

# The role of tactile product descriptions in online retailing

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Master Thesis submitted in fulfilment of the Degree

Master of Science in Management

Submitted to Dr. Marion Garaus

Slavko Dasic

61904054

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## **AFFIDAVIT**

I hereby affirm that this Master's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

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## **ABSTRACT**

Among all industries, one of the characteristics of recent years is the growth of e-commerce. As the number of internet users continues to grow and more retailers transition to online platforms, marketers should pay attention to emerging trends and subsequently modify their market strategies. However, online retail can be a challenging environment in which to apply known marketing techniques, especially techniques based on sensory marketing. Some of the previous research shows that consumers rather purchase so-called material products (that require touching for better perception) like clothing and fashion in classic retailing stores. The changing retail landscape and the associated trend of online retail increase the importance of compensating for the lack of a sense of touch in an online environment. Therefore, it is essential to investigate if there are any compensation methods for a sense of touch.

The overall objective of this research was to gain a deeper understanding of the product description effect on the consumer's purchase decision in an online retail environment. Therefore, exploring tactile product description and the effect of this kind of description on consumers' haptic imaging of the product was of great importance. Finally, in addition, another research focus was the purchase decision and the positive influence of haptic imaging on the purchase decision.

To assess and ascertain the answer to the research question and to get closer to the objective of the current thesis, an online experiment has been conducted on a sample of recent online shoppers. The research framework of the study measures constructs such as quality of product information, perceived haptic imagery, and purchase intention.

The current research contributes to the existing literature by confirming some of the previous research that has focused on product or service descriptions in different industries; and, in addition, the findings extend to the implementation of sensory marketing strategies in the online clothes retail sector.

Finally, one of the most important findings of this study is the significance of haptic signals in the purchasing experience. This study shows that information in the description about how the product feels elicits and stimulates higher degrees of haptic imagery. The research indicates that evoked haptic imagery eventually impacts purchasing intentions via perceived haptic imagery.

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## **LIST OF ABBREVIATIONS**

HI – Haptic Imagery

NFT – Need for Touch



# 1 INTRODUCTION

## 1.1 Context and previous research

In recent years, e-commerce has become an essential component of the global retail landscape (Chevalier, 2022; Coppola, 2022). The retail sector, like many other enterprises, has experienced significant development since the birth of the internet, and because of the continuous digitization of modern life, customers from practically every country may now be engaged with digital enterprise and practice online purchases. As internet availability and use continue to grow quickly across the world, the number of digital purchasers also increases year after year (Degenhard, 2021). Over two billion individuals purchased products or services online in 2020, while global e-commerce sales topped 4.2 trillion US dollars in that same year (Coppola, 2022). In June 2020, retail websites recorded a stunning 22 billion visitors, an increase of almost 6 billion from 16.07 billion worldwide visits in January 2020 (Clement, 2021). While the purchase of goods and services online has become a common practice around the world and the number of digital buyers is constantly growing, this sharp increase from January to June 2020 can be attributed in part to the global coronavirus pandemic, which prompted millions of people to stay at home in order to prevent the virus from spreading. According to projections, the online market will continue to grow, and by the year 2025, it will account for about a quarter of total worldwide retail sales (Coppola, 2022). Some choose to make online purchases for convenience (Maat & Konings, 2018), others because of the competitive price offered by some e-commerce platforms (Gligorijevic, 2011; Maat & Konings, 2018).

In addition to consumer behaviour, business behaviour must also be taken into account. Businesses operate in fast-paced marketplaces and must be up to date with globalization trends while adapting to frequent changes in customer behaviour, especially in an online environment (Dumitrescu et al., 2015). Therefore, recent research about consumer behaviour in online environments focuses on new factors and disciplines such as psychological perspectives including individual preferences, emotions, and sensory experiences (Martinez-Ruiz & Moser, 2019). According to Aw et al. (2021), a greater number of consumers explore products and gather information about products in the online environment than in traditional brick-and-mortar stores. However, when it comes to the final purchase process, most consumers return to traditional brick-and-mortar stores mainly because of the lack of a sense of touch in the online environment. The importance of the sense of touch has been defined since the earliest ages of history. Aristotle's theory of *aisthēsis* (sense perception), from the 4<sup>th</sup> century BC, suggests that the hierarchical organization of five senses is possible and that the sense of touch is the most powerful sense and therefore claims the top of the hierarchy. Per Aristotle, touch provides a true picture of the fundamental nature of the object. It is also the first sense to develop and the last sense one loses with age (Krishna, 2011). What can a person do if he or she wants to know

and understand more about an object or a person, or if he or she wants to determine if something is genuine? According to Gallace & Spence (2014), individuals touch to “explain” the real facts, confirm doubts, and either comply or don’t comply with the imagination. The process of touch happens in a particular order: physical (where the contact occurs), relational (where exchange of information occurs), and introspective (where feeling or effect occurs) (Racat & Capelli, 2020). Therefore, touch is a physical link with the outside world and the aforementioned procedures are used to explore and better comprehend the world in conjunction with the other four senses. Because touch relies in part on physical information, these processes are very limited in online environments. According to Hultén et al. (2009), material, surface, temperature, weight, form, and steadiness are the characteristics that evoke touch sense reactions. All of these characteristics are important and can be explored with the sense of touch to gain additional information about an object. The changing retailing landscape and the associated trend of online retailing increase the importance of the lack of the sense of touch compensation in an online environment. As a possible solution for overcoming the obstacle of the lack of a sense of touch, Hultén (2020) gives an example of a system of purchase with various return policies where consumers can make the purchase online freely, test the product in a more relaxed home environment after the delivery, and if not satisfied, return the product to the sender. However, various return policies, may also incentivize excessive ordering and lead to increased return rates, which has negative implications for managing the ecological and sustainability issues associated with online retail (Frei et al., 2022). Product returns are more common when purchasing online and it is estimated that returns from internet purchases are twice to three times the amount of those from physical shop returns. The inefficiency and volume of returns can easily account for more than 30% of the carbon emissions from the initial first delivery (Tian & Sarkis, 2022). Sustainability factors are rarely considered in return procedures, and products may end up in recycling or waste, particularly for items under a certain monetary value, which often cost more to process than the company could generate in income if returned to market (Frei et al., 2022). Another related issue is that the quality and quantity of returned items are unpredictable (Kuik et al., 2011). In order to reduce the ecological impacts of online shopping, it is important to consider strategies for overcoming the lack of haptic information in the online channel, which may include giving autotelic information about the product, such as a description of the texture, and improving the online channel purchasing experience. Providing online communications focusing on the physical elements of the product, such as size, form, material, or colour may compensate for the lack of physical product accessibility for consumers with high NFT in its instrumental dimension (Manzano et al., 2016b).

Abhishek et al. (2014) confirm that, in a retail environment, people like to touch products regardless of the product’s texture or the recognizability of the brand. Price also does not determine whether the product is desirable to touch or not. A test conducted by Peck & Childers (2003b) confirms that the possibility of contact between a consumer and a product can also provide the consumer with a more personal experience and therefore greater consumer

satisfaction. In addition, research by Jha et al. (2019) suggests that it is more important for consumers to have the chance to explore the product in traditional brick-and-mortar retail stores than merely viewing the product online. In the same vein, the possibility of touching a product has a psychological effect and creates a sense of perceived ownership that can have a positive influence on purchasing decisions (Peck et al., 2013). Touch also provides an emotional experience that no other stimuli can compensate for (Abhishek et al., 2014). Therefore, in most cases, consumers prefer to purchase products with haptic characteristics – including the main focus of this thesis, clothes – in traditional brick-and-mortar retail stores instead of via online retail platforms. A possible explanation for this preference is that consumers can touch the products and, in that way, “feel” the product before purchasing it (Hultén, 2020).

Responses to a survey conducted by Maat & Konings (2018) show that respondents' reasoning for shopping online included greater variety, better price, and convenience while shopping. The research of Dumitrescu et al. (2015) suggests that there is no significant difference in consumer behaviour between the two channels, except that consumer purchasing behaviour is more complex via online channels because consumers have access to more information about the products on online platforms. Kotler & Armstrong (2017) show that the “search for the information” and “evaluating the options” are the two most important factors for consumers while shopping. It may be assumed that the sense of touch greatly factors into the aforementioned activities. However, a study by Xu et al. (2020) notes that despite the lack of haptic input, online shopping may become the more dominant mode of shopping in the future since consumers are more likely to spend e-money, which is not going directly from the hand of the consumer to the hand of the seller, as opposed to real money transactions. Therefore, future research should focus more extensively on the area of online retail.

The sense of touch very rarely happens alone and usually works in collaboration with the senses of sight, smell, sound, and taste (Grabowecky et al., 2011, Hultén et al., 2009). The full perception of a product through the sense of touch can also depend on the presence of other senses in the consumer's interaction with the product. Often vision and touch work together to help people gain a full understanding of an object (Hultén et al., 2009, Racat & Capelli, 2020). Therefore, marketers in sensory marketing can provide a better overall shopping experience and make a purchasing decision easier by addressing the consumers' senses (Hultén et al., 2009). However, in online retail, there is a lack of the sense of touch as a starting point in some of the sensory marketing practices, so current research is focusing on possible solutions to this deficiency. One possible solution, proposed by Peck & Childers (2003b), suggests that, taken together, visual sensory stimulation and written description can partly improve the information the consumer receives if they are getting little to no information through touch. They state that additional visual information or written description about the haptic characteristics of products can improve the consumer's perception of the product when they lack the ability to investigate the product through touch. Similarly, McCabe & Nowlis (2003) found that in the online environment,

consumers greatly preferred descriptions of haptic properties to visual properties. The relevance of product descriptions is supported by Mitchell & Olson's 1981 study that showed that an advertisement with a verbal description ("soft") and an advertisement with a picture of a kitten prompted participants to view the product as softer than products whose campaigns used other sorts of visual imagery. In the same vein, Lv et al. (2020) argue that haptic cues, or the descriptive information offered in online reviews, have a substantial impact on customers' desire to make a hotel room reservation online. The authors state that the haptic signals, whether they be verbal or visual, may influence the customer to book via the online system and that tactile information is a significant deciding factor, even when direct tactile sensation is unavailable.

To consider another example from a different sector, online written product descriptions also play an important role in the food sector, especially in relation to "mouthfeel" (Guinard & Mazzucchelli, 1996). Spence et al. (2013) note that the textural features of a dish or a drink can help individuals determine what they find appealing about certain foods, and how they decide on a favorite one. These textural features should be taken into significant consideration when creating the written descriptions for food and drinks. Fox et al. (2022) also conducted research about mouthfeel in the beer industry as an important factor for consumers deciding their preference regarding beer type. Considering the food and beverage industry more generally, crispness, crunchiness, softness, juiciness, and firmness are some of the most desired textural cues. According to Guinard & Mazzucchelli (1996), these characteristics could lead consumers in the purchase decision-making process. Interestingly, some authors also argue that the name of the dish gives a good indication of what to expect from the flavour, as even adding a simple "tasty" in front of the food name may make a difference and entice a customer to buy a specific product (Wansink et al., 2005). While the food and beverage sector is not the main focus of this thesis, understanding how sensory descriptions are used in this sector may help elevate sensory marketing in other sectors.

Because haptic devices are still in the development phase and are not widely available on the general market, (See et al., 2022), alternatives to compensate for the lack of the sense of touch in the online retail environment have to be examined. In addition, further research should be conducted regarding how consumers can be stimulated to experience touch without using the receptors in their skin or if that is even possible (Gallace & Spence, 2014). The growing trend of internet users in recent years (Degenhard, 2021), as well as e-commerce sales (Chevalier, 2022), and consumers' preference of spending e-money as opposed to real money, as it is not going directly from the hand of the consumer to the seller (Xu et al., 2020), keep the focus of this thesis on addressing the gap in sensory marketing in the online retail industry. More specifically, this thesis will focus on the clothes sector of the online retail industry.

## 1.2 Research aims and objectives

It would be of great interest to find out if consumers' tactile product descriptions prompt feelings which are similar to feelings experienced during touching a product. Many researchers cover the importance of a sense of touch in classic physical stores (Abhishek et al., 2014, Hultén, 2020, Jha et al., 2019, Peck & Childers, 2003b). However, the trend of increasing online retailing practices indicates the need for more practical actions of sensory marketing in an online environment (Chevalier, 2022, Dumitrescu et al., 2015, Martinez-Ruiz & Moser, 2019). Therefore, it is important to investigate if there are any compensation methods for a sense of touch. The current thesis will explore the consumer experiences that are a result of sensory marketing strategies in online retailing. More specifically, the current thesis will explore the effects that haptic product descriptions (e.g., soft, light, rough, warm, etc.) have on consumers when making purchase decisions and consumers' perception of the product in an online environment. The current thesis will therefore answer the question

*To what extent do consumers rely on haptic information, when provided in the product description, during the online purchasing process ?*

In addition, the thesis will reveal if consumers with tactile product descriptions have a better understanding of the product regarding the product's quality and a better perception of a product overall in online environments. Furthermore, the analysis of consumers' purchase decisions in stated conditions will be conducted. This thesis will further provide possible solutions and potential compensation for the lack of sense of touch in online shopping environments.

## 1.3 Thesis structure

The following paragraph provides a description of the structure of the thesis, which consists of five main chapters. After the initial introduction of the topic and research aims of the thesis, the literature review section will give closer insights into the essential topics essential for the current thesis. These are sensory marketing with subtopics related to the sense of touch and the topic of online retailing with subtopics on consumer behaviour and product descriptions.

The methodology chapter will explain the study design, research model, and different components that will help in answering the research question. Furthermore, the chapter will provide a closer look into an online experiment and data collection methods, and analysis procedures of the data.

The final chapter discusses the findings yielded by the online experiment. In addition, the author will provide an answer to the research question and the possible limitations of the study will be outlined. This chapter will further summarize the findings and develop managerial implications.



## 2 THEORETICAL FRAMEWORK

### 2.1 Sensory marketing

The discipline of marketing is continuously evolving, reflecting the influences of a variety of environmental marketing factors, such as economic, competitive, and technological influences (Brunswick, 2014). Because the field is constantly evolving, the definition of marketing also continues to evolve. However, Kotler et al.'s (2018) definition of "marketing" provides an excellent starting point. He defines "marketing" as the company's actions toward consumer engagement while building strong consumer relations with the company and product to create a relationship that is precious for consumers. According to the same author, the purpose of marketing is to be able to get something valuable from consumers in return and turn it into profits. Based on this definition, it is now possible to define what sensory marketing is and how it works. Various authors define sensory marketing as marketing that addresses consumers' senses and influences consumers' feelings, judgments, behaviours, and perceptions (Değermen Erenkol, 2015; Krishna, 2011). Sensory marketing must continuously adapt to a variety of factors in order to address these emotional and sensorial aspects and effectively reach the consumer and influence their reactions and buying habits (Hultén et al., 2009).

