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The role of product form in online purchases

Colophon

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1. Executive Summary

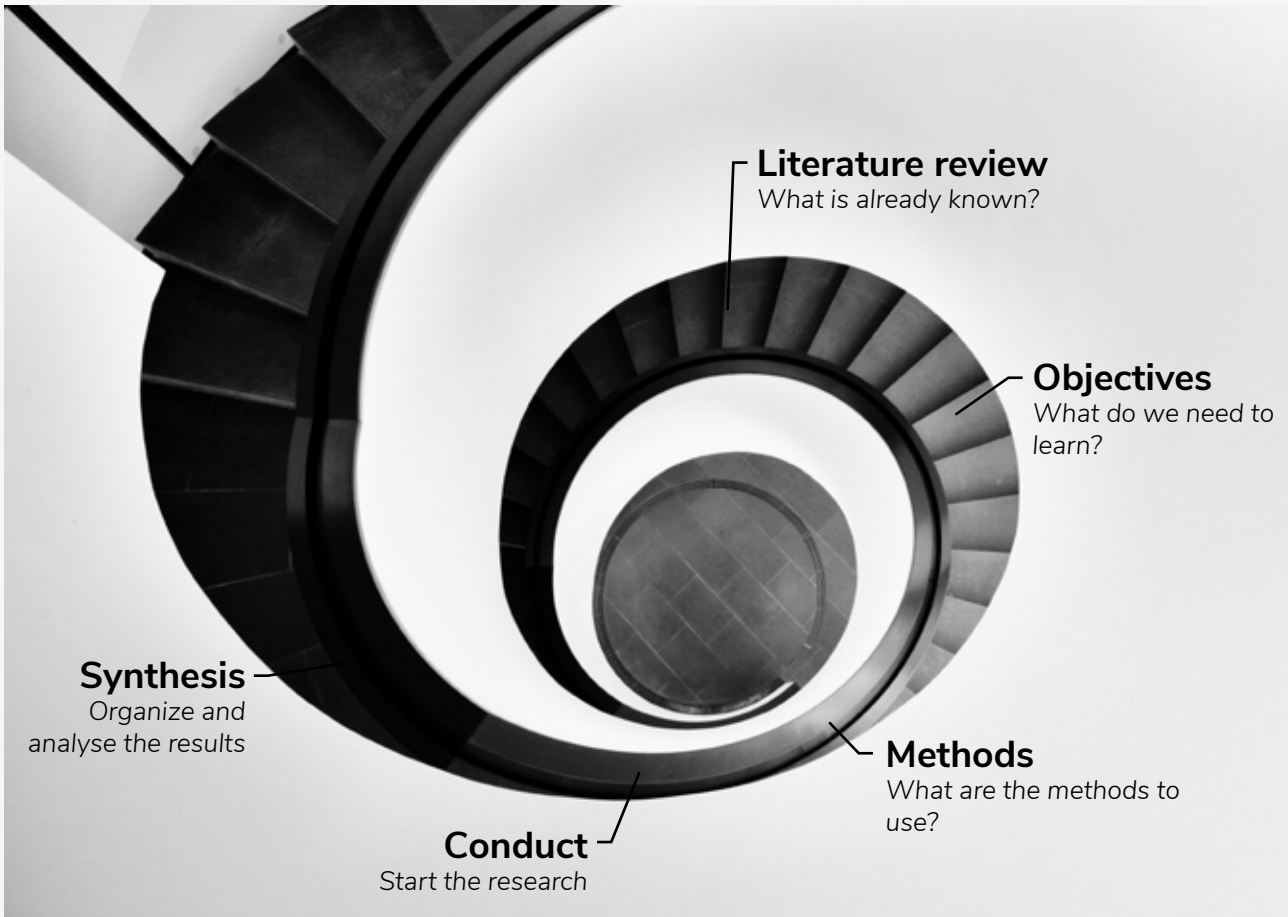


Figure 1 The project process was inspired by the research learning spiral originated by Erin Sander at Frog.

The extended use of internet has digitalized many daily life practices in human life, including shopping, in the 21st century. While consumers used to experience the products mainly in store, now they must base their purchases whatever they see on the screen. Thus, the visual product design directly influences the digital buyers in their product purchases, but how? The earlier studies show that a product's appearance can have aesthetic and symbolic value for consumers,

can communicate functional characteristics and give a quality impression (practical value), and can communicate the ease of use (ergonomic value) (Creusen & Schoormans, 2005). Although these studies explore the role of product appearance or visual product design in consumer purchases, none of them particularly targets online purchases. This study aims to fill this knowledge gap in the literature through qualitative research (figure 1).

The qualitative research, conducted as a part of master graduation assignment (see Appendix A to read the whole assignment), explored whether the different roles of product appearance exist in consumers' process of product evaluation in online environments and to what extent these roles influence the consumers. Also, product related or contextual factors which may potentially have an impact on consumer responses to the product form in the digital environment were researched in the scope of this project. The complete online shopping experience was designed for the participants, and they were asked to perform two simple tasks, purchasing a pair of headphones and a laptop stand through the test website. Later, they were interviewed on their choice reasons for the products. The interviews done with the participation of forty-three subjects was transcribed and coded first, then content analysis was done to learn the frequencies of each concept existing in online shopping practice.

The research findings showed that different roles of product appearance exist in the consumer product evaluation process in digital environments, although the consumer responses to these roles vary for different product categories. For instance, in the experiment, some participants based their purchase on attention drawing value of the product form for a socially significant product category, headphones, whereas this value was not mentioned at all by any of the participants for the other category. Additionally, the influence of some contextual and product factors on the consumer responses to the product form was detected based on the research results. For example, an impact created by in-context images on consumer perception of symbolic value was noticed in the experiment. As a result, this study filled the knowledge gap in the topic "the role of product form in online purchase" as much as the study limitations allow.

2. Introduction

Online shopping has obtained a prominent position in the 21st century as most of the people are busy, loaded with a hectic schedule. In such a situation, online shopping has become a common practice among many people around the world. In 2021, more than 2.14 billion people worldwide are expected to do online shopping, up from almost 1.7 billion digital buyers from all around the world in 2016 (figure 2) (“Worldwide Retail and E-commerce Sales: eMarketer’s Updated Forecast and New E-commerce Estimates for 2016-2021”, 2018). Some consumers prefer to

make online purchases for convenience, others because of the competitive price offered by some e-commerce platforms (“10 retailer investments for an uncertain future”, 2017). In the past, consumers were limited by the product options in the store, whereas now electronic commerce platforms offer the consumers a hundred different product options in different price ranges in a second. In today’s world, shopping became an activity which can even take less than a minute if your credit is saved in your store account. .

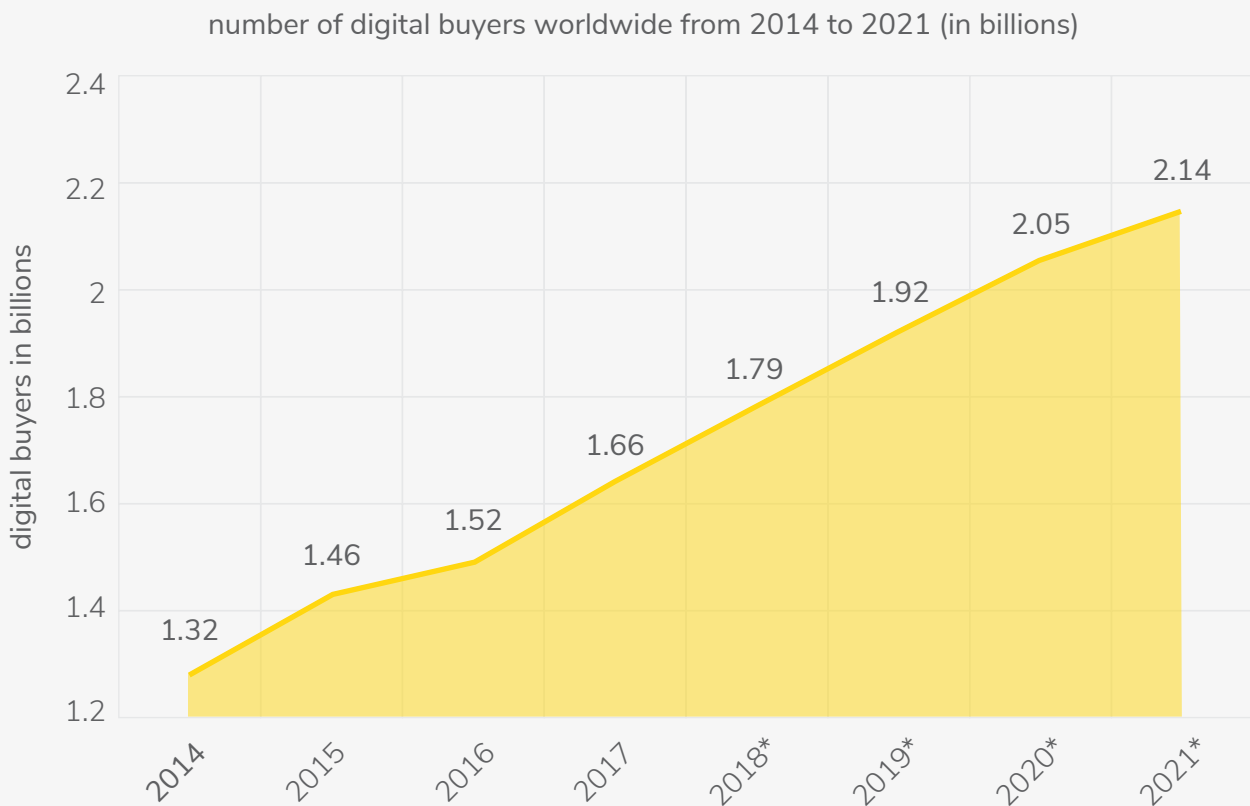


Figure 2 The time line displays a forecast of the number of digital buyers worldwide from 2014 to 2021(“Worldwide Retail and E-commerce Sales: eMarketer’s Updated Forecast and New E-commerce Estimates for 2016—2021”, 2018).

