}^2$=.02). This leads to the rejection of Hypotheses 3, which details the moderation effect of NFT.

[1] Kolmogorov-Smirnov test (p >0,05) yet central limit theory & large sample size allow for assumption of normality, Box's M test (p= .001), Mahalanobis distance did not identify any outliers. Pearson correlations in appendix 9.10

5.1.1. Univariate results of presentation method.

A univariate ANOVA on presentation method effects showed significant effects[2] of presentation method on haptic imagery (F (1, 202) = 4.99, p<.03; η_p^2=.02), visual imagery (F (1, 202) = 4.51, p=.03; η_p^2=.02) and immersive experience transportation (F (1, 202) = 5.27, p=.02; η_p^2=.025). No significant effects were found for vividness (F(1, 202)= 2.53, p=.11; η_p^2=.01), ease (F(1, 202)= 0.03, p=.87; η_p^2=.00), nature (F(1, 202)= 1.76, p=.19; η_p^2=.01) and immersive experience captivation (F(1, 202)= 0.49, p=.49; η_p^2=.00). Thus, participants that watched SEP-videos have higher scores on imagery measures than those who viewed the regular webpage for haptic and visual imagery as well as transportation. Confirming hypothesis 1a, 1b and 1f and rejecting 1c, 1d, 1e and 1g. Further significant effects were found for product value (F (1, 202) = 6.22, p=.01; η_p^2=.03). Yet, no significant effects were found for attitude (F (1, 202) = .27, p=.60; η_p^2=.00), channel evaluation (F (1, 202) = 1.52, p=.22; η_p^2=.01), and purchase intention (F (1, 202) = 0.68, p=.41; η_p^2=.00).

The results indicate that presentation method (SEP-video presence) indeed influences imagery on the haptic and visual level as well as on transportation. However, the presentation method does not significantly influence most of the proposed imagery components. Merely one component, transportation of immersion experience, is positively influenced by the presentation method.

5.2. The mediation effect of imagery

The SPSS PROCESS macro Model 4 (Hayes, 2022) was applied to assess the mediating role of imagery measures on the relationship between product method and outcomes of attitudinal and behavioural nature (attitude, channel evaluation, product value, purchase intention). Because of the outcomes of the MANOVA, only the significant effects of the presentation method were taken into consideration. The bootstrap estimation approach of 5000 samples was employed for behavioural outcome run (Preacher & Hayes, 2008; Zhao et al., 2010).

The results reveal significant indirect effects of presentation method on the attitudinal outcomes. The reporting includes 95% confidence intervals (CI). As can be seen from figure 3, attitude is indirectly influenced through visual imagery (b= .06, t= 2.71, p<.01, CI [0.00, 0.14]) and transportation (b= .07, t=2.74, p<.001 CI [0.00, 0.17]). No direct effect of presentation method on attitude was identified. Hence there is full mediation of two imagery measures on attitude (Figure 3). This supports H2a. The attitudinal outcome channel

[2] Kruskal Wallis test showed similar results appendix 9.11 and 9.12.

evaluation is significantly influenced by visual imagery (*b*=.23, *t*= 6.42, *p*<.001, CI [0.01, 0.18]) and transportation (*b*= .10, *t* = 2.50, *p*=.013, CI [0.00, 0.09]). The non-significance of the direct effect of presentation method leads to a full mediation by visual and transportation measures (Figure 4). This supports H2b.

With regards to behavioural outcomes, the product value was significantly influenced through visual imagery (*b*= 0.21, *t* = 3.57 *p*<.001, CI [0.09, 0.33]). The direct effect of presentation method is insignificant, therefore there is full mediation of visual imagery (Figure 5). This supports H2c.

Purchase intention was significantly influenced through presentation method (*b*= -.34, *t*= -3.00, *p*<.05, CI [-0.68, -0.01]), visual imagery (*b*= .32, *t*= 4.14, *p*<.001, CI [0.00, 0.24]) and transportation (*b*= .25, *t*= 3.11, *p*<.01, CI [0.01, 0.25]). The direct effect of presentation method is significant and negative. Thus, a competing partial mediation of transportation was found (Figure 6). The total effect is negative, indicating that the SEP-video decreases purchase intention. However, the indirect effect of imagery positively influences purchase intentions. This partially supports H2d.

These findings partially confirm the hypotheses as three imagery factors mediate the relationship of presentation method and behavioural outcomes. A mediation analysis summary is presented in Table 3. Unstandardised path coefficients of the explored relationships can be found in Figures three to six.

Table 3

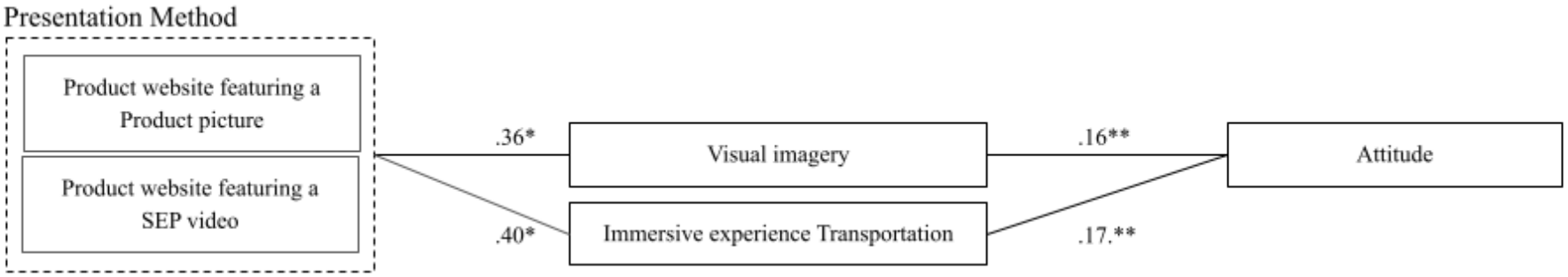
Analysis summary of the mediation (PROCESS model 4) analysis

Direct Relationship	Total effect	Direct effect		Confidence Interval bounds		t-statistics	Conclusion
				Lower	Upper		
PM→ATT	.07(.61)	-.07(.62)		-.33	.19	.51	No direct effect
PM→CE	.11(.24)	-.01 (.90)		-.17	.15	-.14	No direct effect
PM →PV	.36 (.02)	.19 (.15)		-.07	.45	1.44	No direct effect
PM→ PI	-.16 (.39)	-.34 (.05)		-.68-	-.00	-2.00	Direct effect
Indirect Relationship	Total effect	Direct effect	Indirect effect	Confidence Interval bounds		t-statistics	Conclusion
				Lower	Upper		
PM-→HPT→ATT	.07 (.61)	-.07 (.62)	.01	-.05	.08	.49	n.s.
PM→VIS→ATT			.06	.00	.14	2.71	Full Mediation
PM→TRS→ATT			.07	.00	.17	2.74	Full Mediation
PM→HPT→CE	.11(.24)	-.01 (.90)	-.00	-.04	.03	-.09	n.s.
PM→VIS→CE			.08	.01	.18	6.42	Full Mediation
PM→TRS→CE			.38	.00	.09	2.50	Full Mediation
PM→HPT→PV	.36 (.01)	.19(.15)	.06	-.00	.15	2.43	n.s.
PM→VIS→PV			.07	.00	.16	5.57	Full Mediation
PM→TRS→PV			.03	-.03	.11	1.25	n.s.
PM→HPT→PI	-.16 (.39)	-.34 (.05)	-.03	-.10	.03	-.95	n.s.
PM→VIS→PI			.11	.00	.24	4.14	Partial Mediation
PM→TRS→PI			.10	.01	.25	3.11	Partial Mediation

Note. if the confidence interval (95%) included zero the hypotheses was rejected.
NFT= need for touch, IM= imagery measures, PM: presentation method (condition), ATT= attitude, CE = channel evaluation, PV=product value, PI= purchase intention, n.s= not significant.