One of the pioneers in sensory marketing research, Hultén (2020), states that sensory marketing processes are of great value for businesses who are seeking to enrich their business practices. A possible explanation for this notion is that consumers can better perceive both the overall brand and the brand's individual products, objects, and services through multi-sensory brand experiences. Similarly, Krishna et al. (2016) assert that sensory marketing is of great value for businesses since sensory cues can evoke emotions and encourage consumers to spend money. In the same vein, Hultén (2020) expands the definition of sensory marketing to cover all marketing strategies that can provide sensory cues or stimuli to any individual consumer. However, the same author argues that sensory marketing may lead to consumers having experiences with the product that may be opposite of the goals of the marketing strategy.

In a different study, Hultén et al. (2009) demonstrate that of all five senses - sight, smell, sound, taste, and touch – the sight was the main target in marketing practices until recently. Now, new practices in marketing require addressing all five senses to achieve the best result of bringing the consumer close to the product and thereby motivating the final purchase (Jiménez-Marín et al., 2019). Addressing all five senses is now considered to be the best practice for swaying consumers' opinions and spurring their actions (Hultén, 2020). Hultén also suggests that if this is not feasible, a combination of as many senses as possible might be more appealing to customers and keep them devoted to a product or service, rather than relying on visual stimuli alone. Further chapters of this thesis will cover psychological reactions to sensory stimuli. Moreover, Shabgou & Daryani (2014) suggest that organizations can engage consumers' senses

and attract more customers to their products by integrating sensory expressions in their products and adopting sensory marketing methods. According to these authors, human senses play an important part in the shopping experience, and by strategically stimulating these senses, customers' purchasing behaviours may be impacted. Sensory marketing places the human brain and its five senses at the heart of marketing, demonstrating that organizations and merchants may have a positive influence on the consumer's five senses through various stimuli such as colour, smell, sound, taste, and texture. For example, music is one such stimulant that could influence consumer behaviour. Gaygen (2013) stages a study that investigates causal connections between music and simulated buying behaviour. The results indicate that exposure to music shortens the time a consumer spends viewing a product and therefore inhibits buying decisions. The findings also show a linear association between response time and purchase decisions, with shorter viewing periods resulting in fewer purchases and longer viewing periods resulting in more purchases. Choosing not to buy anything appears to be the default, intuitive, quick, and instinctive option, whereas purchasing something tends to require longer periods of time and more conscious cognitive effort (Gaygen, 2013). In a similar study, Santos & Freire (2013) demonstrate the influence of music on consumers' purchase decisions and their stay at the point of sale. After analysing several studies, Santos & Freire (2013) argue that when music appears familiar to the customer, it produces greater favourable responses in terms of purchase intention. Another key aspect is that when consumers are differentiated by gender, they are influenced differently. Women tend to be more sensitive to slower music, as it is more likely to influence female emotions and lead them in their purchasing decisions than it is to influence male emotions and purchasing decisions (Santos & Freire, 2013). Similarly, Biswas et al. (2019) investigate managerial ease of adjusting volume levels at stores/restaurants and the influence this has on patrons' food choices and retail sales. Interestingly, two field tests and five lab investigations suggest that low, as opposed to high or no, level music/noise leads to more sales of healthy meals due to increased patron relaxation. High-volume music/noise, on the other hand, tends to increase tension, which leads to unhealthy eating choices. However, more findings from Biswas et al. (2019) imply that music volume may have unexpected implications regarding customer product selections. They tested consumers' meal selections and sales by varying the levels of ambient music and background noise at a restaurant. According to this study, low, as opposed to high or no, volume music/noise increased sales of healthier goods because of the calming or relaxed atmosphere. High volume music/noise tended to increase enthusiasm, which leads to unhealthy food choices, while no music and/or background noise led to anxiety and tension. The results of this study indicate that sensory stimuli must be carefully considered and implemented, as extremes of any stimuli may lead to negative outcomes.

Similarly, audio and visual elements affect customer approach and touch behaviour in a retail context (Hultén, 2013). The findings guide retail managers in using sensory cues in retail stores in connection to the human senses to create an attractive, appealing retail environment, and

design successful sensory experiences at the point of purchase. The aim of such stimuli is to create a positive impact on purchase behaviour. In this study, Hultén used a multi-sensory brand experience to trigger an interaction between the senses of sight and touch. In addition, Abdolmohamad Sagha & Akbari (2022) demonstrate that the sensory cues used by customers to sense the environment, as well as the harmony between the sensory stimuli of the products, impact consumers' emotions, intentions to purchase, and satisfaction. More concretely, the authors argue that when the product and surrounding colours are very inconsistent, the emotions of the consumers are heightened, resulting in a stronger sensory and emotional experience and a greater desire to pay for the goods. When the product and background colour are congruent, the emotions, experience, and consumers' desire to pay for the product are reduced. In addition, the work of Farias et al. (2014) demonstrates that smell or olfactory stimulus influences consumer behaviour and desire to pay for the products. According to this study, the scent of a specific object or/and the fragrance of the area itself both significantly affect consumer behaviour, specifically consumers' intentions to purchase an item. Smells that are emitted by items or goods are frequently a signal to the customer of the quality of the objects and therefore consumers level positive or negative evaluations on these products, those in which scent is a valuable factor, such as fragrances, food, drinks, and cleaning house products. Farias et al., (2014) also argue that technology enables the use of artificial aromas to impact reactions to any product offered in a brick-and-mortar retail store.

Taken together, sensory stimuli applied for the purposes of sensory marketing greatly improve the consumer experience and increase the likelihood that a consumer will purchase a given item. Experience is a combination of internal responses including sensations, feelings, cognitions, and behavioural responses that occur from interaction with brand-related stimuli (Brakus et al., 2009, Hultén, 2020). In addition, sensory marketing provides more personal relations with the consumer than other marketing strategies, as it has to be provocative and different from previous mass or relationship-based marketing practices (Hultén, 2009). One explanation for the positive effect of sensory marketing is its potential to prompt emotions within consumers and promote the product as an experience rather than merely its purely functional attributes (Hultén, 2020). Addressing the five senses by sending sensory information to consumers' minds and bodies may heighten consumers' experiences because sensory experiences generate improved perception and feeling (Hultén, 2020). For example, a company or marketing agency can set the goal of curating consumers' experiences so that they will engage more with the product and gain a better understanding of a product or service. Similarly, research by Moreira (2017) shows that involving the human senses can motivate consumers to purchase products and services and improve the customers' overall experiences, thereby encouraging brand loyalty. A consumer's perceptions of and experiences with a brand then help the consumer to define the worth of a brand and set a value for a brand or product. This view is supported by Pine & Gilmore (2011), who suggest that consumers' perceived value of a company is generated mainly by a consumer's experience with said company. Any type of sensory experience Sensory

experiences can be the result of an interaction with the product or within the service environment, as well as from the procedures from which the goods and/or services are derived. For example, sensory experience may occur during the purchasing process or even during the later use of the product or service. Ultimately, the aim of sensory marketing is to engage the individual consumer throughout the product's complete life cycle (Pine & Gilmore, 2011). However, the multi-sensory experience is a deeply individualized process, since not all individuals perceive the same sight, sound, smell, taste, or touch (Brakus et al., 2009). Therefore, an important aspect to consider when implementing sensory marketing strategies is to ensure that each consumer can shape their own experiences when engaging with the product and/or service.

From a managerial perspective, sensory marketing is a great tool to activate cues that define consumers' perceptions of product quality (Krishna, 2011). The most important part of sensory marketing for marketers to understand is how and where to use the sensory cues and be able to predict consumers' possible perceptions and reactions, since their responses can influence their purchase intentions. Tactile marketing is an important facet of sensory marketing; this is the process of consumers and brands engaging through physical and mental interactions (Pollák et al., 2021). The goal of tactile marketing is to provide the consumers with a better perception of the brand so that they are left with a positive impression and memory of the product. It is assumed that unconscious triggers, like ones connected to the five basic senses, have more success in reaching the consumer and are more likely to produce the desired outcomes (Krishna, 2011). In addition, these unconscious triggers may have better success in encouraging the consumer to purchase the product or service, as this is a more individualized experience, as opposed to verbal triggers or encouragement from a salesperson, which could be too forceful and ultimately drive the consumer away. The importance of purchase intention when implementing marketing strategies is supported by Pollák et al. (2021), who note that sensory marketing should consider not only the stimulation of the five senses but also the effects of sensory marketing strategies on consumers' shopping behaviour. The most intriguing aspect of consumer purchasing behaviour to investigate is the extent to which sensory marketing influences the consumer's purchase decision. The most desirable achievement of sensory marketing is when it works in the favour of the initiator and encourages the consumer to make a purchase (Hultén, 2020). In the subsequent sections, the thesis concentrates on tactile marketing, the role of the sense of touch in tactile marketing strategies, and consumer behaviours in online retail environments.

Based on the definition of sensory marketing and the research regarding consumers' reactions to sensory marketing, it can be concluded that the stimulation of the senses has an impact on consumers' feelings, judgments, and perceptions of a product or service, which can then influence a consumer's decision-making process. Individuals rely on the five senses in daily life to better know the world around them (Hultén, 2009), and trust their senses to guide them

through various situations and aid them in the decision-making process (Pollák et al., 2021). By implementing sensory marketing strategies, businesses may be able to stimulate better or more positive consumer perceptions of products, services, and processes (Pollák et al., 2021; Hultén, 2009; Hultén, 2020). Therefore, one of the focuses of this thesis will be on the consumer experiences that result from sensory marketing strategies.

### **2.1.1 Sence of touch**

Aristotle's theory of *aisthēsis* (sense perception), from the 4<sup>th</sup> century BC suggests that the hierarchical organization of five senses is possible and that the sense of touch is on top as the most powerful one. Per Aristotle, touch provided a true picture of the real nature of the object. It is also the first sense to develop and the last sense one loses with age (Krishna, 2011). He also proposed that all other senses help in increasing the sensitivity of touch sensation. Individuals even start to feel and react to touch before he or she is born (Krishna, 2011). One of the most famous studies about touch revealed how important touch is and how living beings react to it (Harlow, 1958). The research compared a mother's touch and a nutrient to explore what baby monkeys prefer more. The evidence from the experiment with infant macaque monkeys suggests that monkeys preferred to stay near the "mother" made of soft clothes rather than staying near the "mother" made of just wires. Another difference between the two "mothers" was that the cloth mother had a 100 W light bulb behind the cloth providing warmth, and the wire mother was providing the milk. The warmth and softness were this time more attractive and desirable than basic nutrition for life.

According to Gallace & Spence (2014), individuals touch to "explain" the real facts, confirm doubts, comply, or not comply with the imagination. The authors state that touch is then the sense one trusts the most and one believes that no one can fool his or her sense of touch. In the work of Racat & Capelli (2020), several definitions can help in a better understanding of touch. One of the examples is the "touch" in the sense that uses skin physical contact for the perception of objects by using pressure and for example, detecting the temperature. The authors argue that the process of touch happens in particular order: physical (where the contact occurs), relational (where exchange of information occurs), and introspective (where feeling or effect occurs). Touch is assumed as a link with the outside world to better explore and comprehend it by doing the aforementioned procedures in conjunction with the five other senses. Racat & Capelli (2020) also distinguish between active and passive touch. For example, when a person picks up the product to smell it, a person uses active and passive touch together. The first objective of the person is to use the sense of smell on the product, however, when the product is picked up its weight, texture, and temperature are recognized and perceived. The sense of touch comes from a passive state and the person is receiving the information passively (Racat & Capelli, 2020). In a conclusion, both passive and active touch keeps one up to date with the outside world no matter if individual touches consciously or not. Hultén et al. (2009) support this view by arguing that physical contact with the object is crucial in exploring the true nature of the object. Another

important fact comes from the work of Racat & Capelli (2020) who concludes that touch gives information without pauses or breaks, meaning that individuals cannot ignore this sense. On the contrary, one example of a sense that may be temporarily ignored is vision, which can be accomplished by closing the eyes. The situation can be the same with other senses, even the taste by holding the nose. Therefore, the sense of touch works 24 hours and it is constantly helping in forming perception and understanding. Even while sleeping tactile sense is to some extent active allowing individuals to perceive touch itself, discomfort, or temperature (Velluti, 1997).

One of the main “tools” of sense of touch in “explaining” the facts about the objects is hands. The hands are one part of a body that is highly rich in receptors and only a little finger can provide more information to the brain cells than the whole back (Hultén et al., 2009). Therefore, because of the high sensibility of hands individuals can use their hands for connection with the outside world mainly by exploring the textures and other characteristics of the objects. Not only the hands but also the whole surface of the human body is equipped with the receptors that enable a person to sense the sense of touch (Montagu, 1986). The author states that vision is also one of the important senses for humans, however, the human skin is the largest organ of senses and the oldest sense that developed.

One of the main questions is if everyone does have the same need for contact or touch? One of the popular researchers on haptic information processing (Peck & Childers, 2003a) developed the *Need for touch scale* (NFT) to answer the previous question. The research explains that there are individual differences regarding the need for touch. The need for a touch scale is made of two subscales – instrumental and autotelic. Instrumental need for touch refers to a need for touch for some specific goal, such as for purchase decision-making for example. In the case of instrumental touch, there should be a function for making a touch. A little closer explanation of this kind of touch is a process where the individual is checking that the product is worth buying by touching. On the other hand, autotelic touch is when an individual is touching because it is fun and it involves more emotions than the previous one. Furthermore, there are also differences in touch between the products, touch between the humans, and touch between products and humans (Krishna, 2011). For this thesis, the most interesting one is the human touch on products and the situation in online retailing. More specifically, more and more money are spent on online retailing where consumers cannot touch the item and it would be interesting to see how people react and perceive the product in this environment (Chevalier, 2022).