On the other hand, some online buyers have concerns about the authenticity of the products sold online or need of seeing and touching the product before buying, especially as purchasing luxury products (“10 retailer investments for an uncertain future”, 2017). In an online environment, the consumers can have limited experience with the product, unlike a real-life environment where they can use their five senses. In other words, the consumers must rely on whatever they see on the screen as doing online shopping. Therefore, the product appearance plays a significant role in the consumer decision-making process in online shopping practice.

Appearance or form of a product is often the first information that people perceive about a product in e-commerce platforms (Creusen, 2015). A product's appearance that refers to the visual exterior design of a product can have aesthetic and symbolic value for consumers, can communicate functional characteristics and give a quality impression (practical value), and can communicate the ease of use (ergonomic value) (Creusen & Schoormans, 2005). The consumers can value these roles differently as purchasing different products under the effect of different factors like context, time, and culture (Creusen, 2015). There may be even more factors which directly influence the consumer purchasing mechanism in online environments. It is clear that there are many unknowns in this subject,

although online shopping became a daily practice. Thus, it is essential for designers to know the unknowns in consumer purchasing behavior in order not only design better seller product but also understand what the consumer gives value now and in the future. This study aims to offer insights into consumer product form perception in online environments that help in making strategic decisions about the appearance of a product and suggests implications for the practice of new product development.

In order to achieve this aim, the study is organized as follows. First, an overview of consumer response to product form is provided, and the relevant literature on the role of product form in the consumer response in online environments is discussed. Next, the factors influencing consumer product form perception in online environments are investigated. The findings then shape the hypothesis about how product form influences the consumer on online environments and bring up questions to be answered in consumer research. Afterward, the research method aiming to answer the questions and test the hypothesis is defined. Finally, the research result is presented and discussed.

3. Literature review:

the role of product appearance in the consumer purchase decision in digital environments

In this part, the focus is on the role of product form in consumer product evaluation and identification of the factors influencing consumer product form perception in online environments. A mind map, as a visual thinking tool, is created to structure the existing information, make assumptions on the context of the research topic, and connect these assumptions. A couple of keywords come out as an output of the mind map. The keywords such as; “e-commerce,” “product appearance/form,” “product representation,” “consumer behavior” were used in reviewing the literature in scientific databases

including Science Direct, Scopus and Web of Science. The keywords used in this secondary research evolved during the information collection process. Numerous articles were collected, studied, and synthesized. The knowledge gained through the literature was clustered in three main topics: consumer response to product appearance, the role of product appearance on consumer perception: psychological responses of consumers, and factors influencing consumer product appearance evaluation in online environments.

3.1. Consumer response to product appearance

Product design has a more significant impact on our daily lives than any other human-made object like art since we see them every day (Bloch, 1995). A product can influence human perception by only its appearance in a various way. This influence can be recognized in different daily practices, like shopping. Regarding the shopping as practice, the consumer processes different design elements, such as scale, material, geometry individually when contemplating a product for the first time.

Then, the product is analyzed as a whole, and its appearance creates consumer beliefs on its durability, price, function, etc. (Bloch, 1995). Finally, the consumer beliefs or the consumer's psychological responses to the product form, in general, made the consumer show either an approach behavior by showing his/her interest into the product or avoid it (see Bloch's model, figure 3).

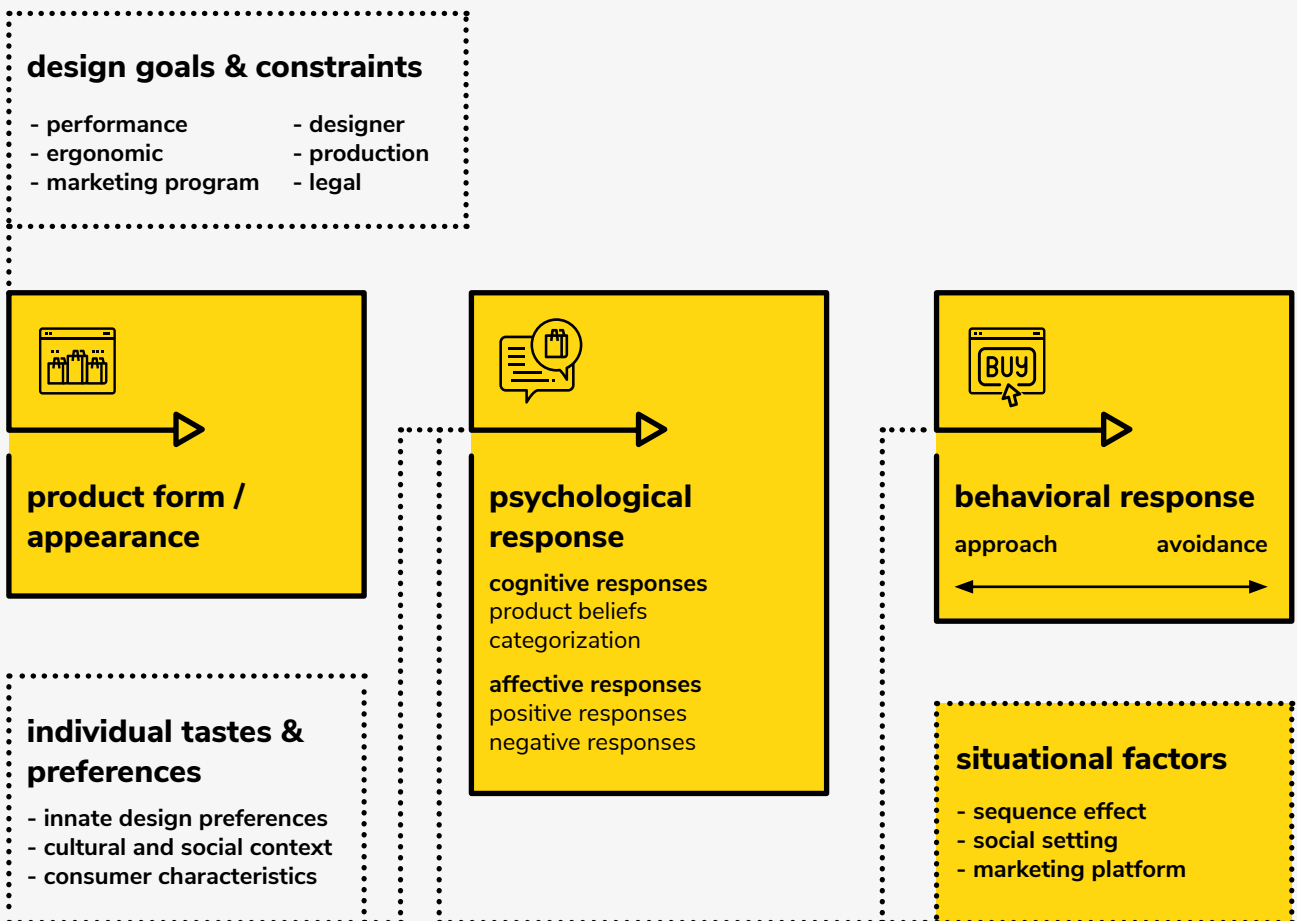
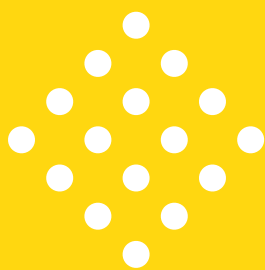


Figure 3 Colored parts of the model created by Peter H. Bloch is further investigated in this research.

The consumer responses to the product form show variety in the type of consumers even though the product is the same. One of the reasons for this variety is that every consumer has a different individual taste and preferences on the product design. Innate design preference is one of the factors shaping individual product form preferences. The innate design preferences acquired early in life make the human react positively or negatively specific visual stimulus instinctively. These preferences are often formalized by Gestalt principles (figure 4) and it is argued that the consumers prefer product designs that follow Gestalt laws of proportion and unity over designs that violate the laws by Veryzer (1993). However, individual product form preferences are not only under the influence of innate design preferences. If it were like that, all consumer's product form preferences would be the same. On the other hand, all consumers have a different characteristic which shaping their unique preferences on the product form. For example, a consumer's experience in the art or design field teaches him/her what to look in a product form.

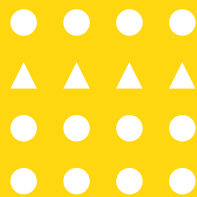
Additionally, design preferences and tastes can be different in different product categories. For instance, a consumer may prefer a black briefcase with a sleek design to look like a professional at work whereas (s)he prefers a big fluffy couch to create a comfortable and cozy environment at home. The preferences show the difference because consumers want to reflect their roles in a socio-cultural environment through their belongings. The individual preferences on the product form have so much to do with the cultural and social context of the consumer.

Furthermore, how the consumer responds to a product form depends on the consumer situation. In the situation that a consumer is performing shopping activity with others, opinions of referents can be a significant influence on the consumer's design appraisals (Solomon, 1983). Thus, the social setting of the shopping activity plays a significant role in consumer response to the product form.



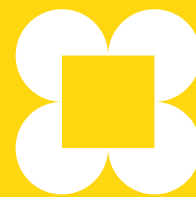
good figure

objects grouped together tend to be perceived as a single figure. Tendency to simplify.



similarity

objects tend to be grouped together if they are similar.



closure

visual connection or continuity between sets of elements which do not actually touch each other in a composition

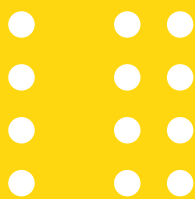
Figure 4 Seven principles of Gestalt, shown in the image created by Valessio in 2003, supports that the human mind perceives patterns in the stimulus based on specific rules.