Figure 3

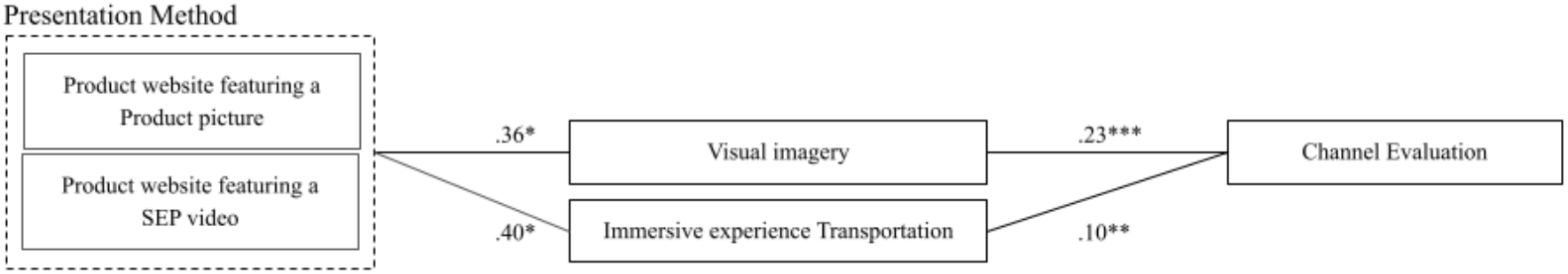
Model displaying the mediation of imagery components for attitude



*Note. *p<.05, **p<.01, ***p<.001.*

Figure 4

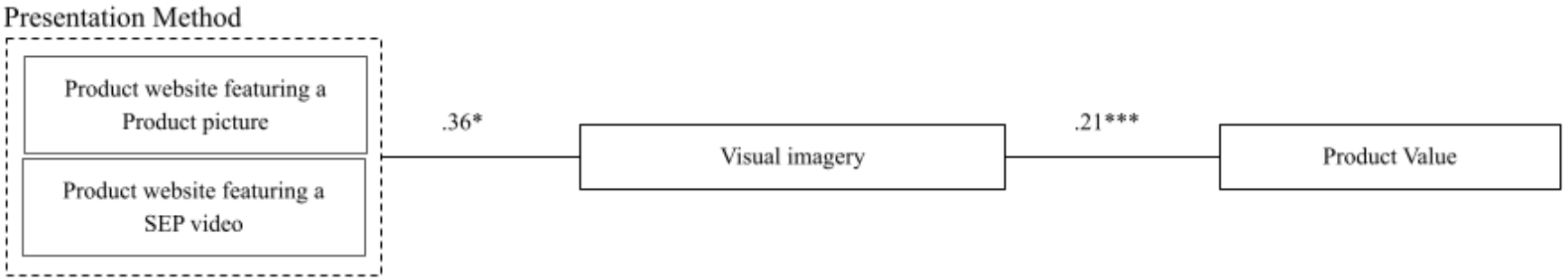
Model displaying the mediation of imagery components for channel evaluation



*Note. *p<.05, **p<.01, ***p<.001.*

Figure 5

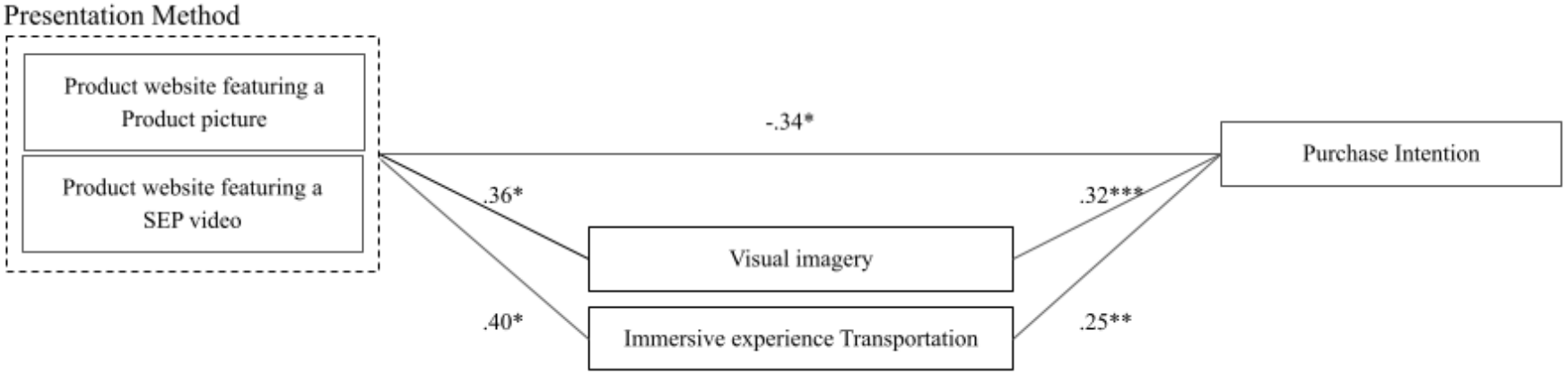
Model displaying the mediation of imagery components for product value



Note. *p<.05, **p<.01, ***p<.001

Figure 6

Model displaying the mediation of imagery components for purchase intention



*Note. *p<.05, **p<.01, ***p<.001..*

Table 4

Summary of results

Hypothesis	Sub hypothesis	Supported
H1 Participants will display higher scores on imagery measures when exposed to a presentation method featuring an SEP-video than when watching a regular website	(a) PM → HAPT	(a) Yes
	(b) PM → VIS	(b) Yes
	(c) PM → NAT	(c) No
	(d) PM → VIV	(d) No
	(e) PM → EAS	(e) No
	(f) PM → EI TRS	(f) Yes
	(g) PM → EI CAP	(g) No
H2 Imagery is a mediator that connects the presentation method to attitudinal and behavioural outcomes. The resulting effects of higher imagery levels are	(a) PM→ Imagery measure →ATT	(a) Yes, partial: VIS &TRS
	(b) PM → Imagery measure → CE	(b) Yes, partial: VIS & TRS
	(c) PM → Imagery measure →PI	(c) Yes, partial: VIS & TRS
	(d) PM → Imagery measure → PV	(d) Yes, partial: VIS
H3 The effects of Presentation method (SEP-video) will be stronger for individuals with high NFT than for individuals with low NFT scores;		No

Note. NFT= Need For Touch, IM= Imagery Measures, PM: Presentation Method (Condition), ATT= Attitude, CE = Channel Evaluation, PV=Product Value, PI= Purchase Intention

6. Conclusion

Before concluding this research paper, a small recapitulation of the research question and main aims of the research is appropriate. The research question was: *To what extent can videos, which mimic multisensory exploratory procedures of product experiences in the physical servicescape, affect the consumers' sensory experience in the e-servicescape?*

The investigation at the heart of the initial qualitative study was to explore and identify procedures across participants, to employ in the creation of a SEP-video. Findings indicated such procedures; these outcomes were used to create a script to serve as qualitative input for the video. The objective of the quantitative main study was to investigate the effect of the presentation method (regular vs SEP-video) through imagery (haptic, visual, nature, vividness, ease, captivation, and transportation) on behavioural outcomes (attitude, channel evaluation, product value and purchase intention). Main effects of presentation method were found on haptic imagery, visual imagery, and transportation. This confirms hypothesis 1a, 1b, and 1f.