Besides the two dimensions of NFT, intrinsic reasons can also motivate the need to investigate items haptically since some consumers are problem solvers, while others seek pleasure, imagination, excitement, sensory stimulation, and delight (Peck & Wiggins, 2006). Instrumental touch-oriented consumers focus on the information acquired from the product's physical features, as well as the confidence and assurance obtained through touch, whether referring to geometric variables such as size or shape, or material attributes like as texture, hardness,

weight, or warmth (Klatzky et al, 1993). According to Young (2019) instrumental online stimuli, such as product images and descriptions had a considerable influence on customer satisfaction for high NFT groups. Because pre-purchase touch is important for both high autotelic and instrumental NFT groups, they are more likely to pay attention to product information to compensate for an absence of touch when shopping for clothing online. This implies that for online customers with low NFT, only non-haptic webpage signals such as background color are essential because touch is not important to them. In addition, individual differences in NFT may have a stronger influence on online buyers' information-seeking behaviour and, as a result, their purchase choice since, as research by Young (2019) suggests, tactile information is crucial for garments goods. Similarly, findings by Manzano et al. (2016b) imply that in the clothing category, a lack of haptic signals remains an issue at the purchase stage for respondents who require touch solely for pleasure (high autotelic) as well as those for whom touch offers a source of information (high instrumental). However, it does not appear to be an issue during the search stage for high instrumental customers, since they may have simple and convenient access to product characteristics information 24 hours a day, seven days a week (Manzano et al., 2016b).

Moreover, consumers can be characterized both on an overall level (high/low NFT) and for each of the characteristics, i.e., autotelic or instrumental, using the NFT concept (Manzano et al. (2016b). Consumers with a high NFT score utilize touch as a technique of acquiring information differently from those with a low NFT score and have a better ability to retrieve haptic information. In addition, consumers with high NFT have a faster recall for tactile elements and employ touch early in the product evaluation process. Similarly, if consumers have direct access to the product, high levels of NFT influence their impression of it, resulting in higher confidence and less frustration. The amount of NFT a person has an impact on things like speed of access to tactile information and processing ability (Manzano et al., 2016b, Peck & Childers, 2003a). Consumers with a high NFT level can retrieve haptic data more effectively and have a better memory for tactile products. Similar to the results of many different authors, Citrin et al. (2003) findings show that consumers with a higher need for touch, especially instrumental ones, find themselves better in an environment where touch is possible rather than in a no-touching environment. Affective response when touching a product is a characteristic of consumers with an autotelic need for touch. Therefore, in an online environment, it is difficult to sell the product to consumers that are high in autotelic need for touch (Jha et al., 2019).

High levels of NFT lead to a decrease in the use of the Internet as a purchasing channel, particularly for things that require quality to be evaluated using touch rather than just having visual access to the product (Citrin et al., 2003). According to Manzano et al., (2016a) lower NFT values were discovered in customers who utilized the Internet as an exclusive channel, either during the search phase or during the purchase phase. Consumers who used the Internet in their search but completed their purchase in a physical store had a higher NFT level. Individuals with

a low NFT in both autotelic and instrumental dimensions are considered to fit the profile of the Internet user with a sense of touch.

Strategies for overcoming the lack of haptic information in the online channel may also include giving autotelic information about the product (softness information for example) and improving the online channel purchasing experience. Performing online communications focusing on physical elements of the product, such as size, form, material, or color may compensate for the lack of product accessibility for consumers with high NFT in its instrumental dimension Manzano et al. (2016b). These online communications together with actions taken on brand attributes may compensate for the lack of touch in the online medium and may serve as compensation for the NFT in its instrumental dimension. The described process may integrate NFT into the search phase, and then into the purchase phase of the product in an online environment (Manzano et al., 2016a).

Another significant aspect of NFT is given by Hultén (2020) and shows that individuals with a high need for touch (NFT) have a bigger desire for touch, especially when it comes to product evaluation and decision-making. On the contrary, for individuals with lower NFT simple images can be very useful when it comes to perception and possible decision-making influence processes. In the same vein, the classification of kinds of products regarding the NFT of the individuals is also possible (Abhishek et al., 2014). Authors of the research state that in one group there are products like clothes, cell phones, soft toys, linens, and apples representing the group with the highest need for touch. The next group is just a little lower in terms of NFT and consists of cushions, oranges, rugs, and digital cameras. In the last group, with the lowest need for touch, one can find glassware, electric appliances (house products), and different kind of house and working place gadgets. In addition, Abhishek et al., (2014) confirm that people like to touch the products regardless of hard or soft product, or famous or not that famous brand. Price also does not determine if the product is desirable to touch or not. It can be assumed that differences regarding the desire to touch are only regarding the individual interest in touch. In addition, research confirms that the visual stimuli enrich tactile stimuli and engage the consumer to explore texture, temperature, and weight (Abhishek et al., 2014). Similarly, research by McCabe & Nowlis (2003) confirms that in classic retailing the visual effect makes the first impression on the consumer, that later can lead to a greater desire for touch and exploring of the product, especially with the clothes and accessories. So far, there is not much evidence of how this process can function in the online environment where the final step of touching is not possible.

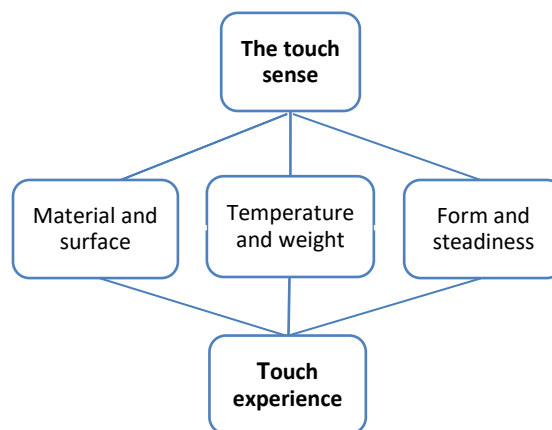
As a part of previously described sensory marketing, tactile marketing is the one that covers touch. NFT can also help in defining why some products are more difficult to sell if they cannot be analyzed through touch, as is the case in online retailing, in comparison with traditional retailing where the consumer can use touch and inspect the products. Individuals with a higher need for touch as expected are rarely the ones who shop online since their desire for touch to evaluate the product properly is high (Gallace and Spence, 2014). High instrumental need for



touch can be satisfied only through real touch and there is no real compensation for it in any other way. People who touch the product for the aspect that is more emotional and who touch the product because of the enjoyment are focusing more on the sensory itself than the meaning or function of it. The possibility of contact between the product and a consumer can also provide a more personal experience and therefore bigger satisfaction. The results of a test conducted by Peck & Childers (2003b) confirm on earlier mentioned statements about the need for touch. This test covers 199 individuals who were evaluating a sweater and a cell phone. Half of the participants were able to touch the products and the other half were only able to see the products behind the Plexiglas, without any possibility to touch them. When they were able to touch the products, high NFT individuals were feeling positive and relaxed considering that they were fulfilling their needs. On the other hand, for individuals with lower NFT, there was no big difference between the two cases. However, an important point about this experiment is that a written description of the product, in a case when not being able to touch and with high NFT, to some extent helped with frustration and product evaluation of the individuals. In addition, Peck & Childers (2003b) state that this was the case with cell phones where numbers in the description of the product were representing the weight, but not with the softness of the sweater. The current thesis will further examine the situation in an online environment with a high focus on product descriptions that may, or may not compensate for the lack of sense of touch.

### 2.1.2 Different factors that affect the touch

Figure 1 shows many characteristics that evoke touch sense reactions (Hultén et al., 2009). These characteristics are believed to further shape the touching experience.



**Figure 1.** Sense expressions and touch experience

*Note.* Adapted from Hultén et al. (2009, p.139)

Hultén et al. (2009) in their book provide a detailed explanation of each of the components. Material is an extremely important part as it can symbolize the whole brand in the interaction

with the consumers. Often used natural materials such as wood and leather are the symbol of something soft and warm and can help the consumer to be in a better connection with nature. In addition, people tend to be more relaxed around wooden materials. On the contrary, non-natural materials such as glass and metal represent something cold and hard. To some extent, it is comparable to the situations when an individual is analyzing other people's outfits and making judgments in advance. Unappealing material to one person may cause that same person to assess the brand or product made of particular material negatively, regardless of its functionality (Hultén et al., 2009). For example, leather represents warmth and softness but some individuals do not prefer wearing the leather material outfit, no matter of function, for many reasons. Similarly, Karana & van Kesteren (2008) argue that while describing the materials of products, individuals do not only focus on the physical characteristics of materials but also on non-physical ones, such as the sensorial and perceptive characteristics of materials. In the same vein, Bertheaux et al. (2020) in their work investigate the emotion evoked by different material touches using a methodology based on a blind assessment of numerous stimuli. A questionnaire that collects positivity and intensity of emotions, and measurements of autonomic nervous system activity, such as equipment for pupil size measuring evaluates the human emotional reaction to the material. The test on the participants repeats after each contact with different materials. The findings reveal that pupil size changes in response to emotional intensity. It is substantially more when touching objects regarded as pleasant (soft velvet and artificial fur) or unpleasant (different sandpapers) than when touching neutral materials. Further, Abdolmohamad Sagha & Akbari (2022) confirm that higher consumer emotions can result in a better experience and a stronger desire to pay for the goods.

To assess the roughness of a surface an assumption is that an individual's natural response would be to rub the surface, and to assess the hardness of that same subject, to apply some pressure on it (Lederman & Klatzky, 1987). According to these authors, substance-related properties of the object may be texture, hardness, temperature, and weight. To access these properties individuals may use lateral motion, pressure, static contact, and unsupported holding. The lateral motion manifests sideways movement between skin and object surface. The pressure comes from applying forces to one part of the object and the static contact occurs when one hand passively rests on the object without holding it (Lederman & Klatzky, 1987). To access the weight of an object individual lifts the object away from any supporting surface and maintains it in the hand. Roughness descriptions come in several ways, all of which are dependent on the amount of height variation on the surface of an object or material. It is possible that the feeling of roughness extends beyond physical roughness to encompass other physical elements such as friction (Tiest & Kappers, 2007). These authors argue that roughness is a haptic perception, however, the visual state enhances the material and its roughness recognition as well, as previously experienced haptically in life and recovered from memory. In addition to tactile information from memories, the work of Hutmacher & Kuhbandner (2018) demonstrates that the hand-feel qualities of a product stay in memory for one week after only

ten seconds of exposure to it. In findings by Tiest & Kappers (2007), the correlation between haptic and visual perception is almost the same, with the fact that haptic exploration of the materials took longer. Work by Gueorguiev et al. (2016) continues in the same direction and demonstrates the importance of frictional cues when exploring materials. It also demonstrates that individuals can distinguish completely between flat surfaces on the sole basis of frictional cues. When compared to short information received from static interactions with materials, mechanical fluctuations caused by sliding fingers or other sensors provide extensive information about the underlying topography of a surface. These mechanical fluctuations may allow people to distinguish between surfaces that are physically similar but different in their molecular structure. In the two experiments Gueorguiev et al. (2016), challenged human volunteers to distinguish between flat surfaces made of glass and flat surfaces made of polymethyl methacrylate. Participants were facing three samples arranged in a single row where one of the three samples was always distinct from the other two. Participants could freely examine the samples as many times as they desired before reporting. Results show that participants were able to successfully make a distinction between the materials using frictional cues between fingers and the surface of the product. It may be assumed that the same technique could be valuable when performing shopping and making a purchase decision.

Furthermore, touching the product to feel the temperature or weight is another important part of the touching experience. It also complements the previous touching experience with the material. An individual usually distinguishes between cold and hot/warm. For example, when receiving in hands his choice of beverage from the coffee shop, like tea or coffee, one expects the cup to be hot or warm, in some cases cold but rarely. An individual knows what he or she is expecting and therefore engages the touch to test and confirm their expectations (Hultén et al., 2009). The skin's resting temperature is usually greater than the temperature of items in the surroundings (Hsin-Ni, 2018). When the hand comes into touch with an object, heat transfer out of the skin occurs and the change in skin temperature during contact affects the perceived coolness of an object touched by the hand and is essential for thermal cue-based material detection. When a hand touches an item, the thermal, surface, and mechanical characteristics, as well as the geometry of the object in contact, all contribute to the heat transfer process between the skin and the object (Hsin-Ni, 2018). These parameters have an impact on the change in skin temperature, which is essential for successful material identification. The coldness or warmth felt while physically touching an object can reveal information about the object's material composition and even shape, which individuals cannot immediately gather from the visual information (Hsin-Ni, 2018). Weight is also important, where for some types of products heavy products more often represent good quality products, and on the opposite light product represents the product of not so good quality or cheap products (Kampfer et al., 2017). In some cases for electronic devices situation is the opposite, consumers may perceive lighter products as better quality products. Occasionally, when consumer tableware-weight expectations are fulfilled by real tableware experience, the tasted food sample is considered

better, that is, richer and more expensive (Pramudya & Seo, 2019), or red wine bottles are rated heavier compared to white wine bottles (Piqueras-Fiszman & Spence, 2012). In addition, an increase in package weight affects both the desire and willingness to pay for the goods (Kampfer et al., 2017). According to the conclusions of the study, when packing weight decreases, consumers are more likely to perceive flavours as less intense and less favourable, as well as have a decreased desire to consume such food and beverage (Kampfer et al., 2017).