Beyond the social setting, the setting of the consumer belongings has an impact on the consumer's perception of the product form. The product preference can be moderated by the perceived aesthetic fit of the product with other products the consumer owns, or his or her home interior (Bloch, 1995).

Moreover, the marketing platform is a significant moderator of the consumer response. The way the product is portrayed in an offline or online environment may complement and enhance the consumer's psychological responses to the product form. This is mainly because products often have a symbolic value for the consumers. The consumers can choose a specific product to express their self-image or the image they want to have (Belk, 1988; Landon, 1974; Sirgy, 1982; Solomon, 1983). Therefore, the representation of a product on the images in digital environments has the power of strengthening the ideal self-image illusion. This factor primarily influences the online consumer since they must make a judgment on the product only considering how it is presented in the digital

environment. Therefore, the situational factors are further discussed afterward in this study.

Under the influence of the factors mentioned above, the consumer perceives the product form and give a psychological response. Bloch states that the consumer gives cognitive and affective responses to product form, and the positive affective responses make the consumer reflect an attraction to the product. On the other hand, Creusen and Schoormans support that all kind of psychological responses to the product form can also cause a behavioral response (2005). It is essential to know what kind of psychological responses are given to the product form by the consumer to have a better knowledge of the role of product appearance in the shopping practice.



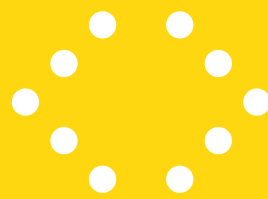
proximity

objects tend to be grouped together if they are close to each other.



continuation

when there is an intersection between two or more objects, people tend to perceive each object as a single one.

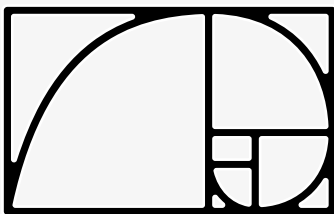


symmetry

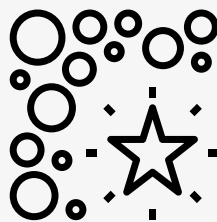
the object tend to be perceived as symmetrical shapes that form around their center.

3.2. The role of product appearance on consumer perception: psychological responses of consumers

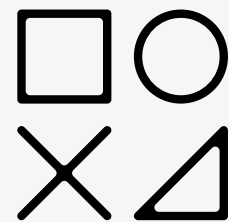
Consumers can give different responses to a product form. Creusen and Schoormans described and clustered these responses as **six roles of product appearance** (2005). They indicate that **a product's form can make the consumers give an aesthetic response or have symbolic value for the consumers, can communicate functional characteristics and give a functional value, can communicate ergonomically, can draw attention and can influence the ease of categorization of the product.** In this chapter, how consumers can perceive these roles in online environments is investigated.



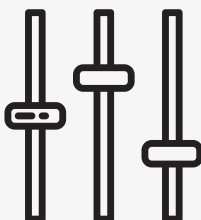
aesthetic role



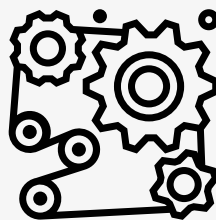
attention drawing role



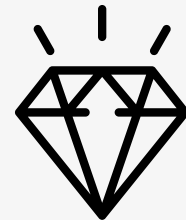
ease of use role



ergonomic role



functional role



symbolic role

3.2.1. Aesthetic value

The product appearance has the power to repel or attract a customer. Aesthetic value is the most mentioned product appearance role as a purchasing reason by customers (Creusen, 2015) and has a high impact on consumer product evaluation mechanism (Creusen & Schoormans, 2005). The products carrying an aesthetic value increase the consumers' reaction times. This means that consumers take consistently longer time to evaluate aesthetic products than standardized one (Reimann, Zaichkowsky, Neuhaus, Bender & Weber, 2010). This may be because the aesthetic value of a product pertains to the pleasure derived from seeing the product, without consideration of utility (Holbrook, 1980). However, this statement may not be true always since the consumers expect the aesthetic products have superior functional attributes than the aesthetically unappealing ones (Han, Wang & Gao, 2016). For example, Coca-Cola's limited-edition bottle design for Olympics in 2012 influenced the consumers with its aesthetically appealing form so much that they even ignore the fact that the capacity of the coke changes from 600ml to 500ml (Han, Wang & Gao, 2016) (figure 5).

Additionally, aesthetic value has a high impact on consumers purchasing decision, especially on durable products. This is because the durable products are often used for many years and visible in the consumers' home or to other people (Creusen & Schoormans, 2005). Also, the consumers consider the aesthetic value of the technological durables more. Since these product's functions degrade or the new

technology brings another function to the market rapidly, the consumer's interest in these product fades out quickly. However, when the product has an appealing appearance, even if its function has been degraded, this product can still get consumers' value (Han, Wang & Gao, 2016) (Bloch, 1995). To sum up, there is often a practical reason behind the consumer's aesthetic concern on the product form. When we consider that fact that electronics are the most purchased durable product in online environments (10 retailer investments for an uncertain future, 2017), we can assume that the aesthetic value of a product form influences the many online shoppers' product evaluation processes.



Figure 5 Coca Cola's design for 2012 Olympics in London.

3.2.2. Attention drawing value

A product having a different appearance than the products in the same category can catch consumers' attention (Creusen & Schoormans, 2005). Garber emphasizes that visual effect the visual noticeability of a product is relative to a background comprised of competitor alternatives in the same product category (1995). However, product categorizations show so much variety in e-commerce platforms. Recommendation agents embed in many e-commerce platforms show different categories in which the searched product to the consumer based on previous the consumer's previous purchases, search or purchases of the other consumers having similar interests (figure 6). Therefore, the way that a product form catches the attention of consumers in the online platform is different than how it is in the physical store.

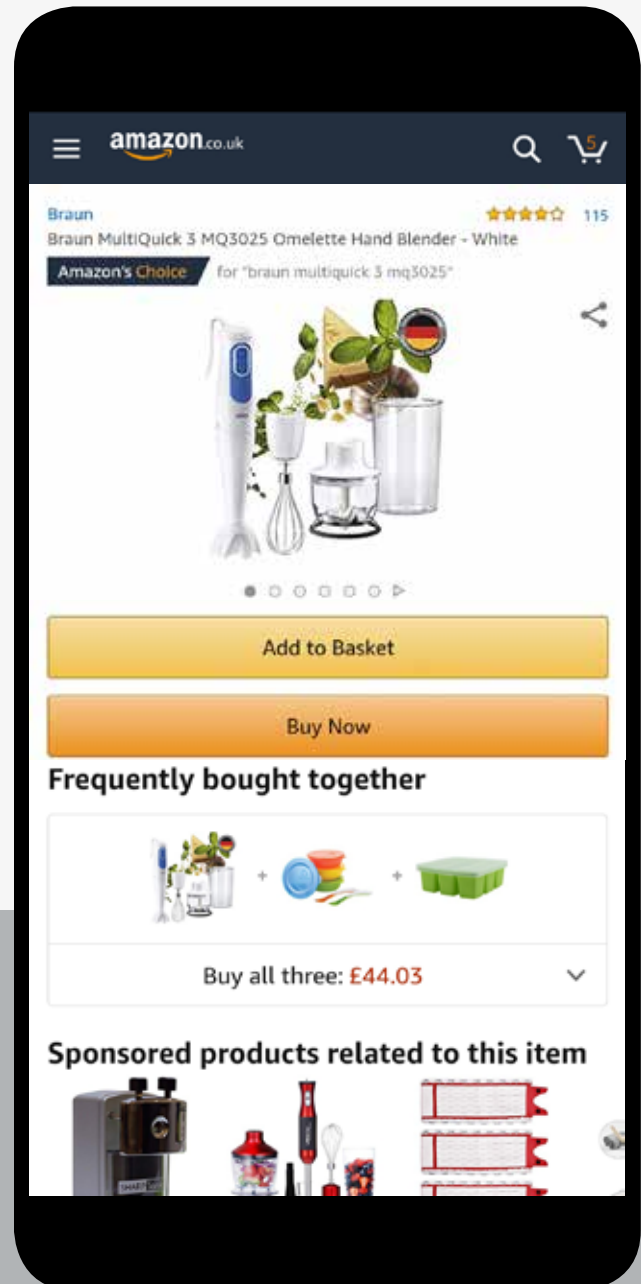


Figure 6 Amazon's recommendation agent offers different product alternatives to the customers.

3.2.3. Ease of categorization value

Ease of categorization of a product form is an appealing feature, especially for low-involvement products like toilet papers since the consumers want to minimize their product evaluation effort (Hoyer, 1984). For example, vegetarian products are designed in a similar way of meat products so that they can be seen as an alternative to the meat products (Creusen, 2015). On the other hand, an atypical appearance can sometimes be a desired product feature, although it makes the product categorization harder. An

atypical appearance of a product can make the consumers pay much attention to the product as a whole especially when there are some many competitors in the product category, or the product is newly released one (Creusen, 2015). Also, a typical product appearance can mislead the consumers in e-commerce platforms because there are so many fake products available on these platforms. These products are often low in quality but look similar to high-quality ones in the same category (figure 7).