The findings of this study revealed a mediation effect of two imagery measures on the outcome variables. Interestingly, this research found a direct negative effect of presentation method on purchase intention. Whilst contrary to the hypothesis, this finding is in line with DeRosia and Elder (2019), Elder and Krishna (2012) and Lin et al. (2018). Several possible explanations can be found. Firstly, the scenario is limited to a product participants might not be interested in. Secondly, by creating a more detailed product exploration participants may come to the realisation that this product fails to meet their needs, requirements, or expectations. Yet, imagery components seem to heighten purchase intention. Possibly improved sensory experience information facilitates the creation of a clearer mental product image leading to a reduction in risk perceptions. No moderation effect of NFT was identified, rejecting hypothesis three. The summarised findings are shown in table 4.

Rejection of the hypothesis on the moderation of NFT goes against expectations based on earlier findings (Citrin et al., 2003; Overmars & Poels, 2015) but is in line with findings of Park (2006) and Silva et al. (2021). A possible explanation could be that components influenced by NFT do not influence the effectiveness of the Presentation Method. Rather, there might be direct effects of NFT (autotelic and instrumental) on imagery components, like vividness, nature, and ease of imagining. This might be caused by the ability of high NFT individuals to tap into more eloquent sensory memories to engage in imagery. However, these effects were beyond the scope of this research. Similar to Duarte and Silva (2020), this study calls for future research to enrich NFT theory.

Whilst the findings of this study suggest more stimulation of imagery, this only holds true for visual imagery and transportation. For haptic imagery no significant results were found. The manipulation might not have been strong enough to bring it to the forefront.

Concluding, findings showcase that sensory imagery can be triggered by less sophisticated methods bringing it into the range of possibilities for small and medium enterprises. Results indicate that SEP-videos impact consumer behaviour across the dimensions of channel evaluations, product value and purchase intention (Hypothesis 2 a-d).

7. Discussion

7.1. Findings in context

This research contributes to imagery research by employing a sensory exploratory procedure technique embedded in a low technology presentation method, that of a video. Additionally, it highlights effects on consumer aspects of attitude, channel evaluation, product value and purchase intention. Collectively, the results indicate that SEP-videos are an effective medium to stimulate some components of imagery and consequently, influence behavioural outcomes.

The results align with findings of previous studies in online shopping by showing that imagery has a positive impact on consumer outcomes (Levin et al., 2005; Park, 2009; Park, 2006; Rodrigues et al., 2017; Wu et al., 2020). There is considerable support for sensory imagery from both behavioural and neuroscience research (Kosslyn et al., 2001; Mcnorgan, 2012). Yet, new contributions can be made to the field of sensory experience imagery and marketing (Elder & Krishna, 2022; Peck et al., 2013; Wörfel et al., 2022). Deeper finding discussions are placed under the component topics of sensory exploration, imagery, and the consumer outcomes on the attitudinal and behavioural level.

7.1.1. Sensory exploration

In the qualitative part of this research, apparel and provision items were explored. For both categories, common sensory exploratory procedures were identified between the participants. Differences between product explorations of sensory attributes can vary within the selected category attributes. For provisions it is very likely that the sensory exploration of fruit attributes, like smelling and pressing a pear for ripeness (Kappel et al., 1995), differ from the findings of the chocolate dessert and wine. Yet, the sensory exploration of ripeness may be similar across fruits. SEPs most likely exist for other categories like technology as well. Taking the example of a computer mouse, possible object attribute explorations could include tactile and audio inputs for the clicking (click pressure and sound) and scrolling (button texture, scrolling ease and scrolling sound).

Outcomes suggests that inferences about likely assessed attributes and the corresponding exploratory procedures can be utilised to create mappings or scripts to inform all disciplines researching the senses. Remarkably, there is no existing handbook of explorations documenting and categorising sensory explorations along common attribute assessment points of each sense. Qualitative research on a grander scale could aid in creating a common knowledge base on sensory explorations for attributes across product categories.

This can facilitate continuity across all disciplines involved in sensory research as well as innovative thoughts regarding the future inclusion of the senses in the online environment.

7.1.2. Presentation method and imagery

Interestingly, evidence suggests a negative direct effect of presentation method on purchase intention. This partially contradicts the expected positive result, as the imagery mediator influences purchase intention positively. This dynamic requires further examination. Possible explanations can be found in effects caused by the video, like triggering consumer contamination or influencing the assessment of product suitability. Findings raise questions about how the imagery effects on purchase intention influence actual sales and returns. Per chance, improved imagery results in less sales. Yet, it might also lead to less returns as the customer already better understands the product attributes.

Mediation effects of imagery were found and indicated positive effects for a few imagery components. However, it also paves the way for several discussion points. Insignificant effects of haptic imagery implicate that the video can be optimised for this kind of imagery. Optimalisation options are to select materials with even higher demands for haptic input (e.g., a fluffy angora pullover) as well as the multisensory inclusion like the sounds the exploration creates (e.g., the soft swooshing sounds of the hand over the fabric). Much like the high-quality sound recordings commonly used in autonomous sensory meridian response content, good quality sound recordings could improve the video's performance regarding the stimulation of haptic imagery. This expectation is based on congruency effects and cross model correspondences (hearing and feeling softness) similar to the sound and taste cross modal correspondence (Knöferle & Spence, 2012; Peck & Childers, 2003b).

To further intensify the effects, the embodiment in e-servicescapes could be taken into consideration. Building onto embodied cognition findings, might further amplify haptic imagery in online environments. For example, by using a modification of the rubber hand illusion experiment. This technique activates a vicarious haptic effect that makes the online hands feel like your own (IJsselsteijn et al., 2006; Luangrath et al., 2022).

The non-significant effects of the presentation method on other imagery components are also worth discussing. A potential explanation is that NFT directly influences the experience of vividness, nature, and ease of imagery which then in turn relate to sensory imagery. This can also be where other individual differences might show their effects. Possibly, the relationship paths are different than expected. Structural equation modelling could aid in visualising the complex relationships between presentation methods, imagery components, sensory imagery, individual variations, and other components chosen to explore.

7.1.3. Attitudinal and behavioural outcomes

All outcomes were significantly influenced by visual imagery, confirming existing literature on imagery effects on consumer outcomes. However, the manners by which these effects are created remain veiled. The immersion experience component was found to influence attitude, channel evaluation and purchase intention. This component seems to mostly impact the attitudinal outcomes. The exact interplay of imagery components on the outcomes remains obscured. Do the components of vividness, ease and nature feed into the sensory imagery or are other components causing or impacting these sensory imagery effects. Further insights into factors at the root of imagery could provide inputs to tailor videos to increase the sensory imagery effects found in this research.