The form is another characteristic that is important in touch perception and it can be characteristic of packaging, a product, or even the interior of the store. The form can be a good expression of a brand itself that can make a difference when making the choice decisions between competitors (Hultén et al., 2009). Weight, surface texture, hardness, and temperature are all tactile variables to consider when it comes to product packaging. Any of these aspects can have a significant impact on how the consumer perceives the product or what he thinks about the goods stored inside (Velasco & Spence, 2019). However, sometimes the discrepancy occurs between the expected and true tactile feature that is critical in creating the consumer's expectations (where heavier than expected is normally good). In recent years, an increasing number of brands/packaging designers have been attempting to produce a distinctive characteristic feel that may help identify their brand from the competitors, inspired by classic examples such as the Coca-Cola contour bottle (Velasco & Spence, 2019). The tactile cues obtained from food products or their packaging have the potential to help companies improve product choice, satisfaction, and purchase intent. Interacting with product packaging during consumption or even simply touching the package when opening, may result in a customer's assumption of the package content (Pramudya & Seo, 2019). Confirming the importance of the packaging in shaping the consumer's touch experience, research by Ferreira (2016) demonstrates that the perception of the same product (grenadine syrup) tasted three times by each participant is different depending on the packaging. The experiment includes three different packaging materials: plastic, aluminum, and glass. Furthermore, package characteristics appear to have more influence on the participants with a high NFT than those with a low NFT (Ferreira, 2016). In the same vein, packaging weight correlates to more favourable flavour ratings, with flavour intensity being a quality indication of food and drinks (Kampfer et al., 2017). Everything stated above can be of great interest for the topic of this thesis, since the testing of the suitability to provide information on the three components using verbal descriptions is tested. The next part of the thesis will further discuss the receptors, collaboration of the sense of touch with other senses, and differences between the individuals when it comes to the perception of the sense of touch. It has been reported that there is little that people know about the sense of touch regarding its interaction with the outside world (Gallace & Spence, 2014, Hultén, 2020). With the current artificial intelligence trend many processes went through digitization, however, it is commonly being assumed that individuals' senses are still not possible to replicate and digitize completely. Tactile information receiving through artificial intelligence is still in the developing faze due to the complexity and sensitivity

of the human skin (See et al., 2022). The sense of touch also usually works in collaboration with other senses - vision, hearing, smelling, and taste (Grabowecky et al., 2011, Hultén et al., 2009). The sense of touch very rarely happens alone. Therefore, the full perception through the sense of touch can also depend on the presence of other senses. It is not the same if having hand contact with a partner or with a stranger on the street/public transport by accident (Gallace & Spence, 2014). In a conclusion, touch is not only contact with the skin surface but it also depends on expectations that one has, what he/she perceives and how a person values it (Gallace & Spence, 2014). In addition, regarding the sense of touch, only a few contacts with skin are with intent and many others are happening by chance that one is not even aware of. As mentioned earlier, the skin is the biggest organ and it is not possible to control happenings all over it and not let things work automatically. Therefore, many times a person does not pay attention to the sense of touch and does not even notice how important it is (Gallace & Spence, 2014; Hultén et al., 2009; Hultén, 2020; Racat & Capelli, 2020).

In many situations, other senses can enrich the sense of touch and complement each other (Gallace & Spence, 2014; Grabowecky et al., 2011; Racat & Capelli, 2020). After defining the sense of touch as one of the most active senses of living beings, one can now have an overview of how this sense functions when paired with vision. According to Hultén (2020), these two senses work jointly to improve object perception. In addition, Hultén (2020) states that individuals make findings on objects in two phases: first registering them with their eyes, and second picking them up or touching them to find out more and perceive them better. Usually, this action is done by hands and is more precise with fingers and fingertips as the most sensitive part of the hand. While examining the texture, weight, and temperature of the object individuals use physical interaction, like pressure or certain movements on the surface of the product, to develop mental interactions as well as evoke cognition and emotion. Hultén (2020) also defines tactile sense and touching as a sense that can explain rather than simply receptive sense. On the other hand, contact with the object can be static as well when simply checking the weight or temperature. Often vision and touch work together to help human beings in achieving their goals (Hultén et al., 2009, Racat & Capelli, 2020).

The sense of vision is the focus of many researchers and one of them stated that the sense of touch often influences the sense of vision (Grabowecky et al., 2011). The study confirms that the shape of the object that an individual hold in her hands can influence the success in a visual search for similar objects. For example, while searching for keys or a cell phone visually, one should hold other keys or phone in the hands and this will increase the chances of locating the object one is looking for. Gallace & Spence (2014) give another good example to distinguish between senses or to see how senses collaborate. Seeing photos of a sunny beach involves only visuals, where the sense of touch by touching photos does not provide good stimulation. Furthermore, the sound of the waves would be involved if watching the video of a popular tourist destination. What is missing now is the feeling of a gentle breeze in the hair, hot sand

under the feet and the warmth of the sun on the skin to have a fully memorable holiday experience. All mentioned tactile sensations enrich one's perception to have a better and deeper understanding of the holiday experience (Gallace & Spence, 2014). Visual images very often require an individual to come up with the tactile part alone, which for example comes from memories, to understand the concept in front of him/her fully (Peck & Childers, 2003b). Similarly, in collaboration with vision and remembering from previous experience, an individual can say if the basketball is round or rocks hard and heavy without touching them, even if just thinking or imagining the object. Perception of the product should be on a higher level for the consumer if the company implements tactile marketing to create memories for consumers and build a strong brand image from the beginning (Hultén, 2009).

To create a better experience or to leave a better impression on consumers companies can use tactile marketing in collaboration marketing that aims at other senses. The relationship between the consumer and the brand can be more personal, and a good relationship is especially valuable when it comes to product quality perception (Hultén et al., 2009). According to the authors, the same situation is with a handshake where the first impression is the most important one. In their work, the authors define some good examples of tactile marketing. Back in 2007, IKEA let the customers stay overnight to test the beds and linens' characteristics. There was no compensation for staying and sleeping in beds, and there was even an option of choosing different types of beds or even the ambient. Consumers were completely on their own overnight while having free breakfast in the morning. This brand engages consumers in touching many different materials, not only in the stores but also at home since the company is famous for letting the consumers assemble their products at home and making them interact with the products better (Hultén et al., 2009). Another useful example of tactile marketing is in the book of Hultén (2020) with the promotion of Lubriderm, a moisturizer and skincare product by Johnson & Johnson. The ad was a full-page model covered with the towel and the printing was on a little rough piece of paper, because of the sensory stimulation of skin roughness when touching the paper. It was possible to peel off the transparent cover of the arms and shoulders of the model and reveal the smooth part of the paper symbolizing the soft skin. Hultén (2020) confirms that because of this campaign, the sales were better by 16 percent than in the previous year. Similarly, various authors confirm the importance of a sense of touch in marketing processes (Değermen Erenkol, 2015, Racat & Capelli, 2020). Değermen Erenkol (2015) argues that touching is especially important in in-store perception and when evaluating the product. Consumers are more willing to purchase the products where they are allowed to touch and explore the product more. There is an empirical confirmation of the previous statement with clothes and electronic devices specifically, where individual achieves a better perception of quality (Değermen Erenkol, 2015; Grębosz & Wrońska, 2013; Peck & Childers, 2003b). Another example of the importance of a sense of touch in evaluation and satisfaction with the product is given by Değermen Erenkol (2015) where in the restaurants the weight of forks, quality of napkins and chairs, how fine the glasses are and table cloths all have a positive impact on

consumers' perception and satisfaction. Sense of touch is also important when considering consumers' consumption and consumers' decisions in various shopping environments (Racat & Capelli, 2020). According to the authors of this research, consumers are very active when choosing the product, and perception received sense of touch can send tactile information to the consumer's brain and therefore help in deciding and making preferences between the products.

Many producers are trying to engage with the consumers by providing them constantly with new and attractive materials or surfaces worth touching. By evoking the desire to touch it, they could also evoke the desire to have this product and make a positive purchase decision (Peck & Shu, 2009). One of the examples could be Microsoft which launched a new line of keyboards and mice whose parts are partly an imitation of leather, making them less boring than the simple plastics that people are used to (Pollák et al., 2021). The perfect examples of the easily recognizable form of products come from Toblerone and Pringles as uniqueness is the characteristic of their tactile marketing. The shape of products makes them easily recognizable and distinguished from other competitors. Another maybe even more famous product and company is Coca-Cola, with the characteristic glass bottle. Even small touch on the bottle can make an individual sure that the glass bottle touched is a part of Coca-Cola products. Another good example is a bottle of Swedish Absolut vodka with also unique and characteristic shape (Hultén et al., 2009).

Together these studies and examples provide important insights into the importance of a sense of touch in purchasing decisions. Considering the impact that tactile sensations can have on individuals it is not surprising that many designers and developers are working on tactile products and cover tactile stimulation in their activities in classic retailing. Developers' awareness of the advantages of tactile stimulation is increasing and this could just make them better at providing an experience for the consumers and more capable of sales increasing (Gallace & Spence, 2014). The rising trend of digital technology and the high development of online selling platforms, for now, have a lack of possibility for consumers to touch and use their senses with the full potential, as described earlier. If these were possible, that would be better for consumers and the companies working in the online environment as well (Hultén, 2020). It is a great effort for companies in online retailing to work on and overcome the challenges as one could see that touching is a need for some of the users when it comes to decision-making in purchase processes, especially when it comes to items like clothing, electronics, and other touch-related products.

## **2.2 The rise of online retailing**

Among all industries, one of the characteristics of recent years is the growth of e-commerce. Thanks to technology and the World Wide Web many companies in many different markets can reach their customers easier and grow their customer base (Martinez-Ruiz & Moser, 2019). In

2021, retail e-commerce sales amounted to approximately 4.9 trillion U.S. dollars worldwide. As a prediction, this number will further grow to 7.4 trillion dollars by 2025, almost 50 percent over the next four years (Chevalier, 2022).

Businesses operate in fast-paced marketplaces and must be up to date with globalization trends while adapting to frequent changes in customer behaviour in an online environment (Dumitrescu et al., 2015). Digitalization, constant movement of consumers, and mobility in information gathering force both, retailers and consumers to do things fastest and in the most affordable way no matter if it is an everyday task or something completely new (Grewal et al., 2018). Furthermore, it is more possible and easier to do so thanks to the internet and online retailing as well. In addition, the internet can influence and change marketing strategies, and whole business relations record shifts especially in consumer relations (Kambil, 2008). According to Kambil (2008), in online environments, it is more about the product's appearance or presentation, opposite in traditional physical environments where the interior of the store may be of importance. For this reason, recent researchers are focusing on new factors and disciplines such as psychological perspectives, namely individual preferences, emotions, and sensory experiences in their research about consumer behaviour in online environments (Martinez-Ruiz & Moser, 2019).

One of the benefits of online retailing is that individuals can do purchases from their homes, or anywhere else with mobile devices and it has never been easier than these days since one does not even have to search for anything specific, using just keywords instead when browsing is enough (Grewal et al., 2018). According to Jimenez et al. (2019), three important factors are influencing consumer's online shopping behaviour:

- There are more and more internet users around the world because of the increasing availability.
- Mobile devices are causing a greater number of internet users. One does not have to use only the computer for internet browsing anymore. Instead, small mobile devices such as cell phones are adapted to fast, reliable browsing, and their interface is understandable to everyone, no matter the age for example.
- New generations are growing with the new technologies, some even using it every day from an early age, and they do not have any problem with adaption or understanding of technologies.

Same researchers in their work also state that younger generations are more into online shopping since they are the ones with the information available in the palm of their hands most of the time and in almost every activity (Maat & Konings, 2018). Respondents in their research also state that reasons for online shopping are greater variety, better price, and convenience while shopping. In addition, the research of Xu et al. (2020) on human mental imagery of desire for money, which can make a difference in purchase decision processes for example, suggests



that in some conditions cash payments in physical stores can provide more discounts than e-payment. However, studies in the research confirm that online shopping may become more dominant in the future since the real money is not going directly from the hand of the consumer, so the focus of future research should stay on the area of online retailing (Xu et al., 2020).

Another reason for a better focus on online retailing may arise from the COVID 19 pandemic. Roggeveen & Sethuraman (2020) analyze how the world of retailing may change in reflection of the pandemic. In the beginning brick and mortar retailers of products that may not be that essential in a pandemic, like clothing and shoes, for example, had to react fast since the pandemic shifted sales online and influenced their sales negatively (Pantano et al., 2020; Roggeveen & Sethuraman, 2020). If these retailers did not have an online selling platform, they had to adapt and start offering online sales to maintain the business processes. According to Roggeveen & Sethuraman (2020), short-term reactions, such as online retailing, could fix the problem but also long-term planning was equally important since there were no assumptions about how online retailing will work after the pandemic. Most of the habits will likely stay as developed during the pandemic and online shopping will be the new dominant way of shopping (Gu et al., 2021). When it comes to the practical and comfortability aspects of online shopping it is assumed that people can easily adapt to more comfortable changes. Retailers now have to think of a way to make the shopping as close as possible to classic ways of retailing. Luckily, the online paying system was long in use even before the pandemic and only certain adjustments could make things work. In this context, Roggeveen & Sethuraman (2020) also state that consumers rather spend e-money than real money from their hands and that cash payments have more space for discount options.

Researchers about online shopping so far were covering the characteristics like demographics and socioeconomic factors (Wang et al., 2015). An interesting fact is that at the beginning of the online shopping era male users were more active than female users. However, newer studies indicate that gender is not a factor for differentiation between users anymore (Lee et al., 2015). However, as expected there were certain differences when it comes to the types of products that males and females are purchasing, where males are more electronics oriented while females rather purchase clothing online (Maat & Konings, 2018). The authors also confirm that majority of online shoppers are younger, more educated generations with easy internet access on multiple types of devices. However, there is an assumption that the number of internet users among older generations has an increasing trend also, which is thanks to the simplicity of device use and that no specific higher education is required for online shopping (Maat & Konings, 2018).

The work of Aw et al., (2021) report that there are two interesting types of consumer shopping behaviour - showrooming and webrooming. This trend is especially present in the retailing industry which is also the focus of the current thesis. The characteristic of showrooming and webrooming are the situations where consumers "cross" or "switch" the channels between online and physical stores particularly for the purchase phase. That is, they search, examine, and

make a decision about the item purchase in the online channel, but go to the physical store for purchase and vice versa. The percentages of consumers and their practices in the research of Aw et al., (2021) are as follows: 74% of the consumers practice webrooming, being searching online purchasing in a physical store, and around 57% practice the showroom, being opposite of previously mentioned searching in the physical store and buying online. Another research gives possible explanations for the phenomenon (Aw, 2020). Most likely, the lack of some sensory stimulations is the main cause of webrooming. Moreover, the tendency of consumers to practise showrooming can be the result of certain discounts for online shopping. One more time, there is a confirmation that consumer behaviours are on the never-ending changing path. By understanding why and how consumers change their channels, retailers will be in a situation where they can better influence and have “control” over the consumers. Aw et al., (2021) found that consumers with a high need for touch are more likely to practice webrooming, or changing from online to a real store for the purchase. The authors also state that this refers particularly to clothing and similar items that require more detailed quality and material analysis. However, other products that have lower haptic characteristics, like books or some types of electronics, have less space for the wrong choice and therefore are suitable for online retailing. In addition, Aw et al. (2021) state that switching from online to physical store may be a question of risk of purchase. Especially when it comes to new products that consumers are not familiar with and products that require more research in physical stores (Lian & Yen, 2013). Internet, at least for now, does not provide the possibility to use sensory marketing with full potential and therefore provide the consumer with complete evaluation and perception of new products. The current thesis contributes to this debate by providing evidence of the effect of tactile product descriptions on purchase intentions in online retailing.