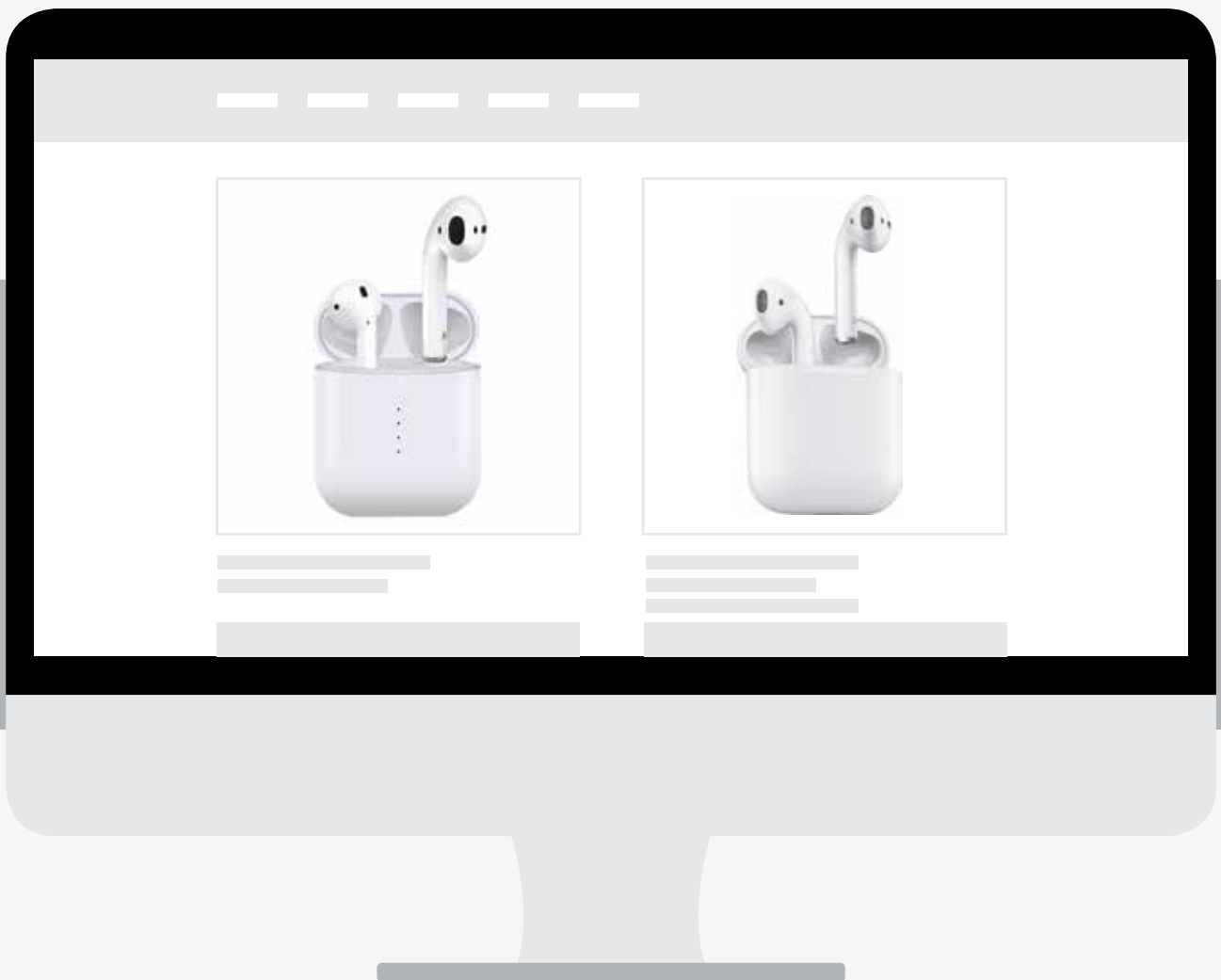


Figure 7 TWS(left) and Apple air pods (right) have a very similar product form, and both are available on bol.com.

3.2.4. Ergonomic value

Consumers can have an impression pertaining ergonomics of a product by the product appearance (e.g., Norman, 1988). For instance, the holes in a pair of scissors tell consumers how to use it by showing where to place their fingers and how to use it (Bloch, 1995). Moreover, consumers may perceive the upright-shaped product as an unstable product at first sight, although the product is designed in a way that it cannot fall in regular use (Creusen & Schoormans,

2005). This product perception may make the consumer discard the product, so the first impression on the ergonomic value of the product from can influence the consumers' product evaluation process directly especially in the online environments where the consumer cannot experience the products. In digital environments, the consumer must rely mostly on the modality of vision as judging the ergonomic values of the product form.

3.2.4. Functional value



Figure 8 Consumers may infer on first sight that a larger hairdryer has more power than a smaller one (Creusen, 2015).

A product's appearance can tell about the functional qualities of the products. For example, a product with a few buttons may look simple or easy to operate, while many buttons seem to indicate many functionalities (Creusen, 2015). The appearance of a product can be a cue for haptic qualities of the product, although the cue misleads the consumer, especially in digital shopping environments. Presentation of a product may represent the functional features,

such as weight, size, etc., of the product illusively, like the example shown below (Creusen & Schoormans, 2005) (figure 8). Therefore, product representation in online shopping platform influence how consumers perceive the functional value of a product since almost half of the online consumers evaluates the overall scale and size of a product from its product images (E-commerce Usability: Product Page, 2017).

3.2.6. Symbolic value

The symbolic value of a product appearance influences the consumer evaluation of the product because the people often choose a product or a brand to express themselves or the person they want to be (Creusen & Schoormans, 2005). In other words, consumers purchase the product which can look like them, such as serious, childish, or feminine (Creusen, 2005). For example, the design objects colored with the primary colors like red, blue, and yellow can be perceived as childish, whereas they can also seem like a product of

De Stijl art movement. The symbolic value of a product form can be perceived differently by the consumers since the meaning of forms and colors may change in time, as meanings are continuously transformed by movements in art, fashion, etc. (Muller, 2001). The advertisements can support the symbolic value of a product form. Especially in e-commerce platforms, the product images in the context perhaps promote the way the consumer perceives the symbolic value of the product forms (figure 9).

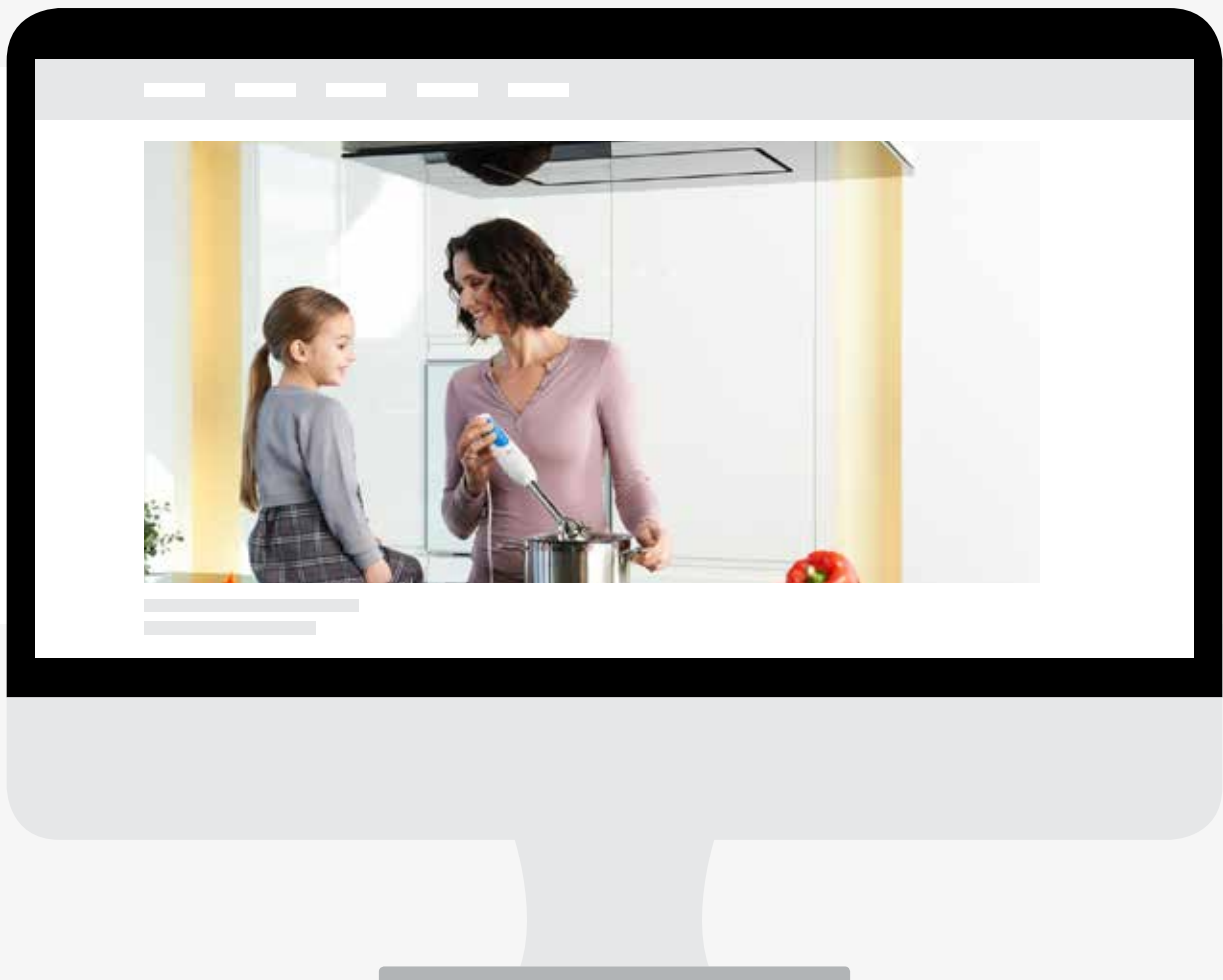
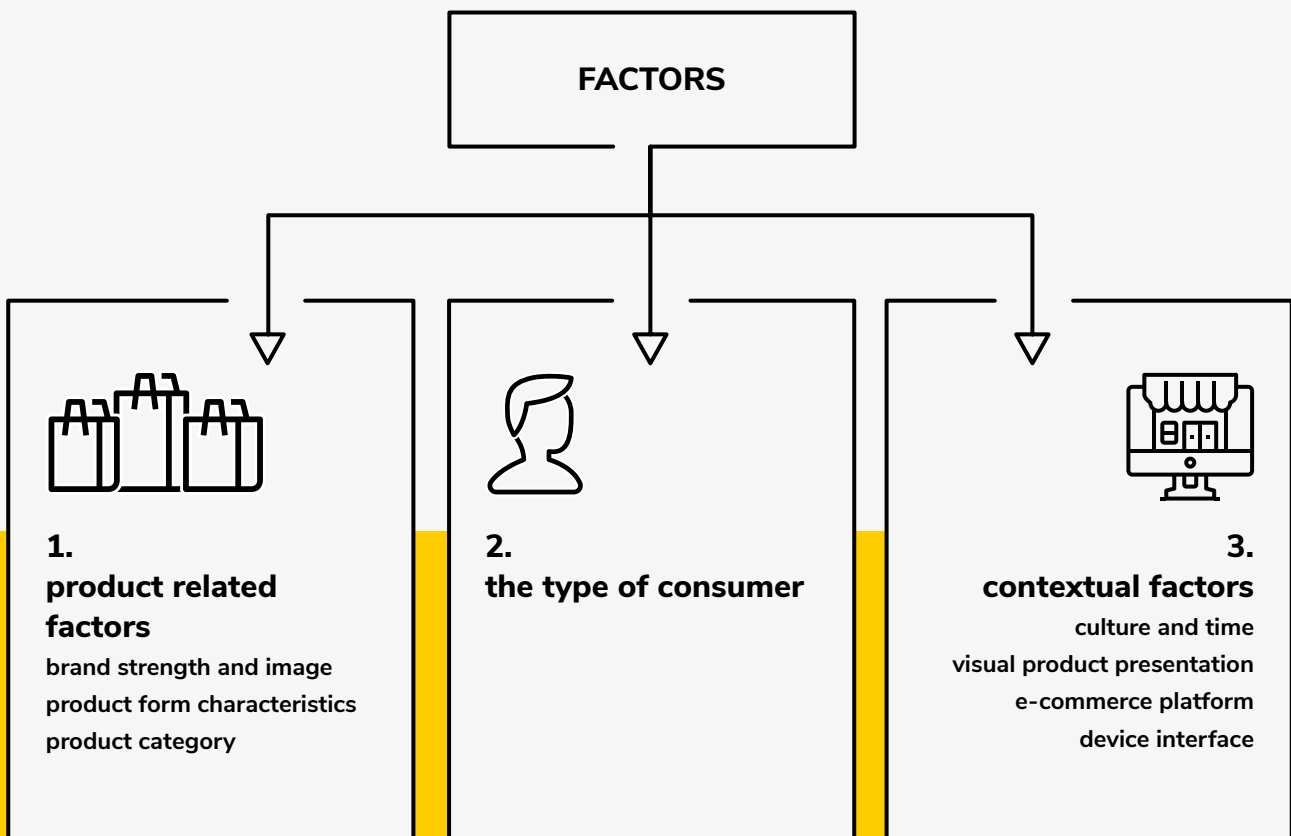