7.2. Limitations and future research

Whilst enlightening, no study is without limitation. Limitations, however, establish opportunities for future research. This research includes the typical biases associated with online studies. Additionally, the collection method led to more experienced participants, possibly leading them to understand the purpose of the study, which might have had an influence on results. Due to the many components in this kind of research, future works could employ structural equation modelling which was beyond the scope of this research. Overall, the SEP-video showed its impact. Optimalisation of presentation of the procedures and the related sensory inputs could improve imagery overall, which also hold for the imagery of other senses. This research provides a solid foundation for future research. Limitations and opportunities for further research have been thematically divided for further discussion.

7.2.1. Sensory exploration and modalities

Drawing from the conclusions, implications from the qualitative study suggest that SEPs are likely applicable beyond the researched categories. Future research could continue the exploration started in the qualitative part of this study. As mentioned earlier, future qualitative research can contribute to a sensory exploration handbook that details SEPs per attribute to facilitate continuity and innovation of the utilized techniques in sensory research.

The quantitative part employs a mock up website containing an SEP-video featuring the exploration of a sweater. As only one product was explored in the second study, it remains unknown whether the results can be extended to other categories and products. As the central modality for apparel is the sense of touch, touch was the dominant sense highlighted. However, the investigation can be expanded by replicating the study for other products with different dominant sensory modalities (sound, olfaction and/or taste). As imagery recreates an

experience, possibly comprised of multiple modalities, interactions between different imagery types seem likely and warrants investigation.

Regarding the created imagery an uncertainty remains; are the achieved effects merely temporary or do they persist in the long run. Considering the continued interaction with the products after purchasing, and the possible role imagery might play in continued interaction satisfaction, insights would be particularly relevant for imagery research. Imagery impacts might additionally show up delayed. If the video leaves impactful images imprinted on customers minds, those doubting could be convinced by their own memories at a later point. This justifies replication of the study in a more realistic setting.

7.2.1. Improving sensory exploratory procedure videos

Various improvements can be made to the video materials of this exploratory research. As discussed earlier, future research can improve the inclusion of haptics in the SEP-video presentation. For instance, by including more senses into the video like audition. This is due to earlier mentioned effects of congruency and cross modal correspondence (Knöferle & Spence, 2012; Peck & Childers, 2003b). Whereby earlier mentioned elements like vicarious touch, embodiment and (psychological) ownership are opportunities to dive into. A research set-up similar to Luangrath et al. (2022) could be employed to investigate this.

Future research could also explore improvements to the sensory video that concern the duration and tempo. Whilst within the boundaries of one to two minutes (Fishman, 2016), social media clips tend to be shorter and more attention grabbing than the video utilised in this research. Shorter and higher tempo clips might improve captivation, making it more memorable. Compiling aspects of highly effective clips on social media, to integrate successful tactics into the SEP-video, may additionally improve video performance.

During the pandemic, the amount video presentations of products has risen as stores tried to reach their customers without them physically visiting the store location. Some stores recorded videos, whilst others held Instagram or Facebook “live” events where the products were showcased. Application effects of these dynamic visuals on imagery, its outcomes as well as possible channel effects (e.g., Instagram/Facebook/TikTok) could prove insightful. Theories like consumer contamination (Argo et al., 2006, 2008; Baek & Oh, 2021; Luangrath et al., 2022) suggest that the point of view may also impact consumer outcomes but the direction of the effects remains up for debate. Elements future research could investigate are presentation method attributes (e.g., point of view, live or recorded), the channel attributes and other social media associated effects like trends in videos.

7.2.1. Individual differences

This research included merely one individual difference, but many other individual differences might influence the process. Instances of individual differences that were not accounted for are left or right handedness (Dawes et al., 2020; Elder & Krishna, 2012; Krishna et al., 2017; Krishna et al., 2016), visual impairments (Cattaneo et al., 2008; Dulin et al., 2008; Seo & Jung, 2022) and other visual or mental (dis-) abilities. This study did not account for viewers with visual impairments. This type of multisensory content heavily relies on visual information. Adjusting this method for the visually impaired warrants further research. Especially relevant in this study, is the ability to generate imagery. Extreme examples of this difference in ability to generate imagery are individuals with aphantasia, who lack the ability to voluntarily generate visual imagery, or hyperphantasia who have photo like visualisations (Dawes et al., 2020; Keogh et al., 2021; Whiteley, 2021). A study into how individuals that struggle with imagery experience sensory marketing would form an opportunity for researchers to learn more about sensory marketing and its effects.

7.2.1. Research setting and scenario: connection to the actual experience

The research setting entailed a fictitious brand and an artificial scenario. As the exploration has shown significant effects, a replication of this exploratory study in broader society would strengthen the findings of this study. Future research can step beyond this fictitious scenario to further investigate the effects of SEP-videos.

Similarly, this fictitious purchase situation limits the customer journey to a single contact point and product. Making the setting even more realistic, one could think of partnering with a store like “wehkamp.nl” which sells apparel and furniture. This would allow testing under an actual A-B buying scenario which can include more elements of the customer journey as well as the effects on delayed buys and return rates. The experience of actual webpages can influence the measured variables, think of design elements and loading time, as webpage elements impact website usability and interactivity which in turn impacts consumers experience. This then triggers either irritation or satisfaction which subsequently might impact intention to use the website (Belanche et al., 2012; Gehrke & Turban, 1999; Hasan, 2016; Islam et al., 2021) This might skew participants evaluation, thus replication in an actual purchase setting could result in different outcomes.

Extending the research towards the actual experience with the product at home, could prove interesting for a multitude of reasons. Regarding the sensory experience anticipation effects, diagnosticity and ownership effects might play a role. Anticipation build by viewing SEP-videos might influence the physical product experience at home in unexpected ways and

influence factors like satisfaction and trust. Deduction would suggest that product exploration generates expectations which impact the evaluation on receiving the product at home. Thus, as not meeting the raised expectations could lead to disappointment with the product and distrust towards the webpage, the perceived diagnosticity of SEP-videos could play a role in this scenario too. As earlier discussed, delayed effects of imagery likewise demand investigation.

7.3. Theoretical implications

Implications of both theoretical and practical nature flow from this research. Employing a variety of methodologies to elucidate the phenomenon, is considered a best practice for doing boundary-breaking, marketing-relevant consumer research (MacInnis et al., 2019). The current research approach combined qualitative observations, common in fields like anthropology and design, with quantitative outcomes. This study established commonalities of consumer exploration to create SEP-videos. These SEP-videos were then employed in a quantitative online survey research. The results advance marketing knowledge of how consumers explore products as well as how their attitudes and behaviours are affected by SEP-videos within virtual environments.

Findings of this study support the existing body of work on imagery. However, the study adds novelty to the literature on imagery. It explores and documents consumers multisensory product explorations in addition to advancing a low-tech presentation technique featuring the found SEPs (Klatzky & Lederman, 1992, 1993; Lederman & Klatzky, 1987). Contributions are the examination of the effects of employing low tech solutions to include senses beyond the visual sense. It additionally advances work on visual cues as a method to influence consumer outcomes. As this research had an exploratory nature, ample research allies were identified for future pursuits.