One of the main obstacles in online retailing is consumers’ need for tactile input in this environment, (Citrin et al., 2003) . Furthermore, many researchers have provided their perspectives and responses on how to overcome the issue of touch deficiency in an online environment (Hultén, 2020). For now, Hultén (2020) gives an example of a system of purchase with various return policies where consumers can make the purchase freely, after the delivery to test the product in an even more relaxed home environment and if not satisfied to return the product to sender. Another additional benefit of online retailing is that return of products is usually free of charge or just with a small fee, which can be satisfying for many consumers and encourage them to practice online shopping.

### **2.2.1 Consumer online buying behaviour**

When making marketing strategies for online environments companies need to understand how the consumer uses the Internet or more specifically how the consumer behaves on the internet (Dumitrescu et al., 2015). The fast-moving environment and technology development can be good for both, the companies that are offering products and the consumers that can purchase or test the products. Therefore, knowing the consumer may be an advantage and might make

many businesses a step ahead of consumers or even a competitor. Dumitrescu et al. (2015) in the work provide certain facts about consumers' behaviour:

- It can have the characteristics of an individual or the whole group,
- It always includes satisfying a need or wish, no matter if personal or group one,
- It is always made of processes that then guide the consumer's final decision-making.

Since these are overall consumer behaviour facts, it would be of high relevance to investigate these behaviours also apply to the online environment and consumers' behaviour in online situations. The research of Dumitrescu et al. (2015) suggests that there is no big difference in behaviour between the two channels, except that in online channels consumer behaviour is complex and unpredictable. It is unpredictable thanks to the Internet and the possibility to buy the product from everywhere at any time. It is also more complex for researchers to study consumer behaviour in an online environment (Kotler & Armstrong, 2017). When it comes to the decision-making process in both, the online and the offline environment Kotler & Armstrong (2017) state that there are five steps:

- Identification of a need
- Search for the information
- Evaluating the options available
- Making the decision
- Behaviour after purchase

Here authors argue that the two most important steps for the consumers are "Search for the information" and "Evaluating the options". Kotler & Armstrong (2017) then measure the importance of the Internet in each step by using a five-step Likert scale (1 – very little importance, 5 – very important) and the results show that "Search for the information" is 4.06 and "Evaluating the options" is 3.95. Therefore, if marketers manage to address the consumer in any of these two steps while using the internet, their chances for attention keeping and positive influence on the purchase decision is possible. This might work in online retailing while the consumers are evaluating their options even more before the purchase (Dumitrescu et al., 2015).

Many researchers show that purchase decision is positive after certain positive emotional reactions after touching the product (Hultén, 2020; Krishna, 2013; Peck & Wiggins, 2006). Especially when there is no additional information about the product displayed and therefore there is a higher need for touch and exploring. Therefore, businesses should encourage the consumers to engage more in having psychical contact with the product since consumers will evoke a psychological reaction towards the product and be able to gather more information about the product itself. Of course, this is the case in brick and mortar retailing stores (Hultén, 2020). When gathering information in an online environment situation is slightly different.

Gligorijevic (2011) analyze the main drivers for purchase decisions and their differences between online and offline retailing. She confirms that the majority of consumers search for product and investigate it more online, but when it comes to purchases they tend to shift to the classic retailing facility. In some cases, like the price level, the process can go in the opposite direction as well. Similarly, the results of research conducted by Aw et al., (2021) confirm the same for both cases. Gligorijevic (2011) perform the investigation in Australia by interviewing 22 shoppers from that area. In her statement, there is an interesting fact about online retailing where individual's research could sometimes take days before any decision. The online environment is of course more suitable place to do a few days' investigations than staying in the brick and mortar store. In addition, the author confirms that when it comes to online retailing consumers tend to use the websites that they are familiar already and that they already trust. According to research, word of mouth and friends or family recommendations have a significant influence on purchase decisions. In addition, user reviews in online retailing play an important role when the consumer is making decisions in this environment (Gligorijevic, 2011). In the same vein, von Helversen et al. (2018) confirms the role of product ratings for consumers in an online environment while making a purchase decision. The author states that consumers prefer products with a higher average rating and better characteristics; however, one negative rating may have a high influence on consumers and make them quickly change their minds. The most valuable advantage of brick-and-mortar stores according to Gligorijevic (2011) is that brick and mortar stores provide a possibility to physically touch the products. However, according to her research, many consumers decide to conduct the purchase online for the reason of the significantly lower price in online retailing compared to brick and mortar stores. According to many studies, internet retailing is not far behind traditional retailing when it comes to delivering product information for a consumer's purchasing choice. (Aw et al., 2021; Gligorijevic, 2011). The only aspect that may be improved is the lack of a feeling of touch as the primary instrument in purchasing choice processes (Gligorijevic, 2011).

In addition, another research by Jha et al. (2019) confirms that it is more important for the consumers that they have a chance to explore the product in traditional retail stores. The possibility to touch the product also goes a little more psychologically and creates an effect of perceived ownership that can have a positive influence on purchase decisions (Peck et al., 2013). Authors find out that in brick-and-mortar retailing proximity between the consumer and the product plays a certain role in the evaluation of the product. More concrete, being able to touch consumers feel closer to the product, they can research it properly and evaluate it positively. Other authors support this view in an online environment where there is a greater distance between the product and the consumer, and therefore haptic information does not play any role in the evaluation of the product (Liu et al., 2017). Jha et al. (2019) also add that consumers better perceive the haptic product (in this case blanket) in an environment that enables them to touch it and that there is no significant difference when it comes to a product with no haptic characteristics (flash drive in this case) between the environments where touch is or is not

possible. In the second study, they had the same conclusion only using different products, a sweater as the one valued better in the touch environment and a DVD player that again did not record any significant differences between the touch and touch environment. By investigating haptic and non-haptic products in online and offline markets, the main conclusion that come from Jha et al. (2019) researches is that effective response (emotions or the overall feeling towards the product) has a stronger effect in the touching environment while making an evaluation of the product than cognitive response (reaction in response to information perceived through senses).

In addition to the previously described interaction of vision and touch, Peck & Childers (2003b) in their work analyze how exactly written description, in addition, can partly improve information gathering if the consumer gets little or no information through touch, which can be relevant for the current thesis. Authors state that additional information on products' haptic characteristics can improve the lack of possibility to investigate the product through touching. In cases when the consumer already has some information in memory, with additional visual information he can build up new views and conclusions (Peck & Childers, 2003b). More detailed, information like the weight of the product in visual form (information in numbers) can evoke the experience from the past, process the new information, and compensate for the lack of touch. Not just the vision on weight, but also the vision on objects surface may also evoke activity in neural circuits associated with tactile stimulation according to Sun et al. (2016). This would not be the case with the autotelic need for touch (consumers that touch for pleasure), where any additional visual information does not make big difference in the perception of the product (Sun et al., 2016). For consumers that are not that active in touch, or have a lower need for touch, visual perception by itself can be enough to develop a picture of the characteristics of a product (Peck & Childers, 2003b). They can retrieve the information from their memory by simply looking at the product. Therefore, in conclusion, the authors confirm that when the consumer is not able to touch, the picture or visual of the product might partly help in assessing instrumental haptics from the past. In addition, consumers who touch for pleasure (autotelic) will not find the picture as a suitable substitution for a lack of sense of touch (Peck & Childers, 2003b).

When it comes to purchasing intention and willingness to pay for a product Liu et al., (2017) have some interesting findings in their work. They state that consumers who do not further think about the information that they have (thinking on the surface - concrete thinkers) and therefore who mentally concretely visualize a product – and hence require information on its low-level tactile qualities (softness, heaviness, smoothness) to reliably evaluate its quality – will have more purchase risk concerns while shopping online. According to Liu et al., (2017), concrete thinkers may rely more on the sense of touch when making decisions about a purchase. More detailed, after using the sense of touch to explore the product they tend to make positive decisions regarding purchase intention and willingness to pay. Further, the authors state that consumers

who tend to think more and explore more about the information that they already have (thinking in depth - abstract thinkers) put more attention on higher-level features such as price and overall impression and do not change their purchase intention significantly if touch or no touch is present during purchase. Therefore, a consumer's cognitive style may affect the purchase intention in both environments, online and traditional retailing. Similarly, in the work of Grębosz & Wrońska (2013) authors state that men and women do not have the same reaction to sensory stimuli when it comes to the choice and evaluation of textile products. In addition, emotional or cognitive variables could not explain the male purchase behaviour, contrary to women. Authors suggest that sensory strategies should more focus on females due to their higher sensitivity. Liu et al. (2017) based on the experiment additionally state that abstract thinkers have a greater tendency to make a positive purchase decision when touch is not present at all. When the availability of touch is limited, these consumers use their detailed thinking about the product and make conclusions about the quality themselves. They are the people who always ask "why" and try to find more and more information from one simple piece of information or to evaluate the benefits and consequences of some decision.

When it comes to touch, this sense finds implications in different cases and in different ways for many different individuals (Krishna, 2013). In some cases, convincing the consumers to touch the product (or not to touch it) can be challenging. In classic retailing, by changing the package for example, or changing the setup of the interior of the store the goal of consumers' involvement is achievable. Finding out how well the haptic product descriptions can perform in reaching the goal of better consumer involvement is not an easy task, especially when it comes to the replacement of the whole sense of touch. In some cases, the question is if the consumer is even motivated or has the tendency to touch the product at all. According to Hultén (2020), some consumers find touching convenient some do not, for some touching has an influence on purchase decisions and for some does not. The author also states that there are differences in how much or how long the individuals have to touch the product to fulfil their goals of exploring the product or solving the inquiries that they may have. At the same time, the main actions toward the consumer may be sensory stimulation to provide a better experience and fun. In addition, when there is a chance for the consumer to touch the product this can then lead to a purchase that was not even in the consumer's plan of action before the act of touch (Gligorijevic, 2011). The information gathered through a sense of touch is precious and the assumption is that there is little to compensate for and influence consumers' behaviour. Softness, temperature, and texture are characteristics that only the sense of touch can register. It also provides an emotional experience that no other stimuli can compensate for (Abhishek et al., 2014). Products like clothing and fashion products are most likely to have success in traditional retailing when it comes to the purchase intention of the consumer (Hultén, 2020). Therefore, the companies and businesses doing online retailing should put some extra effort into the tactile information of the products to better control and understand consumer purchase behaviour.

### 2.2.2 The relevance of products descriptions

Mccabe & Nowlis (2003) in their work confirm previous statements from this thesis that consumers rather purchase so-called material products (that require touching for better perception) like clothing and fashion in classic retailing stores. It also refers to so-called geometric products where there is no big difference between online and classic retailing shops. In addition, they also examine the verbal descriptions and their effect in environments where touch is not an option. The authors tried to transform the information that one usually gathers from the sense of touch into the written form and evaluate if this will affect consumers' perception. In Mccabe & Nowlis's (2003) research, the product is a towel and the authors explain that towel description can be regarding the colour, size, and content of the material. To be more precise and to evoke a sense of touch description should describe how the towel feels against the body or skin. Therefore, one of the descriptions used was "feels soft against your skin" to increase the description of how would it feel if touched. The authors use various manipulations in their research such as real products and the possibility to touch, a real product with similar descriptions as mentioned earlier, a non-touchable product, a non-touchable product with the descriptions, and a picture with the list of characteristics. The product manipulation covers both material and geometric products. In a conclusion, Mccabe & Nowlis (2003) found that in online environment material products (that require touching for better perception) with all the characteristics in the description regarding touch properties had greater preferences than the descriptions regarding visual properties. They also suggest that business owners of the online retailing platform should go more into detail when making descriptions of the products, especially when it comes to touch characteristics. A simple list of just visual characteristics may not be enough.

The relevance of product descriptions is supported by the study of Mitchell & Olson (1981) which showed that an advertisement with a verbal description ("soft") and an advertisement with a picture of a kitten prompted participants to view the product as softer than campaigns with other sorts of visual imagery. In addition, the softness rating for the kitten ad was even higher than the one with an explicit verbal message. Similarly, Kim et al., (2014) observed that in the hospitality industry the description in hotel marketing might persuade consumers to imagine beds as more comfortable. Haptic description cues may have an important impact on consumers' decision-making on hotel booking in the hospitality industry. Lv et al. (2020) argue that haptic cues (descriptive information offered in online reviews) have a substantial impact on customers' desire to make a hotel room reservation online support this view. The authors state that haptic signals (verbal or visual) may influence customer booking in the online setting and that tactile information is significant even when direct tactile sensation is unavailable. Particularly online reviews, in which customers describe their hotel stays, are a significant source of consumer information when making hotel booking selections, and often contain tactile information. According to Lv et al. (2020), examples of positive haptic cues are "The bed was

neither soft nor hard, and was comfortable and relaxing”, “The slippers were soft and thick, and had a good texture”. Positive haptic signals resulted in a large increase in consumers' desire to book when compared to a simple description of hotel attribute information, while negative cues resulted in a significant decline. An example of a negative haptic cue could be “The pillow was too high and uncomfortable to sleep”. The investigation also revealed that, while customers were unable to have direct haptic sensations, the verbal description of the haptic information stimulated mental imagery, which acted as an intermediary of the influence of booking intention. Hotel marketers may create tactile experiences to compensate for the sensation of touch by using authentic haptic signals such as written descriptions, high-definition images, and even virtual reality (Lv et al., 2020).