Figure 9 In-scale image of Braun MultiQuick 3 hand blender on Amazon.uk promotes the symbolic value of the product form.

3.3. Factors influencing consumer responses in digital environments

The consumer's shopping behavior in online stores can be fundamentally different from the one in physical stores (Alba et al. 1997; Winer et al. 1997). Also, the way that the consumer perceives and responds to the product form shows differences in **different shopping channels**. Therefore, it is vital to understand the factors affecting the consumers' response to product appearances, such as **product-related factors, the type of consumer, and contextual factors**.



3.3.1. Product related factors

3.3.1.1. Brand strength and image

Product brands can allow consumers to express their identity and their differences from other people better, and they often pertain to the symbolic value of a product appearance (Fischer, Völckner & Sattler, 2010). Therefore, brands have often more influence on the consumers as evaluating the appearance of socially significant products (Fischer, Völckner & Sattler, 2010). However, influence space of the brands can extend in the online shopping platforms, because product's brand serves a vital signal to reduce perceived risk, one of the consumer concerns frequently seen in online shopping practice (Fischer, Völckner & Sattler, 2010). Consumers tend to adopt the strategy of buying a well-known brand image in order to cope with the perceived risk as shopping durables that are often expensive and used to demonstrate the social status of the owner (Fischer, Völckner & Sattler, 2010).

On the other hand, Klink and Smith argue that online shopping environments reduce the importance of brands as purchasing decision criteria because consumers can quickly collect and evaluate product information from various sources online (2001).

However, consumers often have a limited capacity to evaluate and memorize product information (Bettman, Luce, and Payne 1998), and this situation leads them to prefer the products with a sharp brand image. The strong brand image influences the consumers especially as purchasing electronic product categories, where the frequency of new product introductions is high, and the technology used is hard to understand for many consumers (Fischer, Völckner & Sattler, 2010). As a result, the products capable of reflecting their brand strength visually can influence consumer perception positively in



3.3.1.2. Product form characteristics

Product form characteristic influences the consumer's psychological response to product appearance in different ways. For instance, people see value aesthetically in the products forms having low complexity, high symmetry, great unity, and right proportions (Creusen & Schoormans, 2005). Also, novel or atypical designs decrease the functional and ergonomic value of the product appearance according to consumer perception (Mugge & Schoormans, 2012a, 2012b). Furthermore, the consumers' response to large shapes as powerful and strong, while small shapes appear delicate and weak for them (Walker, Francis, & Walker, 2010).

However, the perception of size is a problematic issue in e-commerce platforms. Although there are product representation standards set by some e-commerce websites, like Amazon or eBay, still 28% of the sites do not provide any "In Scale" images" (see figure 10) among their product images (E-commerce Usability: Product Page, 2017). This situation leads the consumers to give wrong decisions on functional and ergonomic values of the product's appearance in digital shopping environments where the products are assessed within 90 seconds, and a quick initial judgment is made whether to make a purchase or not (Walker, 2017).

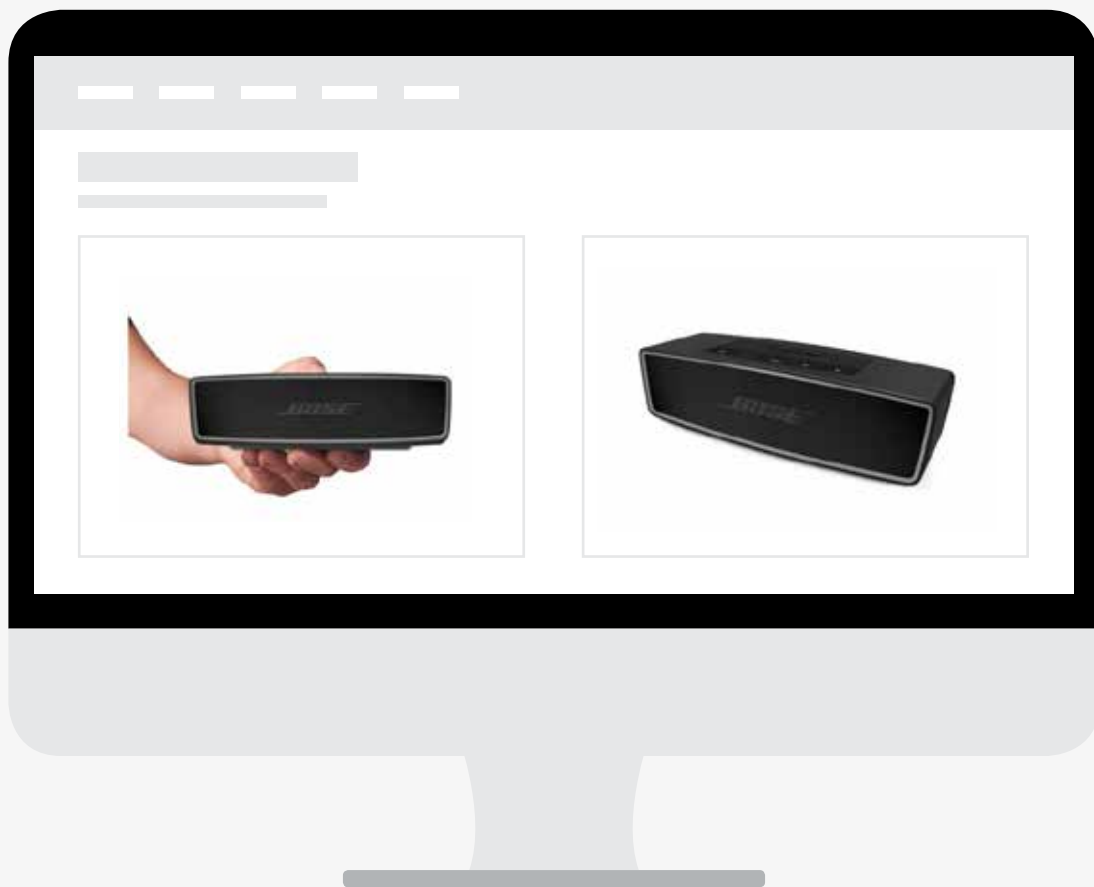


Figure 10 The Bose speaker is perceived heavier in cut out image than in scale image ("Product Page UX: All Products Need At least One 'In Scale' Image (28% Get It Wrong)", 2019).

3.3.1.2. Product form characteristics



Figure 11 The graphic shows online or offline shopping preferences for selected product categories by the consumers in 2017(10 retailer investments for an uncertain future, 2017).