7.4. Managerial implications

Beyond contributing to the academic aspects, this research also fills a specific knowledge gap within product presentation literature. It can assist online retailers in better understanding consumers, thus enabling the development of more effective websites for their target customers. By creating understanding of the customer experience of the exploration, insights about characteristics and attributes can inform online product presentation. The importance of imagery is underlined as it forms a possible compensation for the disadvantages of online shopping. It could negate the reluctance barrier caused by the intangible nature of online shopping. Online retailers can utilize these insights to develop more effective online retailing websites. Possible results could include a better understanding of the product features, which

in turn could less returns. This is good for all parties involved as it reduces costs (company) and provides better information, possibly resulting in less disappointment and more satisfaction with the service (customer). Next to that, less shipping is more environmentally friendly.

The main takeaway is that SEP-videos influence imagery components through which outcomes are impacted. Optimalisation for the sensory inputs of each sense could improve effects. Online content creators benefit from this work as well, providing a technique to support in creation of unboxing videos. These are becoming a central source of product information and experience, creating a connection to the sensory product experience otherwise missing online. It shines a light on daily product experiences of consumers which academics and practitioners could explore to further the development of interfaces that improve consumer experience as well as decision making whilst also limiting costs by decreasing returns.

As a revolution of the retail industry is happening, the virtual experience of customers increases in importance. The advances on computer-mediated environments and sensory experiences contribute to a long road of bringing our senses into the digital world. This research informs on product presentations and can guide designing product experiences. This accessible method allows all kinds of companies to experiment, but it is a mere step in the evolution of senses online. More and creative insights can impact the future…

Just …imagine.

8. References

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9. Appendix

9.1. Overview of Research Question and Hypotheses

Research Question

To what extent can videos, that mimic sensory experiences with a product in the physical servicescape, affect the consumers' sensory experience in the e-servicescape?

Hypotheses

Hypothesis 1 Participants will display higher scores on imagery measures when exposed to a presentation method featuring an SEP-video than when watching a regular website. This is explored for the following components: (a) visual sensory imagery (b) haptic sensory imagery (c) vividness (d) ease of imagery (e) nature of imagery (f) immersive experience: transportation (g) immersive experience: captivation

Hypothesis 2 Imagery is a mediator that connects the presentation method to attitudinal and behavioural outcomes. The resulting effects of higher imagery levels are (a) more positive product attitudes than customers with lower scores (b) more positive channel evaluations than customers with lower scores (c) a higher product value than customers with lower imagery scores (d) a higher purchase intention than customers with lower imagery scores

Hypothesis 3 The effects of the presentation method (SEP-videos) on behavioural outcomes will be stronger for individuals with high NFT than for individuals with low NFT scores: NFT will moderate the relationship between presentation method and product attitude (a), channel evaluation (b), product value (c) and purchase intention (d).

9.2. Study 1: Informed consent form for the Sensory Product test

Purpose of the research

When you shop, you explore objects with all your senses. You look at them, pick them up, sometimes you try them out in several ways. The purpose of this research is to see how customers explore products and what they experience. I want to discover what experiences customers want and need for the tested products.

Procedures

This research will involve your participation in a product exploration journey. In this you can freely explore the products provided to you one by one. The exploration can last up to 10 minutes per product, but if you need more or less time to satisfy your exploration needs this is also perfectly fine. During your exploration I would like you to tell me about what you are doing and what you are experiencing. Your experience will help me understand experiences of customers better.

Your participation in this research is entirely voluntary. You do not have to take part in this research if you do not wish to do so. You may stop participating at any time that you wish.

Participant Selection

You can participate in this study if you are above the age of 18 and are able to express your experiences in English. Pregnant women and others who are not allowed to drink alcohol are excluded from participation in this study. You should also NOT be allergic to:

Eggs	Milk	Nuts	Gluten	Sulphite
Wheat	Soy	Cacao	Alcohol	

If you do not meet the requirements, select: I do not want to participate.

Duration

The research takes place for ca. 60 minutes. In this time you can explore the projects as you like.

Confidentiality

The information you provide me with will be treated confidentially. The private information collected by this research project will be kept private. It will not be shared with or given to anyone. The overall outcome from all participants, about what needs and wants customers have will be presented in my thesis which will be publicized by the University of Twente. This Publication will NOT contain your name. If you wish, you can receive my thesis after my graduation.

Who to Contact

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact me: NAME

Phone: ********** E-mail: **********

I have been invited to participate in research about the sensory experience of customers. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked, have been answered to my satisfaction. I consent voluntarily to be a participant in this study

☐ I agree to participate. ☐ I do not agree to participate.

9.3. Study 1: Products for the product test

9.3.1. Apparel: Textured Knit Jumper

9.3.2. Apparel: Socks

9.3.3. Provisions: Chocolate Desert

9.3.1. Provisions: Wine

9.4. Study 1: Overview of exploration of the sweater.

In the table below the experienced of the participants were captured. A final question was what products they would like to see a sensory exploratory video. The choices often were the sweater (shows what it looks like (on a model)) and Wine (explained in simple terms, more understandable> easy language). Participants indicated the difficulty to assess taste and smell, which are difficult to assess but important for wine and desert but concerns about the individual judgements of taste were mentioned as complicating factors for online presentation of items of the consumptions category. The ability to return items from the apparel category was mentioned as a risk mitigating factor when shopping online.

Table 10.4 The sensory exploratory procedures for the sweater from the clothing category.

Participant#	Seeing	Touching	Hear	Smelling	Taste
Participant 1	Model: turtle neck Colour Looks soft Looks at pattern more closely Looks at label “oh it’s made in Bangladesh”	Turtle neck Rubs fabric with thumbs Stretches the turtle neck and the bottom Checks seams Holds it up Puts the sweater on Strokes over the fabric on the arm “I like that the sleeves are tightly fitted” Stretches bottom again. After taking it off , takes closer look at the fabric> weaving and possible mistakes	-	Smells fresh out of the store	-
Participant 2	“A turtleneck?!” Colour Look at knit pattern Looks at label: “hm made in Bangladesh, noooo!” Looks at the seams. “Yellow?! Who uses Yellow?!” Inspects pattern closer> mistakes	Slightly coarse Rubbing movement Stretches Neck, middle and bottom Texture> rubbing Stretches “fluffy” - “soft but coarse”		Smells a little piercing like store.	
Participant 3	Knitted and a turtleneck Looks at size: “unfortunately a size M’” Unfolds Holds in front of body “Already looks to short so I will not try it on” Warm winter sweater especially due to the turtleneck “anthracite” colour	Stretches and rubs “Elasticity is good” Stretches turtleneck. Moves hand over fabric Folds the sweater again.		Smells like store.	