### **2.2.3 Tactile product description**

Tactile sensitivity does not spread evenly over the body's surface where the sense of touch is most sensitive in the fingers and the mouth, tongue, and lips a close second (Guinard & Mazzucchelli, 1996). Therefore, an interesting factor in the product description in the food sector is the “mouthfeel”. During the consumption of food or drinks, many different events occur in the mouth and even the most advanced texture analyzers cannot reproduce what mouthfeel may reveal to the consumer (Guinard & Mazzucchelli, 1996). Spence et al. (2013) analysed mouthfeel and described it as a term used to characterize the sensation individuals get in their mouths while eating a certain food or while drinking. Authors give a great example of olive oil that may provide an oily sensation, whereas food containing menthol may produce a cooler mouthfeel. Sticky, bitter, stinging, greasy, and other mouthfeel characteristics are typical and commonly met in mouthfeel descriptions. Spence et al. (2013) provide an interesting fact that the textural features of a dish or a drink can also play a role in what individuals find appealing about certain foods, and how do they decide on a favourite one. According to the authors, another good example is marketing for mass-market red wines that frequently include mouthfeel: a recent print advertisement for Blossom Hill Winemaker's Reserve Merlot with the description as “velvety, silky, and has impeccable taste.” In the same vein, Fox et al. (2022) conducted research about mouthfeel in the beer industry as an important factor when deciding on the preference of beer type. In their work, text mining and grouping of the written reviews resulted in the creation of seven sensory descriptors for mouthfeel being “watery,” “smooth,” “thick,” “bitter,” “foam,” “astringent,” and “sour”. These findings offer several important new insights. First, they may be useful when giving cues to future consumers about the mouthfeel. Secondly, results show that online beer reviews can be a great source of sensory data, and thirdly, they show that tribology (the science and engineering of interacting surfaces in relative motion) can be used to determine important mouthfeel parameters in beer and it can be assumed on other types of drinks (Fox et al., 2022). The recent work of Agorastos et al., (2020) confirms a need for developed consumer-oriented mouthfeel vocabulary since not all the consumers speak the same language and standardization could partially improve the



communication. The authors also state that it is just as essential to be aware of texture and mouthfeel as it is of flavor. Therefore suitable description regarding viscosity could be - thin, thick, and viscous. Body-related description terms of food or drink may be heavy, watery, and light. Agorastos et al., (2020) define resistance to tongue movement with suitable descriptions such as – syrupy, pasty, and sticky. In addition, surface feel terms may be - smooth, grainy, powdery, slippery, sticky, and creamy. After testing physiological feelings may be - refreshing, warming and filling, and regarding temperature - cold, hot, warm and cooling.

Another interesting factor in the food product description is the texture of the product. The word “texture” was coined to describe the visual and tactile qualities of materials (Guinard & Mazzucchelli, 1996). Afterward, the term found usage in describing a variety of items, including foods. The response of tactile senses from the contact of some part of the body, usually hands, and the food may give appropriate information about the food texture. According to Guinard & Mazzucchelli (1996), texture refers mostly to solid and semi-solid food and mouthfeel refers to tactile aspects felt from the moment solid, semi-solid, or liquid foods (beverages) are in the mouth until the moment they are swallowed. Additionally, texture perception is an extremely dynamic process since the physical properties of meals change frequently in the mouth while they are in the process of consumption. According to Guinard & Mazzucchelli (1996) meals advertised as “crunchy” were mechanically stronger and had a lower frequency of sound than foods branded as “crisp”. These characteristics could lead the consumers in the purchase decision-making process. Crispness, crunchiness, softness, juiciness, and firmness are the most desired textural attributes among North Americans as revealed in the study. In addition, the Japanese enjoy crispy, crunchy, hard, soft, and sticky foods, which may be beneficial in making the description of the products that will enable a consumer to perceive the texture and mouthfeel even before the consumption.

Some authors argue that the name of the dish gives a good indication of what to expect from the flavor (Wansink et al., 2005). Even adding a simple word such as “tasty” in front of the food name may make a difference in consumers’ food evaluations. While individuals may assume that they are familiar with the decision about the preferred meal already, the cues such as tactile descriptions in front of the food name tend to have a surprising impact on them. A study by Wansink et al. (2005) shows that when consumers were facing descriptively named dishes, they made more positive comments about them and rated them as more attractive, tastier, than identical and not descriptively called alternatives. This study demonstrates how changeable cues such as different variations of meals name can have an impact on an individual’s sensory judgment of the item (Wansink et al., 2005). In the same vein, Yao et al. (2021) argue that creative text descriptions are usually more persuasive than non-creative ones in an online setting. In addition, the persuasiveness of creative descriptions can be enhanced for persons willing to develop their ideas, cognitive processes, and interpretations.

## 2.3 Conclusion of literature review and introduction of hypotheses

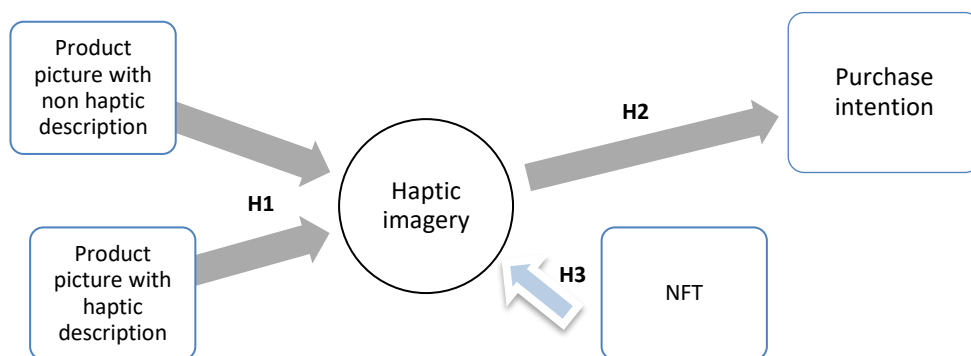
The previous subchapters highlighted the most important concepts and theories in order to be able to explore the effect of tactile product descriptions in online retailing. The first part of the theoretical framework introduces sensory marketing, it defines how a sense of touch is important, and how addressing of sense of touch is important in the purchasing processes. The first part also defines the factors that may affect the sense of touch and different need for touch for different individuals. The next subchapter, online retailing, especially describes the topic from a consumer buying behaviour point of view, such as how consumers behave in online retailing and what are the factors important to consumers in online retailing. After introducing online retailing, the following subchapters define the importance of the product descriptions, as well as some of the tactile description implications and their relevance in the online retailing environment. The hypotheses that will be tested later on in the research may at this point be introduced. These are:

**H1.** Haptic product descriptions will stimulate haptic imagery

**H2.** Haptic imagery positively impacts purchase intention

**H3.** Need for touch influences the positive effect of haptic imagery on purchase intention.

Figure 2 illustrates the research framework of the current thesis.



**Figure 2.** Research framework

The next chapter will introduce the methodology and data collection procedures needed for assessing the introduced hypotheses.

### **3 METHODOLOGY**

This chapter describes the research method that was chosen to investigate to what extent consumers rely on haptic product information in online retailing and why this method was used. Furthermore, this chapter will introduce the experiment will be introduced and detail the process of the data collection. Finally, this chapter will describe how the collected data was analysed and which analysis methods were employed.

#### **3.1 Research design**

This current thesis explored the effects that haptic product descriptions have on consumers when they are making decisions in an online purchasing environment and compared two different product descriptions. The assumption is that a product picture with a haptic product description will stimulate better haptic imagery for consumers and therefore influence the purchase decision. If better haptic imagery provides better and more accurate quality awareness then this may lead to potential positive purchase intention.

The focus was on haptic imagery and purchase intention as dependent variables. The thesis compared two different product descriptions using an online experiment with a fictitious online retail website. The research employed a one factor (tactical descriptions vs. no tactical descriptions) between subjects design. In the first condition, participants were exposed to a product description without haptic information, while in the second condition, they were exposed to a product description with haptic information. Comparing the outcomes of these two conditions may provide valuable insight that can be used to address the senses and improve sensory marketing strategies more effectively. During this examination, NFT was considered as a covariate. The data collection for this experiment is made through an online survey. The decision of selecting a quantitative research method and especially conducting an online experiment can be supported by many reasons, which will be outlined in more detail in the subsequent paragraph.

An online experiment with the fictional retailing platform was suitable since the thesis aimed to discover the causal effects of tactile information on purchase decisions. Experimental research (rather than descriptive or exploratory research) is better suited for explanatory research with the purpose of examining cause-effect correlations. Experimental research is also an optimal method when researching a small, well-defined collection of independent variables that may be modified or controlled (Bhattacharjee, 2012). This statement is further confirmed by Field & Hole (2003), who noted that the goal of the experimental techniques is to give a comparison of scenarios (commonly referred to as treatments or conditions) in which the suggested cause is present or missing. The most basic experiment manipulates the causal variable to have two levels, supposed cause present versus supposed cause missing, however, further levels can be added. Furthermore, when compared to other research designs, causal research design provides

superior internal validity due to its capacity to link cause and effect through treatment manipulation while controlling for the false influence of external factors (Bhattacharjee, 2012). The author of the experiment also has greater control over variables and can better determine their effect. In addition, random assignment in experiments serves to reduce selection bias and equalizes groups based on the predicted values of all variables, including unknown variables.

Finally, other studies that have examined tactile cues also applied causal research design for the aforementioned reasons. In most cases, the data was collected via questionnaires. For example, Hultén (2013) employs experimental research and shows that applying sensory cues in retail, especially those concerning the human senses, helps create successful and positive purchase experiences at point-of-purchase. In a more recent study, Lv et al. (2020) conduct an experiment to investigate the impact of verbally transmitted haptic signals on customers' online hotel booking decisions, as well as the function of mental imagery as a moderator. Donato & Raimondo (2021) conduct an experiment to investigate the effect of online information sources on consumer responses, taking into account the role of product type (low- vs. high-touch products), the role of information type (tactile vs. generic), and the moderating role of NFT. In addition, an experiment by Ferreira (2016) showed the influence of tactile contact with the packaging on product perception. Based on the reasons in the previous paragraph and similar studies, it was determined that the best way to assess tactile product descriptions and the impact on dependent variables was the application of experimental design.

## **3.2 Procedure**

This section outlines the experiment's structure, the pre-test, and the pre-test and data collection method.

### **3.2.1 The experiment structure**

The experiment had two groups. The control group exposed respondents to a product with a photo (the unisex hooded sweatshirt) and a classic product description, and the experimental group showed the same product photo but with haptic verbal information (product description). Participants were randomly assigned one of the two groups, with or without haptic descriptions.

The experiment consisted of three parts. In the first part, participants were asked if they made an online purchase in the past twenty-four months. This was the filter question, where in the case of a negative answer, the participant was redirected to the end of the questionnaire and therefore was disqualified from the sample as a not recent online shopper. Participants who passed this stage as recent online shoppers saw the picture of the unisex hooded sweatshirt together with the product description, and they were asked to perceive it as a picture and a description from their favourite online retailing platform. In addition, participants were asked to read the product description carefully and after 20 seconds of exposure, which represented the main stimulus, they were then able to proceed to the next page of the experiment. In the

case of the experimental group, a tactile product description was displayed together with a picture of the product. Figure 3 displays a screenshot of the stimulus presented to the experimental group.



- Very soft, smooth material, with thick bracelets providing good grip
- Soft-touch material is comfortable for everyday use
- With a cozy, flexible hood that will keep you warm on colder days
- Polished zip without any sharp edges
- Unisex product completely made of soft cotton
- Fluffy from the inside and firm enough from the outside

**Figure 3.** Screenshot of the tactile product description stimulus

Figure 4 displays a screenshot of the stimulus presented to the control group.



- High-quality material, with bracelets providing good grip
- Suitable for everyday use
- With a hood that will keep you warm on colder days
- Zip without any edges
- Unisex product completely made of cotton
- Comfortable inside and stable outside material

**Figure 4.** Screenshot of the classic product description stimulus

After being exposed to the stimulus, participants moved to the second part of the experiment and had to answer questions regarding the evaluation of the particular product description, i.e., how helpful, useful, or informative it was. The next question asked whether or not the description provided tactile information. These two constructs were a representation of a manipulation check. The next set of questions referred to the perceived haptic imagery of the product in order to investigate if consumers were able to imagine holding the product or were able to gain better insights into the texture of the product. The next part of the experiment examined the consumer's purchase decision, and the final part of the questionnaire investigated consumers' need for touch, which was an important part of this thesis study.

As mentioned above, several constructs were measured throughout the experiment. The measurement scale and questions for the quality of product information were used as manipulation checks and adapted from the study by Zhang et al. (2011). Another manipulation check scale was an item measuring if haptic information was provided in the description, and the questions asked about haptic, tactile, and "how the product feels" elements in the description. The terms "haptic" and "tactile" may not have been familiar to all the respondents, so the phrase "how the product feels" was also included. Moreover, scales for the haptic imaging of the product were adapted from the study by Peck et al. (2013) to examine if the consumer managed to develop the feeling of "moving fingers on the product," "examining the texture," or "holding the product in hand." In addition, the purchase decision scale was adapted from the study by Spears & Singh (2004), and it consisted of the following measurements: "I definitely intend to buy this product," "My purchase interest is high," and "I will definitely buy this product." Lastly, the respondent's need for a touch measurement scale was adapted from Peck & Childers (2003a), who initially introduced the need for a touch measurement scale, which many tactile-related experiments have used. It consisted of several questions regarding consumers' touch behaviour as well as the reasons why individuals may engage in the touch process. All of the items in each of the aforementioned scales were measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

The final section of the experiment covered the demographics of the participants and asked about their age, gender, and education level. Participants were also asked about online shopping frequency, as this information may be useful for the study.

### **3.2.2 Pre-test**

Before distributing the online experiment, a pre-test was conducted to determine whether the random function works correctly, whether the questions and phrasing are clear to participants, and to detect any errors within the survey. Approximately 15 volunteers had an opportunity to fill out the survey and give feedback on the important aspects for the proper questionnaire function.

After completing the online experiment, most of the participants' comments were that the questions are understandable and no changes to the online experiment were made.

### **3.2.3 Data collection**

SoSci survey, which is a platform to create online surveys, served as a platform for the online experiment creation. English was the language of the online experiment and the completion time was approximately 3-4 minutes. Respondents could find the survey link on the online sharing platforms, as well as the word-of-mouth technique. The sample is a convenience sample with the student's family members, friends, colleagues and participants reached through the snowball technique. The data collection period was approximately two weeks and resulted in a sample of 101 participants. The experimental group consists of 51 participants while 46 participants filled out the survey for the control group. Some of the data for four participants is missing, therefore the data of four participants were excluded from the further analysis. The final version and all questions of the online experiment can be found in Appendix 1.

### **3.3 Data analysis**

This section of the thesis describes the process of preparing the data for the analysis as well as the tools and procedures that will serve for the hypothesis testing.

New variables were created within the dataset to make the work in the statistical program easier. For both the experimental and control groups, a new numerical group variable was constructed. All participants that were previously randomly assigned in the experimental group were with the new variable assigned to group '1,' whereas everyone in the control group was assigned to group '0.' In addition, for few of the measurement scales composite scores are generated as new variables and they could serve for the further analysis and testing.