Holiday packages, books, and airline tickets are the most popular products and services purchased over the internet by consumers. The availability of information on these products is shown as a reason to purchase online (Dhanapal, Vashu & Subramaniam, 2015). Another reason can be that the consumers can purchase hedonic products online without missing any offline channel attributes like a physical store or physical product display (Shen, Cai & Guo, 2016). In the evaluation of the hedonic product, sensory enjoyment is essential to consumers (Creusen, 2015), so consumers may expect a higher aesthetical value from the hedonic product form

in online platforms. The most recent research shows that after books, consumer electronics and computers are the most purchased product category in digital environments (10 retailer investments for an uncertain future, 2017). The popularity of electronics and computers among the online shoppers may be explained with the fact that product variety and uniqueness are two crucial factors that drive consumers to shop online (Quinn, 1999; Sim & Koi, 2002) (Shen, Cai & Guo, 2016). Therefore, it may be assumed that the symbolic value of a product form may influence the consumer's product evaluation process in digital platforms.

3.3.2. The type of consumer

The value impression communicated through the appearance of a product can influence the different type of consumers in different ways (Dhanapal, Vashu & Subramaniam, 2015). Today, roughly 10 percent of the world's population have shopped online at least once (Jhe, 2014), and this population varies in age, gender, income, and characteristics. Regarding gender, Creusen's study argues that female consumers give higher importance to the aesthetic and symbolic value of the product appearance than male ones (2010). Also, they prefer easy to use products with many functionalities compare to males (Creusen, 2015).

On the other hand, younger consumers seem to give value to expressive product aspects while ease of use and quality of a product is influential for old ones (Creusen, 2015). Although gender and age appear as strong factors explaining the differences in shopping behaviors and perception

of products, this is not the case in digital environments (Wan, Nakayama & Sutcliffe, 2009). Results of the consumer study conducted in 2015 show that there is not much behavioral difference according to gender with regards to purchasing online (Dhanapal, Vashu & Subramaniam, 2015). In respect of age, young users' high technology skills and old users' shopping experience influence their shopping behaviors in similar ways (Dhanapal, Vashu & Subramaniam, 2015). What influences consumers' purchasing behavior is their income level and shopping motivation in online environments, regardless of age and gender (Wan, Nakayama & Sutcliffe, 2009) (Dhanapal, Vashu & Subramaniam, 2015) (Fronimos & Kourouthanassis, 2015).

In the studies of Hernandez, Jimenez, and Martin (2011), consumers having high income perceive less risk in online purchasing compare to ones



limited income. Since the high-income consumers can withstand possible financial losses, they feel freer as shopping online and purchase more items in the digital environments (Dhanapal, Vashu & Subramaniam, 2015). Additionally, shopping motivation of the consumers creates a significant effect on their behaviors in e-commerce platforms. E-commerce platforms create an opportunity for consumers to undertake roles that would not traditionally take due to anonymity constraints. Also, it provides different product information, including new trends, brands, or technology, and allows consumers to escape from reality by removing the physical barriers (Fronimos & Kourouthanassis, 2015). These features of online shopping catch the attention of the apathetic shopper who wants to minimize every shopping related effort, and convenience shoppers seeking for convenience in all aspects of shopping (Fronimos & Kourouthanassis, 2015). These

types of consumers, the most prevalently seen in digital environments, enjoy sophisticated product recommendations and product image interactivity as shopping (Fronimos & Kourouthanassis, 2015). The product appearance is a valuable factor for shopping behavior of these consumers since they desire to see all different products and all the different visual details they have.

On the other hand, online shopping is not an enjoyable activity for traditional consumers. This type of consumer is often price oriented and values social relationships in shopping practice. However, social interactions, including bargaining or serving, do not exist in digital environments, so traditional shoppers are not often visible in these environments.



3.3.3. Contextual factors

The environment where products are displayed influence consumer's response to the product form. Bloch states that a matching environment can emphasize the aesthetic value of a product (1995) by making the product look its best. On the other hand, a pale product may look attractive to consumers in an environment full of bright colors, although bright colors were supposed to catch consumers attention a lot (Creusen & Schoormans, 2005). Therefore, the way the product is represented, and the context of it determines how it is perceived by the consumers a lot.

3.3.3.1. Visual product representation

Representation way of a product can alter consumers' response to the product form. In the research done in 2017, more than 90% of the participants showed product visuals as the top influential factor affecting their purchase decision in online environments (Walker, 2017). Offering multiple product images from different views leads to a %58 increase in online sales regardless of the product category (Walker, 2017). However, for products that more depend on their look, mainly hedonic products, the product visuals are even more critical for consumers to evaluate product appearance better (Di, Sundaresan, Poramuthu & Bhardwaj, 2014). Also, the consumers desire to see the more and high quality of images, especially in the electronic product categories (Di, Sundaresan, Poramuthu & Bhardwaj, 2014).

The reason for this desire is appealing product appearance is an outstanding feature in competitive product categories like electronics. On the other hand, product image interactivity has an impact on consumers' response to product form as it provides a simulation of actual product experience to consumers according to the research done on low-involvement products, like groceries (see figure 10) (De Vries, Jager, Tijssen, & Zandstra, 2018). With image interactivity technology, consumers can view or alter a product's design features, background, context, viewing angle or distance so that the consumer can evaluate the product appearance better (Fiore, Kim & Lee, 2005).

In e-commerce platforms, consumer decisions rest purely on the product descriptions and pictures provided (Di, Sundaresan, Poramuthu & Bhardwaj, 2014). Additionally, one-quarter of product returns are caused by misleading product images. Therefore, clear and detailed pictures of the products also help consumers to reduce perceived risk associated with online purchasing (Di, Sundaresan, Poramuthu & Bhardwaj, 2014) and allow them to evaluate products a logical way.

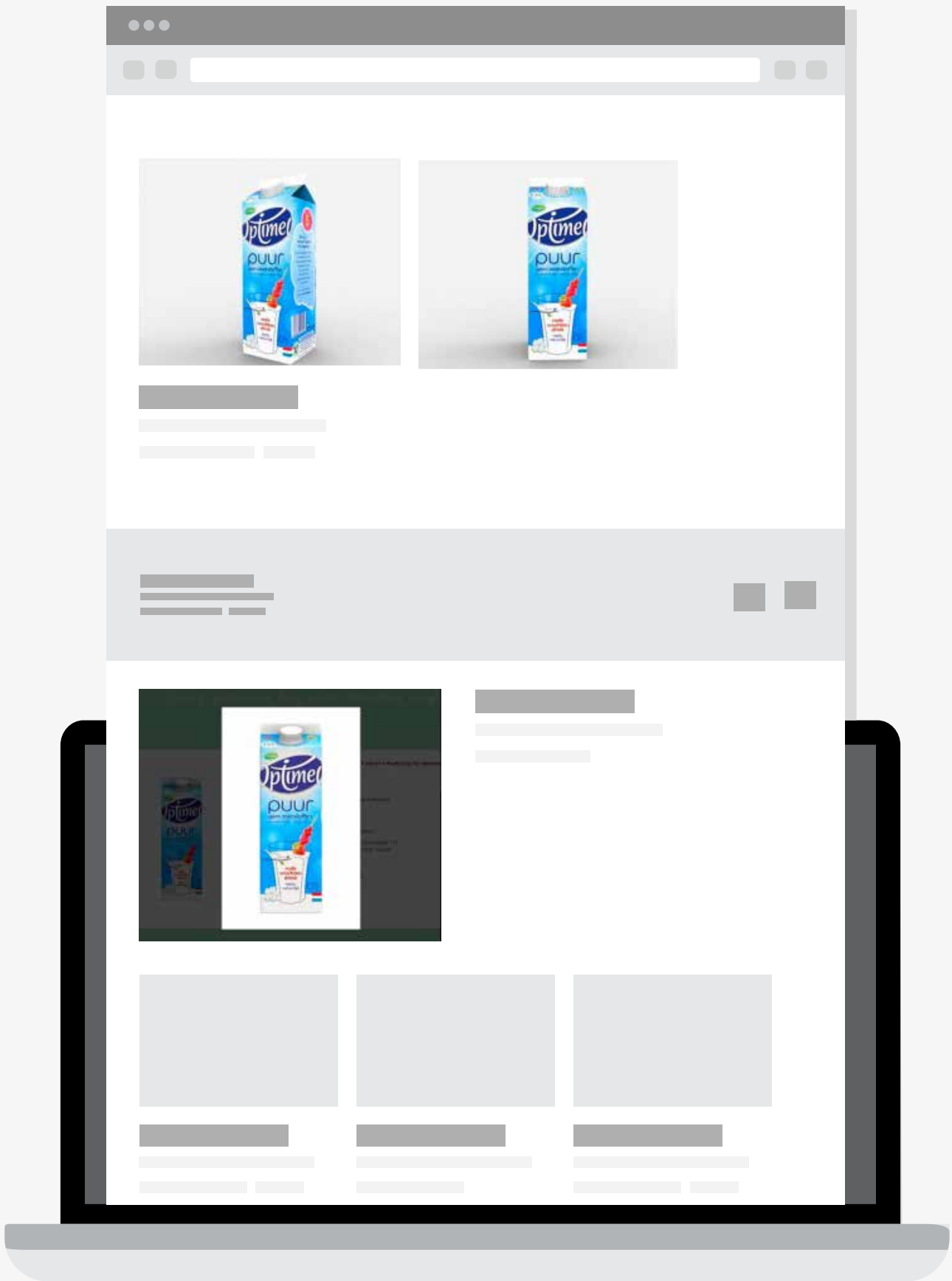


Figure 12 Example of the low interactivity(bottom) and the high interactivity(right) condition of the Optimel yogurt drink (De Vries, R., Jager, G., Tijssen, I., & Zandstra, E. H., 2018).