Participant 4	Looks at sweater checks colour "Nice, knitted pattern" "a little bit, male colour" Looks at label (size m , big-ish) Materials & location, care "Mh made in Bangladesh..." Probably stays pretty, easy to wash"	Feels, rubs, and stretches the turtleneck "Crunches" the fabric. Holds unfolded sweater in front of body "The right length" Stretched sleeve with arm "also fits" Crunches sweater and rubs over it.	
Participant 5	"I don't really like turtlenecks; I wouldn't pick it up very quickly myself" "Colour is just a normal grey. There is a bit white in there that creates a "shine"" "It's size M, but looks very big" "It already has a fuzzle, this could mean there are many more coming!" Looks at the seams and inside Looks at label: "oh I can iron it and use softener! Softener is probably because else it's not so soft." "It's Cotton which is nice!"	Looks at the knit closer and moves hand over it. "It is not very soft" "it's a bit thin" Stretches & rubs over fabric Holds in front of body "It is a bit long, almost a dress" Puts it on "need to check the fit" "The fabric doesn't feel very stiff" Moves around in it -"this is not a size m , this must be bigger" Rubs, crunches, and strokes the fabric	Smells clean, like a store.
Participant 6	Looks at label "Washing instructions, so i know how to wash it" "Let me check what this is made of" Checking the seams and the finish. Holds sweater up and looks at it.	Grabs and rolls the turtleneck Rubbing Clenching the fabric Testing the stretch Press the fabric together "I have to know if it creases easy" Stretched the turtleneck again Stretches sleeve and bottom Puts the sweater on to check fit **Head does not fit through** "this is why I want to fit it before buying	

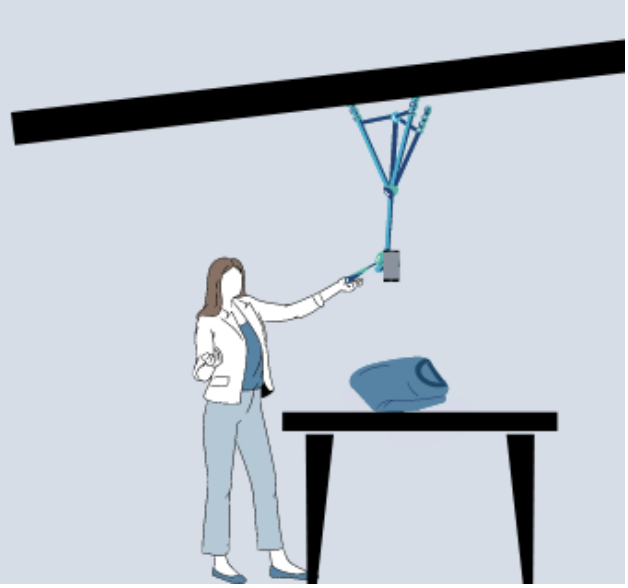
9.5. Study 1: Outcome SEP-video script

Generalised description	Precise examples [*vocalisation] [*indication*]*	Text spoken to part
Grabbing the sweater and moving it towards oneself	"Flat hand on top of the sweater" "Grabs sweater sides with both hands" "Grabs the sweater and directly looks at the cowl"	
Touching the fabric	"Moves over the fabric with the fingertips" "Moves fingers up and down over the fabric" "Rubs thumb over the fabric [sideways]" "Flat hand moves over the fabric" All these actions were often repeated several times during the exploration -nearly in some sort of dance"	This winter pullover
Holding the sweater up	"Grabs the top of the sweater and lifts it up" "Grabs the cowl and then the shoulders"" "Grabs the top, and hold between fingers [thumb on top, 3 fingers under]" "Holds sweater up [*good length too*]" "Grabs sweater by the shoulder an lifts sweater into the air in front of self"	is made with a structured knit
Looking at the sweater as a whole	"Looks up and down and up again holding the fabric [also pays special attention to the cowl]" "Grabs sweater by shoulder and looks at the length of the body"	and has a turtleneck.
Placing sweater in front on table	"Places sweater on the table [holding the shoulder] and pushes it [with flat hands] further onto the table]	The colour is dark grey-blended.
Rubbing the fabric	"Rubbing [up-down] the cowl" "Rubs the cowl's fabric between fingers" "Rubbing the fabric of the sleeve" "Rubs over the fabric with both thumbs[thumbs on top fingers below]"	The pullover is made from a soft cotton blend
Looking at the cowl	-	Which is composed of 55% Acrylics and 45% Cotton
(Un-)Rolling the cowl	"Rolling and de-rolling the cowl- then stretches (...) stretches again [*stretch maar niet té*]" Rolls cowl-[kijken wat voor maat het eigenlijk is- medium. Vrij grote medium]" "Looks at the un-rolled cowl again and stretches it" "Rolling and- un-rolling the cowl with fingers- proceeds to stretch it lightly and looks at the seam and structure of the cowl" This often takes place in combination with stretching and closer look into the structure and/or seams.	
Assessing the structure with hands	Follows after or during "Exploring the structure of the sweater: "Moves over the fabric with a flat hand [up/down/sideways] " Moves flat hand over fabric whilst saying [*it has a bit of a knit structure*]" "Moves a flat hand over the fabric then makes a scratch movement with thumb" "Holds the fabric and traces the structure with fingers" "[*voelt fijn aan*] Moves fingers and hand in a circular movement over the fabric]"	