The data analysis consists of three parts. After assessing the scales' reliabilities, and conducting the manipulation check, in the first part of the analysis, a test in SPSS will serve in order to assess the effect of haptic product descriptions on haptic imagery, which is H1. For that, a MANCOVA, a multivariate analysis of covariance will serve. The dependent variable of the MANCOVA test is haptic imagery and the group variable (experimental or control group) is considered the independent variable. The respondents' NFT is considered a covariate in this example. Further, in the second part, the regression analysis test will give insights on H2, where haptic imagery is an independent variable and purchase intention is a dependent variable. Finally, for investigating H3, namely whether NFT influences the positive effect of haptic imagery on purchase decision, a regression analysis will serve. The next chapter of the thesis will discuss the results of the experiment.

## 4 RESULTS

### 4.1 Sample characteristics

In total, 97 valid responses were obtained and the sample characteristics are summarized in Table 1. The majority of the survey respondents were female, accounting for 55.7% while 41.2% were male participants. The rest of the participants, 3.1 %, preferred not to say their gender. The mean age of the sample lies at 27 years old. In the case of the highest completed education, 87.6% of participants have completed their university studies and 9.3% have a high school degree. The data analysis has also shown that from the sample, the majority of the respondents practice online shopping 1 (32.7%) to 2 (21.8%) times a month (see Table 1).

Sample Characteristics	N=97
Mean Age	27
<b>Gender (%)</b>	
Male	41.2
Female	55.7
Prefer not to say	3.1
<b>Education (%)</b>	
University	87.6
High school	9.3
Vocational school	1.0
Apprenticeship	2.1
<b>Frequency shopping (times a month)</b>	
1	32.7
2	21.8
3	12.9
4	3
5	12.9

Table 1. Sample characteristics

### 4.2 Scales reliabilities and manipulation check

The scale reliabilities must be evaluated to assure the consistency of the items measured. Therefore, Cronbach's Alpha values were determined for each construct. Table 2 summarizes the reliability analysis results and lists all of the items assessing each construct. According to Field (2009), an adequate level of reliability is reflected by Cronbach's Alpha values between 0.7 and 0.8. As shown in Table 2, for the current experiment, all constructions produce adequate Cronbach's Alpha values above the 0.8 figure.



Construct/Items	Cronbach's Alpha if an item deleted	Cronbach's Alpha
<b>Haptic Imaging</b> (Peck et al., 2013)		<b>.881</b>
I could imagine moving my fingers on the product	.829	
I felt that I could examine the texture of the product	.845	
I felt as if the product was in my hands	.819	
<b>Purchase Intention</b> (Spears & Singh, 2004)		<b>.915</b>
I definitely intend to buy this product	.858	
My purchase interest is high	.819	
I will definitely buy this product	.816	
<b>Quality of product information</b> (Zhang et al., 2011)		<b>.895</b>
The detailed product information was very helpful	.823	
The detailed product information was very useful	.820	
The detailed product information was very informative	.913	
<b>Haptic Information Provided (Manipulation Check)</b>		<b>.827</b>
The description provided information about the haptic qualities of the product	.716	
The description provided information about the tactile qualities of the product	.711	
The description provided information about how the product feels	.856	
<b>Need for Touch scale</b> (Peck & Childers, 2003)		<b>.810</b>
I feel more comfortable purchasing a product after physically examining it	.814	
I place more trust in products that can be touched before purchase	.786	
The only way to make sure a product is worth buying is to actually touch it	.822	
There are many products that I would only buy if I could handle them before purchase	.793	
When walking through stores, I cannot help touching all kinds of products	.768	
Touching products can be fun	.769	
I like to touch products even if I have no intention of buying them	.772	
I find myself touching all kinds of products in stores	.774	

**Table 2.** Reliability analysis

In addition, analysis of "Corrected Item-Total Correlation" as well as "Cronbach's Alpha if Item Deleted" are performed. These results reveal whether or not the specific variable has a beneficial impact on the construct as a whole and whether or not it should be removed. Each result in the "Corrected Item-Total Correlation" should be greater than 0.3, which is the case in this experiment analysis conducted in SPSS. Further, each value from the results of "Cronbach's Alpha if Item Deleted" must be compared to the total Cronbach's Alpha value. If all of the values are less than the aggregate Cronbach's Alpha, it may be claimed that each element improves the construct's reliability. In this experiment, a few values are showing that if an item is deleted Cronbach's Alpha could have a better value. However, as the overall reliability of all the affected constructs is good and deleting the item would not considerably increase the reliability, a

decision is made to leave the constructs as they are. Overall, each construct indicates good reliability, and no adaptations are needed regarding the constructs of the research.

Further, a one-way ANOVA was used for the manipulation check to assess the effectiveness of the manipulation of the experiment. In addition, the manipulation check analyse whether the participants were able to recognize the exposure to the stimulus. The “Haptic Information Provided” scale which consists following statements rated with a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) was considered for the manipulation check, including the following items:

- The description provided information about the haptic qualities of the product
- The description provided information about the tactile qualities of the product
- The description provided information about how the product feels

In addition, another scale could serve as a manipulation check, and therefore One Way ANOVA was conducted over the “Quality of product information scale” which consists following statements:

- The detailed product information was very helpful
- The detailed product information was very useful
- The detailed product information was very informative

For both scales and the analysis of the results composite scores were used. For the “Haptic Information Provided” and one-way ANOVA, the results are as follows. There was a significant effect for the dependent variable,  $F(1, 95) = 6.56, p < .001$ . In addition, the mean values and standard deviation results for the tactile description are ( $M=5.81, SD=0.96, N=51$ ) and for the classic description ( $M=5.24, SD=1.21, N=46$ ). The assumption of homogeneity of variances was tested and found tenable using the Levene’s test since significance value is greater than the .05. Therefore, it is concluded that the result is significant and the manipulation test was successful. The second test with “Quality of product information scale” gave the results for the tactile description ( $M=5.45, SD=1.13, N=51$ ) and for the classic description ( $M=5.06, SD=1.18, N=46$ ). The assumption of homogeneity of variances was tested and found tenable using the Levene’s test since significance value is greater than the .05. Finally, a one-way ANOVA revealed the following results for dependant variable  $F(1, 95) = 2.70, p = 0.104$ , and therefore it is concluded that for this dependent variable there is a tendency. Overall, the results of the two tests indicate that the manipulation check was successful. Therefore, the research resumes with the hypotheses testing.

### **4.3 Hypotheses testing**

In the first stage of the hypotheses testing the ANCOVA will serve to assess the H1 hypothesis. The “NFT” variable serve as a covariate in this test. First, in order to conduct the ANCOVA an

assumption of normality is tested for the variable “Haptic Imagery”. The results of both, the Kolmogorov-Smirnov and Shapiro-Wilk tests show significance. The Shapiro-Wilk p-value of  $p = 0.149$  is accepted and shows that a value greater than a .05 confirms that data of the variable “Haptic Imagery” comes from a normal distribution. In the ANCOVA, the results of Levene's Test of Equality of Error Variances show the significance of  $p = 0.497$  therefore the assumptions are met and further analysis of the results is possible. Further, the Tests of Between-Subjects Effects (see Table 3) shows that the covariate “NFT”  $F(1, 94) = 2.52$ , and has a significance level of  $p = 0.116$  and therefore does not adjust the association between the predictor and outcome variable. In addition, the variate “Experimental Condition” has a significance level of  $p = 0.001$  and therefore is statistically significant for tested “Haptic Imagery” as a dependant variable. An analysis with the haptic imagery as the dependent variable and the experimental setting as the independent variable revealed that respondents exposed to tactile conditions had better haptic imagery ( $M=4.98$ ,  $SD=1.43$ ) than the classic experiment condition ( $M=3.98$ ,  $SD=1.31$ ) (see Table 4). At this point regarding the H1 hypothesis, that haptic product description will stimulate haptic imagery it can be said that the outcome of the between-subjects test is significant, as  $F(1, 94) = 12.69$ ,  $p = 0.001$ . Therefore, the H1 hypothesis is confirmed. Table 3 shows an overview of the ANCOVA Tests of Between-Subjects Effects.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	29.007	2	14.503	7.740	.001
Intercept	44.179	1	44.179	23.578	.000
NFT	4.718	1	4.718	2.518	.116
Experimental Condition	23.782	1	23.782	12.692	.001
Error	176.130	94	1.874		
Total	2173.889	97			
Corrected Total	205.136	96			

**Table 3.** Test of Between-Subject Effects

Dependent variable: Haptic Imagery			
Experimental condition	Mean	Std. Deviation	N
Tactile description	4.98	1.43	51
Classic description	3.98	1.31	46

**Table 4.** H1 – Descriptive statistics

In the next step of the analysis a regression analysis is performed to address the validity of the **H2** hypothesis. Since the **H2** addresses positive influences of the haptic imagery on purchase intention, the independent variable is haptic imagery and the dependent variable is purchase intention. As a part of the analysis assumption for linear regression and no specific outliers is performed (see Figure 5). The first results from the model summary, that gives the value of R

and  $R^2$  for the model, show  $R=0.566$  and suggests low positive correlation between haptic imagery and purchase intention. The value of  $R^2=0.321$  indicates that haptic imagery can account for 32.1% of the variation in purchase intention. The next part of the output, ANOVA, reports an analysis of variance and it is shown in Table 5.

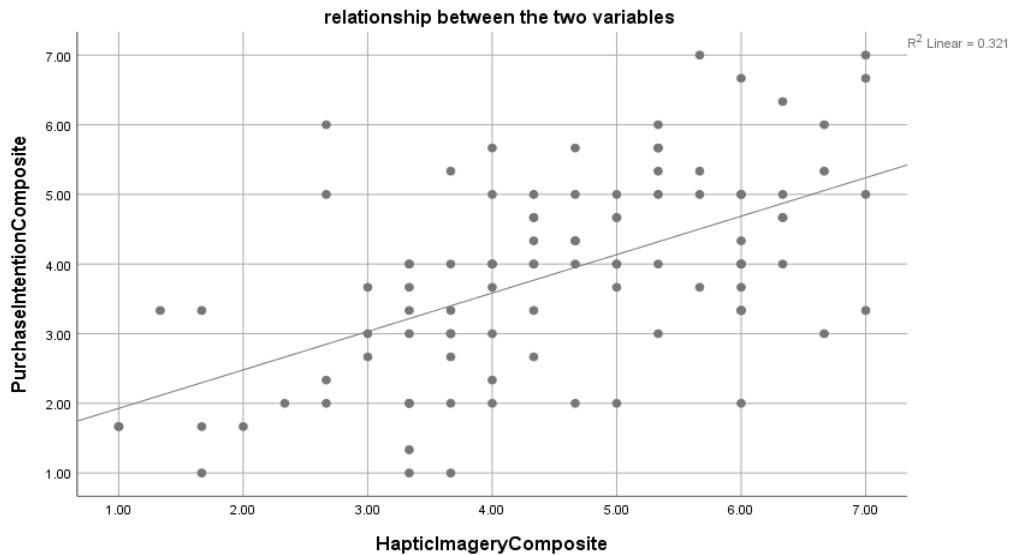
ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.445	1	62.445	44.884	.000 <sup>b</sup>
	Residual	132.167	95	1.391		
	Total	194.612	96			

a. Dependent Variable: PurchaseIntention

b. Predictors: (Constant), HapticImagery

**Table 5.** H2 Regression analysis - ANOVA

This table indicates that the regression model predicts the dependent variable significantly well. Statistical significance of the regression model that was run in this case is  $p < 0.001$ , which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable. Therefore, hypothesis **H2** is confirmed. In addition, coefficients output from the linear analysis suggest that haptic imagery makes a significant contribution ( $p < .001$ ) to purchase intention with a B value of .552 (see Table 5)..



**Figure 5.** Linear regression assumption

In the final step, the regression analysis was implemented to access whether NFT influences the positive effect of the haptic imagery on the purchase decision. The difference from the previous hypothesis testing is that, for the hypothesis H3, the interaction between NFT and haptic imagery is investigated and tested whether this interaction is linked to a specific outcome variable. The coefficients table provides the necessary information to determine whether NFT contributes statistically significantly to the model. Furthermore, the unstandardized B column

provides more insights into this model (see Table 6). The analysis reveal an impact of haptic imagery on the dependant variable as Unstandardized B and Standardized Coefficient Beta are .558 and .572, respectively. For the other two tested variables both coefficients suggest no significant impact on the dependent variable, as well as their p-values. NFT significance is  $p = .979$ , therefore not significant, as well as the interaction between the Haptic imagery and NFT with the  $p = .985$ . Therefore, for the hypothesis **H3** the result is not significant and the hypothesis is not confirmed, hence, haptic imagery always impacts purchase intention positively, irrespectively of individual's NFT.

Coefficients <sup>a</sup>						
Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.336	1.607		.831	.408
	HapticImageryComposite	.558	.351	.572	1.589	.116
	NFTComposite	.008	.320	.006	.027	.979
	HapticImagery x NFT	-.001	.069	-.008	-.018	.985

a. Dependn Variable: PurchaseIntention

**Table 6.** Regression coefficients

## 4.4 Conclusion

In line with the theoretical reasoning, where the importance of the sense of touch in purchase process is highlighted (Abhishek et al., 2014, Hultén, 2020, Jha et al., 2019), the results of the experiment confirm that the exposure to a tactile product description results in stimulation of haptic imagery when compared to a classic product description without haptic clues. Further, research confirms that haptic imagery, that emerge in the previously described process, can have a positive impact on the consumer's purchase intention. Interestingly, findings show that an NFT did not have an influence on the positive effect of haptic imagery on purchase intention. Table 7 outlines the hypothesis testing outcomes and illustrates the approach used for the assessment.

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Hypothesis	Testing method	Result
<b>H1:</b> Haptic product descriptions will stimulate haptic imagery	ANCOVA	Significant → H1 confirmed
<b>H2:</b> Haptic imagery positively impacts purchase intention	Regression analysis	Significant → H2 confirmed
<b>H3:</b> Need for touch influences the positive effect of haptic imagery on purchase intention	Regression analysis	Not significant → H3 rejected

**Table 7.** Hypotheses testing conclusion

After the analysis of the results the next chapter of the thesis will further discuss the results and draw the final conclusions.

## 5 DISCUSSION AND CONCLUSION

As the number of internet users continues to grow and more retailers transition to online platforms, marketers should pay attention to emerging trends and subsequently modify their market strategies. However, online retail can be a difficult environment for known marketing techniques application, especially techniques based on sensory marketing, which has been shown to be very effective in engaging consumers and leading to positive purchase decisions (Hultén et al., 2009; Hultén, 2020; Jiménez-Marín et al., 2019). Furthermore, the changing retail landscape and the associated trend of online retail increase the importance of compensating for the lack of the sense of touch in an online environment.