3.3.3.2. E-commerce platform

In online retail environments, consumers often need to evaluate visual attributes of the products according to product-extrinsic features, including price, brand, and reliability of the store since they are not able to use their sense of touch (Overmars & Poels, 2015). On the other hand, product design can have so many multisensory attributes, like the feeling of the soft but cool touch of a silk scarf, light aluminum barrel, or intense color of a permanent marker (Overmars & Poels, 2015). This attribute influences consumers with high autotelic NFT (need for touch) as perceiving the products, especially the ones appearing soft or smooth, or having a sleek design. However, highly interactive online shopping platforms can help the consumers who need to engage in exploratory touch with the product to perceive aesthetic, functional and ergonomic values of its appearance (Overmars & Poels, 2015). As a result, e-commerce platforms play a significant role in consumers as an evaluation of the products. They can sometimes take the salesperson role by providing the consumers with information through the visual display as well as by suggestive selling since it is not possible for consumers to have a face to face interaction with the seller in digital environments (Weiling, Huang & Zhang, 2018). Also, the visual display of online shopping platforms can have a significant effect on product evaluation. For example, product evaluation under neat display was significantly higher than the product evaluation under a messy display (Weiling, Huang & Zhang, 2018). Thus, the e-commerce platform is considered as a factor influencing consumers' response to product form.

3.3.3.4. Culture and Time

Products allow people to reflect themselves visually like other culturally specified other categories, such as art or fashion design (Mccracken, 1986). Therefore, the influence of culture and time can be usually detected in the consumers' aesthetic and symbolic product preferences (Creusen, 2015). Impact of culture and time can be visible in the appearance of a product. For example, products designed in the guidance of disharmony principles convey punk aesthetic value to consumers.

3.3.3.3. Device interface

Consumer behavior in an online environment is affected by the degree and type of device interactivity that is used for shopping. The device interface can strongly influence to consumers as exploring, perceiving, remembering, and acting on the context where the product exists (Brasel & Gips, 2015). According to the survey in 2017, while in-store shopping is still most popular with weekly and daily shoppers, the frequency of online shopping has now overtaken devices having a direct touch interface, like tablets and smart phones (see figure 13, on the next page) (10 retailer investments for an uncertain future, 2017). This change in the device used for the shopping activity can affect consumers' product perception because of interface interaction difference between computers and tablet or mobile phones.

Tablets or mobile phones owning direct-touch interfaces can create a direct visual metaphor of touching an object in the real world, whereas pc that is controlled with a touchpad or mouse having indirect touch are not able to do so (Brasel & Gips, 2015). Therefore, direct touch interfaces can help consumers to gather material product information (substance properties), such as texture, roughness, hardness, weight, temperature, or part (i.e., the separate parts of the object)

(McCabe & Nowlis, 2003). Also, consumers tend to mention the tangible properties of a product as purchasing a product online through a direct touch interface (Brasel & Gips, 2015). However, direct touch interfaces may not always be required to evaluate a product, especially if the product is a geometric object which most dominant attribute is size or shape (McCabe & Nowlis, 2003). This is because the only sense of vision can successfully recognize the geometric products.

usage of shopping channels over time

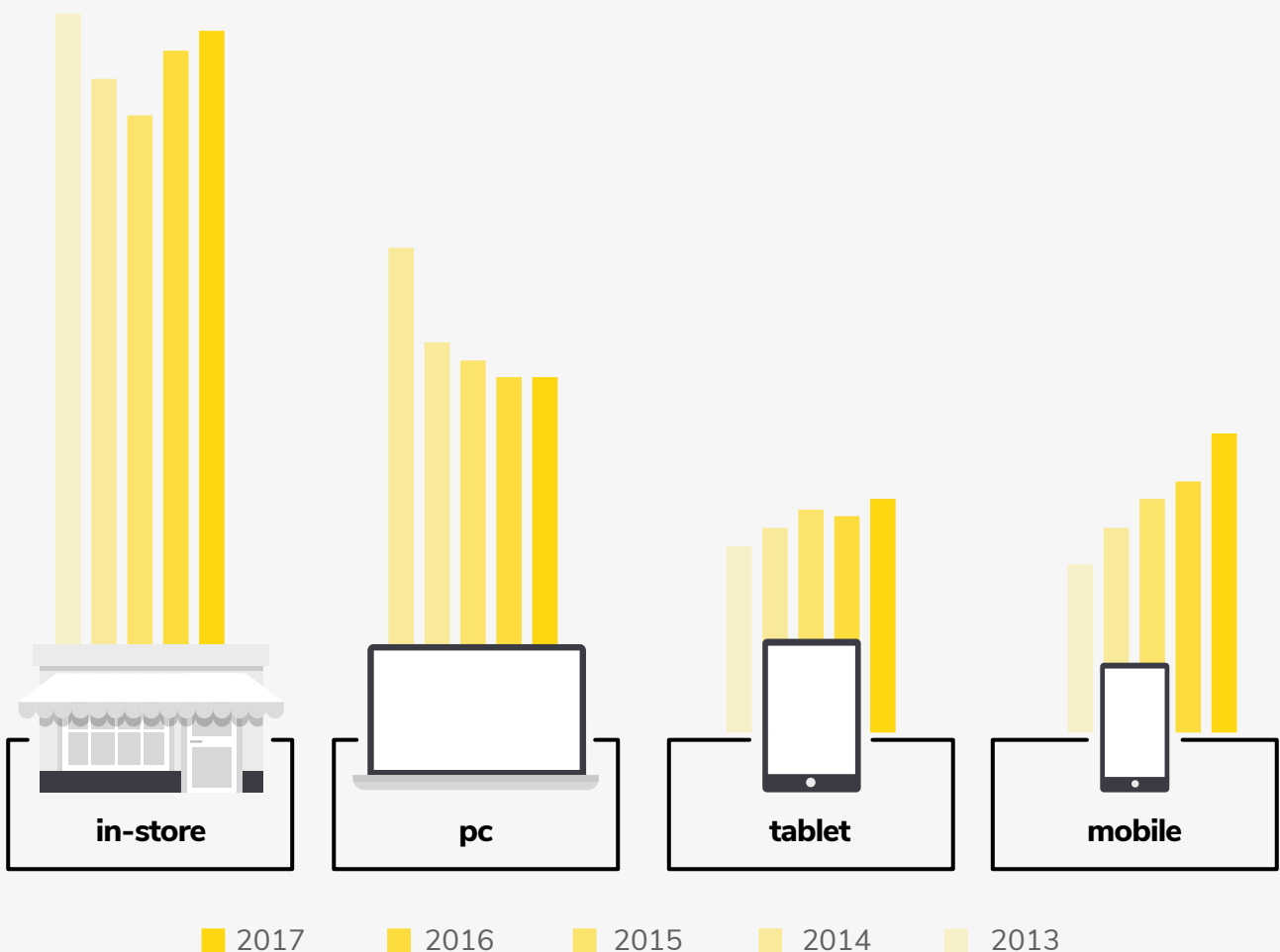


Figure 13 There is an increase in tablet and smart phone use for online shopping (10 retailer investments for an uncertain future, 2017)

4. Research Questions

In the literature review, consumer response to product form in digital environments is discussed, and the potential factors influencing the consumer response is investigated. However, there is still a knowledge gap in the role of product appearance in the consumer purchase evolution in e-commerce since the literature mainly focuses on the consumer decision mechanism in store contexts. This qualitative research aims to fill this knowledge gap in online shopping environments and specifically find out;

→ **RQ 1** Whether the different roles of product appearance exist in consumers' process of product evaluation in online environments.

→ **RQ 2** To what extent these roles influence consumer product evaluation in online environments.

→ **RQ 3** Whether there are factors, like product related or contextual, influencing the consumer response to the product form in digital environments.

→ **RQ 4** How these factors influence consumer' response to the product form in digital environments.

Because of limited time and resources, the research questions are kept not too broad. For example, although more factors having a potential influence on consumer responses in digital environments are mentioned earlier in the literature review, not all of them, like consumer type related factors, are addressed in the research

questions. Also, based on the literature review, a map showing researcher's assumptions on consumers responses to product form in current online environments was created. This map gave some sort of guidance as designing the research, but the research wasn't designed to test the researcher's assumptions.