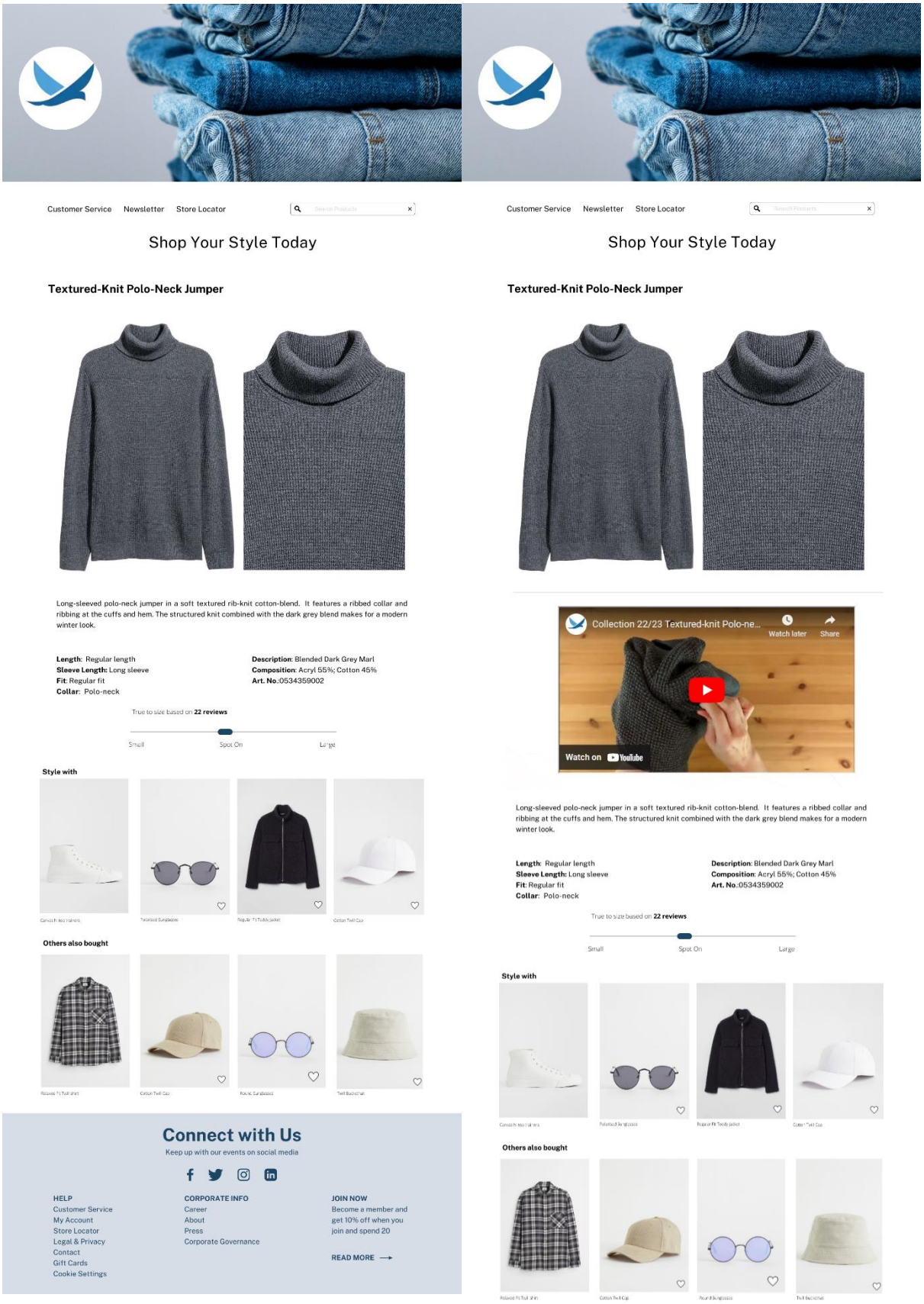
	"[*wel grappig met textuur*] Makes a sweeping motion over the fabric repeatedly, sometimes with the fingers other times with the palm of the hand."	
Kneading and the Squeeze-Release	"Pushes the fabric together in a bulb and squeezes it with hands- (left- then right) [*feels nice*] "Rubs with one hand on the inside of the fabric, then grabs the fabric with the hand and squeezes it firmly and repeatedly [kneading](..) stretches fabric and repeats the kneading. (...) Holds fabric between both hands and presses fabric together with both hands (compression & decompression)" "Folds fabric together and pushes it together [*of het snel kreukt*] (...) Makes a fist and then a pressure/rubbing movement with the fabric in hands" "Makes a kneading movement with rubbing movements of the thumb whilst squeezing and releasing the fabric"	
Washing movement	"One hand inside the sweater, the other outside [fingers spread] rubbing together both hands [in a washing movement]" "Rubs the fabric between both hands "	The sweater is machine washable at 40°
Pinching	"Pinches fabric together with thumb and index finger- pulls up and stretches sideways(..) On arm plucks the fabric in a reoccurring sideways movement " "Plucking movements with the fingers over the fabric"	
Seam look & Stretch	"Grabs bottom seam again" "Flips the seam and looks at the finishing (...)Stretches the seam with the thumbs moving opposing sides [thumbs on the outsides and fingers on top] [*lekker elastisch*] "Looks at bottom seam moving towards the other seams and traces the seams with one finger(then looks at the outside seams (..)stretches the bottom seam."	
Checking sleeve length	"[*Let's check if the sleeve fits*] Puts the shoulder seam at the shoulder and places the fabric on arm [holding between pinkie and palm]	
Checking stretchiness again	"Moves bottom: stretches sideward- moves in small upwards/downwards movement(...)stretches bottom fabric-rolls the seam around " "Stretching bottom seam- flips to inside and stretches again"	
Holding the sweater up (again)	"Grabs the shoulders of the sweater- holds it up"	The soft cotton together with the dark grey blend
Folding up the sweater	"Puts sweater down- folds in the cowl- pressed the cowl down " "Folds sweater- looking all parts again, stroking the fabric and folding it with a "tap-sweep" on the fabric every time" "Folds sweater but stretches body middle and rubs with thumb again"	gives this structured knit pullover a modern winter look.
"Tapping" out on the folded sweater	(Presses hands into fabric (..)"tapping" movement of both hands simultaneously (flat, palm down) " "Presses both hands into the fabric(...) 2 Taps on the fabric" "Folds and "taps" the fabric with a slight lean in"	

9.6. Study 2: Illustration of the research set up

A tripod was hung from a beam, the mobile phone (Google Pixel) was attached to the tripod to accomplish a view from above the product- to simulate the point of view you have looking down to your hands. An IKEA table with a light wooden top served as the presentation space.



9.7. Study 2:Website Manipulation Side by side (video version cut off)



9.8. Study 2: Results from the EFA: items and factor loadings [loading for isolated EFA]

Rotated Component Matrix

	Component										
	1	2	3	4	5	6	7	8	9	10	11	12
NFT1_A					,845[,883]]							
NFT2_A					,589[,647]]							
NFT9_A					,755[,783]]							
NFT12_A					,854[,970]]							
NFT5_A				,489[,856]]	,540[,508]]							
NFT7_A					,811[,846]]							
NFT3_I				,787[,780]]								
NFT4_I				,740[,730]]								
NFT6_I				,727[,755]]								
NFT8_I				,778[,757]]								
NFT10_I				,760[,767]]								
NFT11_I				,751[,769]]								
ATT_1	- [,522]											,643
ATT_2	,661[,773]											
ATT_3	,741[,701]											
ATT_4	,691[,724]											
ATT_5	,794[,835]											
ATT_6	,779[,835]											
ATT_7	,761[,849]]											
ATT_8	- [-]											
CEV1							,676[,785]					
CEV2							,564[,732]					
CEV3							- [,668]					
CEV4							,712[,785]					
CEV5							,649[,755]					
HAPT1_RC			,783[,839]]									
HAPT2_RC			,802 [,835]]									
HAPT3_RC			,782[,817]]									
HAPT4_RC			,681[,789]]									
HAPT5_RC			,699[,749]]									

VISU1_RC						,734 [,856]]			
VISU2_RC						,754[,891]]			
VISU3_RC						,677[,793]]			
IMEAS1_RC						- [,768]]			
IMEAS2_RC						,472[,849]]			
IMEAS3_RC						- [,844]]			
IMEAS4_RC						- [,874]]			
IMNAT_RC1					,723[,914]]				
IMNAT_RC2					,695[,905]]				
IMNAT_RC3					,655[,826]]				
VIV1_RC								,703[567]]	
VIV2_RC								- [,792]]	
VIV3_RC								,524[,779]	
VIV4_RC								,479[,790]]	
IE_CAP1		,751[,880]]							
IE_CAP2		,646[,727]]							
IE_CAP3		,716[,711]]							
IE_CAP4		,810[,881]]							
IE_CAP5		,706[,813]]							
IE_CAP6		,780[,885]]							
IE_CAP7		,539[,758]]							
IE_TRS1							,639[,852]]		
IE_TRS2			,481				,506[,851]]		
IE_TRS3							,680[,861]]		
PI1	,533			,633[,816]]					
PI2				,716[,867]]					
PI3				,790[,885]]					
PI4				,824[,875]]					
PI5				,596[,791]]					
PV1	,520					-			
PV2						,466[,906]]			
PV3					,483	,571[,906]]			

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 10 iterations.