The overall objective of this research was to gain a deeper understanding of the product description effect on the consumer's purchase decision in an online retail environment. Therefore, exploring tactile product description and the effect of this kind of description on consumers' haptic imaging of the product was of great importance. Finally, in addition, another research focus was the purchase decision and the positive influence of haptic imaging on the purchase decision. Many studies covered the purchase decision of the consumers (Gueorguiev et al., 2016; Peck et al., 2013; Manzano et al., 2016b; Young, 2019), and they all agree that proper understanding and perception of a product are crucial for positive purchase decision making. The sense of touch can have a great effect on the proper perception of the product; therefore, managers should match consumers' expectations and optimize customer involvement by providing the appropriate message in the appropriate way to maximize the perception of the product in an online retail environment. McCabe & Nowlis (2003) argue that one of the biggest challenges for online retailers is that consumers would rather purchase so-called material products, like clothing and fashion, which require touch for better perception, in traditional brick-and-mortar retail stores, so this thesis focuses on possible solutions to address the lack of sensory information in the online retail environment.

To assess and ascertain the answer to the research question and to get closer to the objective of the current thesis, an online experiment has been conducted on a sample of recent online shoppers. The research framework of the study measures constructs such as quality of product information, perceived haptic imagery, and purchase intention. In addition, the need for touch was considered a covariate. The online experiment presented a picture of the product, a unisex hooded sweatshirt, to both the control group and the experimental group. For the experimental group, the product description with tactile cues was displayed, and for the control group, the classic product description without any tactile cues was displayed. As expected, there was a positive relationship between tactile descriptions, haptic imagery, and purchase intention. More specifically, the results of this online experiment confirm the assumption that haptic imaging caused by tactile product descriptions represents a useful means to prompt positive purchase decisions when tactile product descriptions are available on an online retail platform, thereby

confirming the hypotheses H1 and H2. In addition, an analysis of the experiment results shows the influence of an individual's NFT on haptic imaging and subsequent purchase decision. Contrary to what was expected, no significant interaction between NFT, haptic imagery, and purchase intention was found, and hypothesis H3 is therefore rejected. These findings suggest that tactile information helps customers make more accurate product judgments and improves product understanding and perception. Moreover, additional information on a product's haptic characteristics can compensate for the lack of a sense of touch in the online retail environment.

The current research contributes to the existing literature by confirming some of the previous research that has focused on product or service descriptions in different industries; and, in addition, the findings extend to the implementation of sensory marketing strategies in the online clothes retail sector. For example, Kim et al. (2014) observed that in the hospitality industry, the descriptions used in hotel marketing might persuade patrons to imagine beds as more comfortable than they are. Moreover, Lv et al. (2020) argued that haptic cues have a substantial impact on a customer's desire to make a hotel room reservation online. To consider another industry, the so-called "mouthfeel" descriptions of products in the food industry are analysed by Fox et al. (2022), Guinard & Mazzucchelli (1996), and Spence et al. (2013). In addition, a study by Wansink et al. (2005) shows that when consumers were presented with descriptively named dishes, they rated the dishes as more attractive than plain named dishes. The findings in this thesis extend the importance of these kinds of tactile descriptions to the online clothing retail sector. This work also confirms Peck & Childers's (2003b) analysis of how visual sensory stimulation and written description work together to improve the information a consumer receives if they are unable to gain information through touch. As proven by this thesis, sensory stimuli are particularly important throughout the shopping experience (Abhishek et al., 2013; Peck and Childers, 2003a; Peck and Childers, 2003b). Similarly, McCabe & Nowlis (2003) found that in an online environment, material products that require touch for better perception with all the characteristics in the description regarding touch properties were preferred by consumers than the products with descriptions that listed only visual properties. In the same vein, the thesis provides confirmation of Yao et al.'s (2021) assertion that creative text descriptions are usually more persuasive than non-creative ones, particularly in an online setting.

Finally, one of the most important findings of this study is the significance of haptic signals in the purchasing experience. This study shows that information in the description about how the product feels elicits and stimulates higher degrees of haptic imagery. The research shows that evoked haptic imagery eventually impacts purchasing intentions via perceived haptic imagery. Another conclusion is that when customers are unable to touch the object when inspecting clothing, they seek alternative input and receive haptic information by researching information from other sources, ultimately confirming the positive effect of written haptic information on perceived haptic imagery. In this respect, the findings are consistent with earlier research on



consumer behaviour regarding online purchases (Rodrigues et al., 2017), demonstrating that haptic imagery has a beneficial influence on purchase intention (Silva et al., 2020).

## **5.1 Managerial implications**

The next section of this thesis will summarize how the results can be practically applied. In addition, it will suggest actions that should be taken in an effort to compensate for the lack of a sense of touch in the online retail environment. The current study aims at assisting online fashion sellers in compensating for consumers' inability to touch products by incorporating additional verbal haptic information into the online descriptions of the products.

The experiment analysis indicates that participants reported higher levels of haptic imagery in the verbal haptic information ( $M = 4.98$   $SD = 1.43$ ) than in the non-haptic information condition ( $M = 3.98$ ;  $SD = 1.32$ ). These findings not only provide additional support for the relevance of showing verbal haptic information on websites, but they also firmly establish the validity of the findings. In accordance with Rodrigues et al. (2017), the conclusion is that textual haptic information on "how a product feels" to the touch might help generate more sales in the online fashion sector. However, due to consumers' unarguably limited information processing capacity and the short amount of time they spend reading descriptions, online retailers must carefully choose and structure the description next to the product on their website and quickly and precisely focus only on the most tactilely engaging content. In addition, emerging technology may be of great interest to marketers in the future, as it will potentially aid in shaping and sharing the sensory information provided for consumers in the online retail environment.

Contrary to expectations, an individual's need for touch did not make any influence on the consumer's purchase intention of the product. Hence, haptic imagery always influences purchase intention positively, and irrespectively of an individual's need for touch. Therefore, actions are required only insofar as providing a haptic imaging stimulus, and no further actions are required to satisfy an individual's needs for engagement through touch.

Overall, the results suggest that marketers may increase consumers' purchase intention by providing additional cues in the description, and by offering a better overview of the product in the online retail environment. Taken together, these factors may be a powerful combination that leads to satisfying consumers' needs for information, thereby helping consumers gain a better overall perception of the product. However, according to the findings from the experiment, the value of  $R^2$  is 0.321, which indicates that haptic imagery can account for only 32.1% of the variation in purchase intention, and a variety of other factors can still influence purchase intention, even if haptic imagery is being used. Therefore, managers should carefully consider their marketing strategies and continue to consult new research in the field.

## 5.2 Future research

The recommendations for future research may be of great importance to marketers and everyone involved in the fast-changing online retail environment. Firstly, the current research focuses only on one particular product or sector of the authors' choice. Other product categories, such as accessories or other non-material items, may necessitate alternative haptic information elements. Furthermore, future research might explore how tactile and visual information interact with each other to offer firm conclusions about the subject when consumers consider objects with varying haptic qualities, like weight or warmth.

Furthermore, additional studies should be conducted to see whether the current findings can be applied to other sensory qualities that are also lacking in the online environments, such as taste or smell, since the combination of all senses may provide the best results regarding the purchasing intentions of the consumer. Similarly, studying how tactile information interacts with other sensory inputs such as taste and smell, as well as their compensating strategies, would allow marketers and other business professionals insight into better understating the nature of multisensory stimulus in consumers' purchasing behavior. Moreover, additional research regarding emerging technologies and their possibilities for compensating for the lack of sensorial input in online environments is of great interest. Finally, and most surprisingly, current research indicates that NFT is not as significant in influencing haptic imaging and further purchasing intention as initially thought. Some of the past research found significant direct effects of NFT on attitude and purchase intentions in online shopping situations (Citrin et al., 2003; Manzano et al., 2016a), and therefore further research in this area may be necessary in order to understand the significance and role of NFT.

## 5.3 Limitations

As one of the first limitations, the experiment is only about the one product type the author finds suitable. Deeper and wider research is necessary to draw conclusions that will be universal and potentially implemented as a standard or a role model. In addition, cultural differences may influence the purchase decision that this paper is trying to examine (Leo et al., 2005; Pratesi et al., 2021). In addition, many other variables influence the purchase decision in online retailing that the author is trying to measure in the thesis. According to Mican & Sitar-Taut (2020), the most influential ones are trustworthy websites that in addition have product reviews as another important variable. Reliable websites, trust that buyers have in online stores, opinions of other customers, and product prices all can influence the purchase decision (Mican & Sitar-Taut, 2020). Current research is on a fictitious retailing website and in real situations factors such as website quality, easy payment options, and how interactive the website is can make a difference when making a purchase decision. Even participants' attitudes toward the product in the experiment can be additional factors. The work of Suh et al. (2018), makes individuals more familiar with the need for touch (NFT) two levels definition: instrumental and autotelic. The

autotelic factor more relates to the enjoyment aspect of touch and instrumental to the customer's goal-oriented touch. In this matter, not just tangibly describing the product is enough but also the individual's natural predisposition is an important factor when it comes to tactility. In addition, some individuals choose to make online purchases for convenience (Maat & Konings, 2018), others because of the competitive price offered by some e-commerce platforms (Gligorijevic, 2011; Maat & Konings, 2018) so our assumptions of tactile product descriptions contribution may not be valid.

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## APPENDICES

### Appendix 1: Online experiment (tactile product description)

Page 01

Dear participant,

This survey on consumers' perceptions of online retailing is a part of my master thesis research project at the Modul University Vienna. I highly appreciate it if you could spare a few minutes to answer the following questionnaire (3-4 minutes at most).

I guarantee that your answers will remain confidential and will be used for academic purposes only. Please note that your answers should reflect your personal judgment.

Thank you for your input and participation.

Clicking on the "Start" button below would indicate that you have read the information above and that you voluntarily agree to participate.

---

Page 02

1. Have you purchased a product online in the past 24 months?

Yes

---

Page 03

Please consider the next photo and the product description as a part of the online retailing platform where you usually shop online. Please read the product description carefully. The "Next" button will appear after 20 seconds.



- Very soft, smooth material, with thick bracelets providing good grip
- Soft-touch material is comfortable for everyday use
- With a cozy, flexible hood that will keep you warm on colder days
- Polished zip without any sharp edges
- Unisex product completely made of soft cotton
- Fluffy from the inside and firm enough from the outside

## 2. The following statement assesses your evaluation of this particular product description

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree	1	2	3	4	5	6	7	strongly agree
The description provided information about the haptic qualities of the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The description provided information about the tactile qualities of the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The description provided information about how the product feels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 3. The following statements assess your evaluation of this particular product.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree	1	2	3	4	5	6	7	strongly agree
The detailed product information was very helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The detailed product information was very useful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The detailed product information was very informative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 4. The following statements assess your evaluation of this particular product.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree	1	2	3	4	5	6	7	strongly agree
I could imagine moving my fingers on the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I could examine the texture of the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt as if the product was in my hands.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 5. In the following, we are interested in your willingness to purchase the product from the website.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree	1	2	3	4	5	6	7	strongly agree
I definitely intend to buy this product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My purchase interest is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will definitely buy this product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. In this section, we are interested in your habits and behavior when purchasing products in both online and brick-and-mortar retail stores.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree							strongly agree
	1	2	3	4	5	6	7	
I feel more comfortable purchasing a product after physically examining it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
I place more trust in products that can be touched before purchase.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
The only way to make sure a product is worth buying is to actually touch it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
There are many products that I would only buy if I could handle them before purchase .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
When walking through stores, I cannot help touching all kinds of products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Touching products can be fun.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
I like to touch products even if I have no intention of buying them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
I find myself touching all kinds of products in stores.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

7. Please let us know how often do you purchase online within a month

times a month

Age

8. Highest completed education

▾

9. Gender

▾

**Thank you for completing this questionnaire!**

We would like to thank you very much for helping us.

Your answers were transmitted, you may close the browser window or tab now.

## Appendix 2: Online experiment (classic product description)

Page 01

Dear participant,

This survey on consumers' perceptions of online retailing is a part of my master thesis research project at the Modul University Vienna. I highly appreciate it if you could spare a few minutes to answer the following questionnaire (3-4 minutes at most).

I guarantee that your answers will remain confidential and will be used for academic purposes only. Please note that your answers should reflect your personal judgment.

Thank you for your input and participation.

Clicking on the "Start" button below would indicate that you have read the information above and that you voluntarily agree to participate.

---

Page 02

1. Have you purchased a product online in the past 24 months?

- Yes  
 No

---

Page 03

Please consider the next photo and the product description as a part of the online retailing platform where you usually shop online. Please read the product description carefully. The "Next" button will appear after 20 seconds.



- High-quality material, with bracelets providing good grip
- Suitable for everyday use
- With a hood that will keep you warm on colder days
- Zip without any edges
- Unisex product completely made of cotton
- Comfortable inside and stable outside material



2. The following statement assesses your evaluation of this particular product description

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree						strongly agree
	1	2	3	4	5	6	7
The description provided information about the haptic qualities of the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The description provided information about the tactile qualities of the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The description provided information about how the product feels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. The following statements assess your evaluation of this particular product.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree						strongly agree
	1	2	3	4	5	6	7
The detailed product information was very helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The detailed product information was very useful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The detailed product information was very informative.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. The following statements assess your evaluation of this particular product.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree						strongly agree
	1	2	3	4	5	6	7
I could imagine moving my fingers on the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I could examine the texture of the product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt as if the product was in my hands.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. In the following, we are interested in your willingness to purchase the product from the website.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree						strongly agree
	1	2	3	4	5	6	7
I definitely intend to buy this product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My purchase interest is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will definitely buy this product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. In this section, we are interested in your habits and behavior when purchasing products in both online and brick-and-mortar retail stores.

Please indicate the extent you agree/not agree with the following statements.

	strongly disagree							strongly agree
	1	2	3	4	5	6	7	
I feel more comfortable purchasing a product after physically examining it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I place more trust in products that can be touched before purchase.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The only way to make sure a product is worth buying is to actually touch it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are many products that I would only buy if I could handle them before purchase .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When walking through stores, I cannot help touching all kinds of products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Touching products can be fun.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to touch products even if I have no intention of buying them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find myself touching all kinds of products in stores.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Please let us know how often do you purchase online within a month

times a month

Age

8. Highest completed education

▼

9. Gender

▼

**Thank you for completing this questionnaire!**

We would like to thank you very much for helping us.

Your answers were transmitted, you may close the browser window or tab now.