9.9. Study 2: Questionnaire components

Scale	Sub-scale	Items	Cronbach's α
Product attitude (Orús et al., 2017; Park, 2006)		I think that the product is… not useful–useful bad- good inferior-superior boring-interesting unappealing-appealing unpleasant-pleasant undesirable-desirable common-unique	.86
Product value		How much would you enjoy using this item How would you judge the quality of this item Products from this website are well made	.76
Channel evaluation product evaluation scale of (Aydınoğlu & Krishna, 2019)		How would you rate this website? Credible Convenience Visual Design Information Quality Service Quality	.85
Purchase intention		I would like to try this product I would seriously consider buying this product How likely would you be to make a purchase?" – extremely unlikely to extremely likely I intend to buy products on this website I would recommend the website to my friends and family.	.90
Imagery 7 point Likert (Strongly disagree—Strongly agree) (Bone & Ellen (1991) and McInnes& Price(1987) in Aydınoğlu & Krishna, 2019; Orús et al., 2017; Park, 2006) Peck Barger & Luangrath (2013).	Vividness (Aydınoğlu & Krishna, 2019; Park, 2006)	The image I got of the jumper is.. Unrealistic Lifelike Detailed Clear	.71
	Sensory Imagery (Orús et al., 2017) (Park, 2006)	I felt that I could... imagine the looks of the jumper examine the looks of the jumper visually explore the jumper imagine moving my fingers on the jumper examine the texture of the jumper imagine the feel of fabric textures (e.g., smooth/rough, flat/textured)	.87
	Ease of imagining	When I looked at the jumper... I imagined what it would be like to touch it. I felt as if the the jumper was in my hands to imagine how the jumper measures up to my expectations to picture myself wearing the jumper to fantasise about wearing the jumper	.85

		to picture myself enjoying the jumper	
	Nature of imagining	Positive-Negative Unpleasant-pleasant Fun-boring	.85
Immersive Experience Questionnaire IEQ(.91) 7 point Likert (Far below average- -Far above average)	Captivation	To what extent did... the content hold your attention you feel focused you put an effort into watching the content you feel motivated to keep on watching you enjoy the cinematography, graphics and/or imagery you enjoy watching the content Would you like to watch more of this, or similar content, in the future? (Definitely not -Not-Probably not -Might or might not-Probably yes -Yes -Definitely yes)	.91
	Transportation	To what extent did... you feel like you were in the store environment you feel like you were experiencing, rather than watching you feel like the experience of the product was similar to that in the store	.82
Need for touch (NFT) Peck and Childers (2003a) 12 items, six items for the instrumental dimension and six items about the autotelic dimension items. 7 point Likert (strongly disagree to strongly agree)	A = autotelic scale item; I= instrumental scale item.	When walking through stores, I can't help touching all kinds of products. (A) Touching products can be fun. (A) I place more trust in products that can be touched before purchase. (I) I feel more comfortable purchasing a product after physically examining it. (I) When browsing in stores, it is important for me to handle all kinds of products. (A) If I can't touch a product in the store, I am reluctant to purchase the product. (I) I like to touch products even if I have no intention of buying them. (A) I feel more confident making a purchase after touching a product. (I) When browsing in stores, I like to touch lots of products. (A) The only way to make sure a product is worth buying is to actually touch it. (I) There are many products that I would only buy if I could handle them before purchase. (I) I find myself touching all kinds of products in stores. (A)	.91

9.10. Study 2: Pearson correlations of the model factors

Correlations (N=206) for Pearson correlation

	NFT	ATT	CE	IMHPT	IMVIS	IM EASE	IM_NAT	IM_VIV	IE CAP	IE TRS	PI
NFT	1										
ATT	Ns.	1									
CE	.12*	.45**	1								
IMHPT	.20**	.25**	.29**	1							
IMVIS	.14*	.31**	.51**	.45**	1						
EASE	.14*	.57**	.40**	.48**	51**	1					
IM NAT	n.s	.42**	.47**	.45**	.47**	.56**	1				
IM VIV	.12*	.20**	.44**	.47**	.49**	.36**	.43**	1			
IE CAP	.11*	.48**	.54**	.47**	.44**	.58**	.53**	.32**	1		
IE TRS	n.s	.32**	.36**	.55**	.42**	.55**	.41**	.37**	.54**	1	
PI	n.s	.61**	.50**	.18**	.36**	.57**	.44**	.25**	.51**	.31**	1
PV	n.s	.42**	.48**	.37**	.39**	.40**	.54**	.45**	.40**	.32**	.34**

Note. NFT= need for touch, IM= imagery measures, PM: presentation method (condition), ATT= attitude, CE = channel evaluation, PV=product value, PI= purchase intention, n.s= not significant.
*. Correlation is significant at the 0.05 level (1-tailed).
**. Correlation is significant at the 0.01 level (1-tailed).

9.11. Study 2: Kruskal-Wallis Test result for Presentation method

Hypothesis Test Summary
Independent-Samples Kruskal-Wallis Test of presentation method

	Null Hypothesis	Sig.	Decision
1	The distribution of Attitude is the same across categories of CON_V1V2.	.65	Retain the null hypothesis.
2	The distribution of Evaluation is the same across categories of CON_V1V2.	.13	Retain the null hypothesis.
3	The distribution of Haptic Imagery is the same across categories of CON_V1V2.	.04	Reject the null hypothesis.
4	The distribution of Visual Imagery is the same across categories of CON_V1V2.	.01	Reject the null hypothesis.
5	The distribution of Nature is the same across categories of CON_V1V2.	.09	Retain the null hypothesis.
6	The distribution of Ease of Imagining is the same across categories of CON_V1V2.	.86	Retain the null hypothesis.
7	The distribution of Vividness is the same across categories of CON_V1V2.	.10	Retain the null hypothesis.
8	The distribution of Immersive Experience Captivation is the same across categories of CON_V1V2.	.56	Retain the null hypothesis.
9	The distribution of Immersive Experience Transportation is the same across categories of CON_V1V2.	.05	Reject the null hypothesis.
10	The distribution of Purchase Intention is the same across categories of CON_V1V2.	.41	Retain the null hypothesis.
11	The distribution of Product Value is the same across categories of CON_V1V2.	.01	Reject the null hypothesis.

9.12. Study 2: Kruskal-Wallis Test result for need for touch

Hypothesis Test Summary
Independent-Samples Kruskal-Wallis Test NFT

	Null Hypothesis	Sig.	Decision
1	The distribution of Attitude is the same across categories of Percentile Group of NFT Median Split.	.65	Retain the null hypothesis.
2	The distribution of Evaluation is the same across categories of Percentile Group of NFT Median Split.	.08	Retain the null hypothesis.
3	The distribution of Haptic Imagery is the same across categories of Percentile Group of NFT Median Split.	.00	Reject the null hypothesis.
4	The distribution of Visual Imagery is the same across categories of Percentile Group of NFT Median Split.	.04	Reject the null hypothesis.
5	The distribution of Nature is the same across categories of Percentile Group of NFT Median Split.	.25	Retain the null hypothesis.
6	The distribution of Ease of Imagining is the same across categories of Percentile Group of NFT Median Split.	.08	Retain the null hypothesis.
7	The distribution of Vividness is the same across categories of Percentile Group of NFT Median Split.	.11	Retain the null hypothesis.
8	The distribution of Immersive Experience Captivation is the same across categories of Percentile Group of NFT Median Split.	.16	Retain the null hypothesis.
9	The distribution of Immersive Experience Transportation is the same across categories of Percentile Group of NFT Median Split.	.58	Retain the null hypothesis.
10	The distribution of Purchase Intention is the same across categories of Percentile Group of NFT Median Split.	.30	Retain the null hypothesis.
11	The distribution of Product Value is the same across categories of Percentile Group of NFT Median Split.	.28	Retain the null hypothesis.