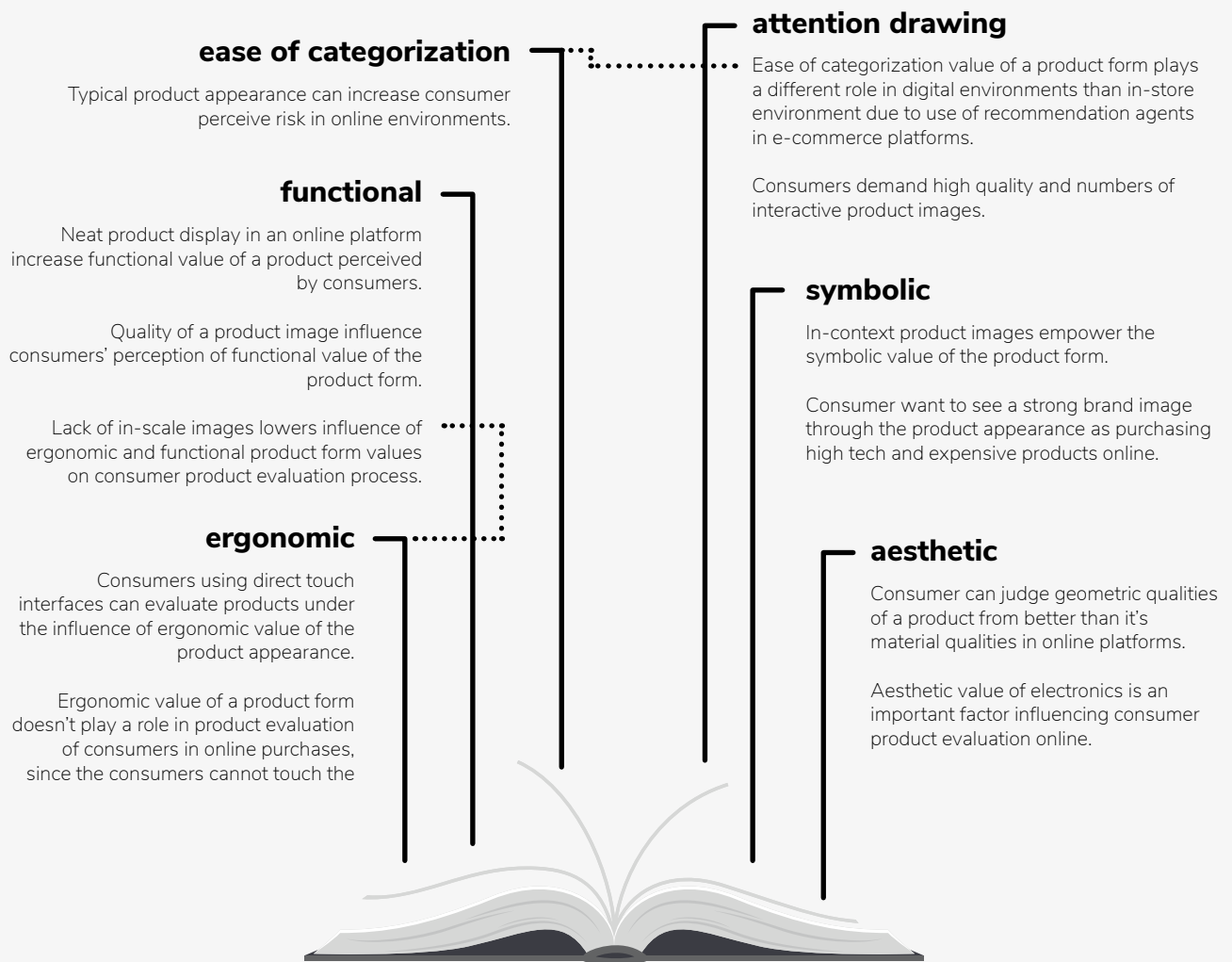


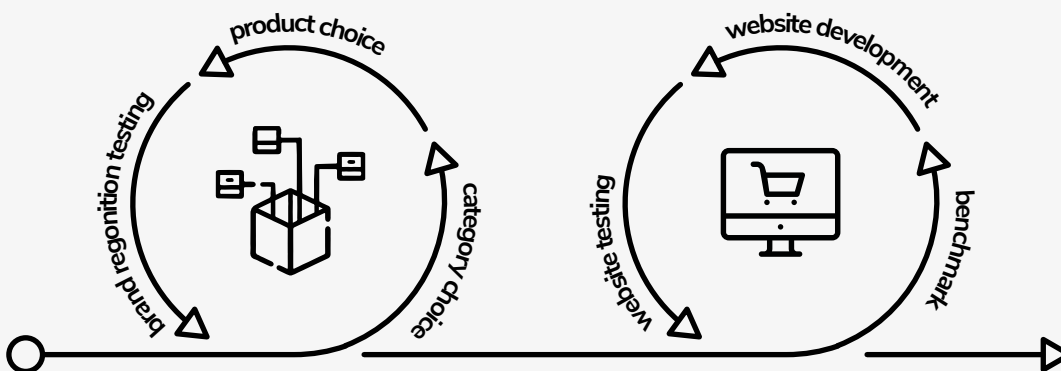
Figure 14 The map shows the researcher's assumptions on the consumers responses to product form in the current online environments based on the literature review.

5. Method

Experimental qualitative research was conducted to answer the research questions and test the hypothesis. Additionally, the research was designed in a way that the results can create a reasonable basis for comparison between consumer responses to material/geometric, socially significant/non-socially significant, hedonic/utilitarian, electronic/non-electronic product categories, as well as better test the hypothesized.

5.1. Research instrument design

The consumer's shopping behavior in online stores can be fundamentally different from the one in physical stores (Alba et al. 1997; Winer et al. 1997). Also, the way that the consumer perceives and responds to the product form shows differences in **different shopping channels**. Therefore, it is vital to understand the factors affecting the consumers' response to product appearances, such as **product-related factors, the type of consumer, and contextual factors**.



5.1.1. Stimuli design

5.1.1.1. Product choice

In order to create a realistic experiment setting for the research, an online shopping website, including several products, was developed. First, product categories were chosen in a way each of them can represent either material/geometric, socially significant/non-socially significant, hedonic/utilitarian, electronic/non-electronic products (figure 15). These variations in the categories were desired since the assumptions based on the literature review argued that consumers approach in diverging ways to products having different form attributes, namely

material or geometric, or from different categories, such as electronics, or socially significance of the product. For example, it was assumed that geometric products might be better recognized by the consumers rather than the material ones based on McCabe and Nowlis study in 2003. On the other hand, electronic products were expected to require more aesthetical concerns from the consumers than the other product categories by considering what earlier studies say (Han, Wang & Gao, 2016) (Bloch, 1995).

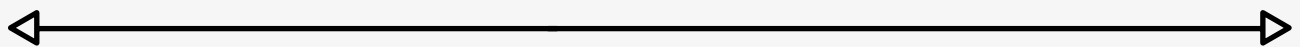


Material object

(dominant attributes; texture, roughness, hardness, weight, temperature, or part)

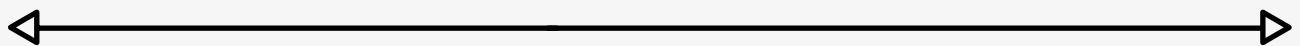
Geometric object

(dominant attributes; shape and size)



Socially significant

Not socially significant



Expressive

Utilitarian



Electronic

Non-electronic



Two product categories, which can create the variation the best, were chosen as headphones and laptop stands. It was thought that headphones could represent electronic products which are socially significant, material, both expressive and utilitarian, whereas laptop stand can stand for products geometric, utilitarian, and non-socially significant product. For each product category, nine different products available in the market were chosen. As choosing the products, brand image, and familiarity of the products were considered. The ones which are significantly popular or expressing the brand image actively were not chosen initially on purpose because any influence of the brand on the consumer was not wanted in the test. Also, a variety of the products in terms of color, material, the style was considered as making selection of the test products. The brand recognition of the selected eighteen products, nine for each category, was tested through an online questionnaire to be sure that there will be no influence by the brand on the consumers in the test.

In the pre-test, first, participants answered whether they could recognize brands of any the products shown in the image via the online survey platform, Google forms (figure 16). Later, the ones who recognize the brand were asked to name brand (figure 17). All visual signs, such as logos, of the brands, were removed from the product images in the questionnaire via Adobe Photoshop so that the participants can answer the questions by only stimulated by brand image (figure 15). Moreover, it was minded that each product has the same number, size, and the type of images in order not to mislead respondents.



Figure 15 Brand logos are removed from original product images via Adobe Photoshop.

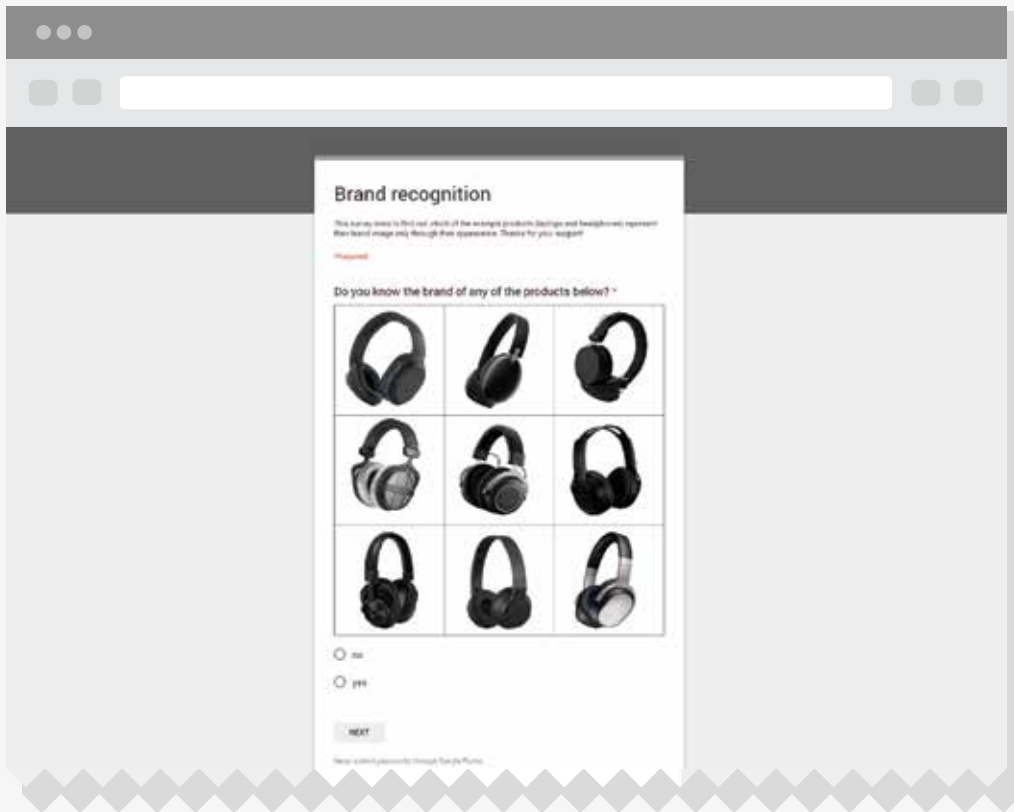


Figure 16 Participants who can not recognized any of the brands are guided to next question asking brand recognition of selected laptop stands.

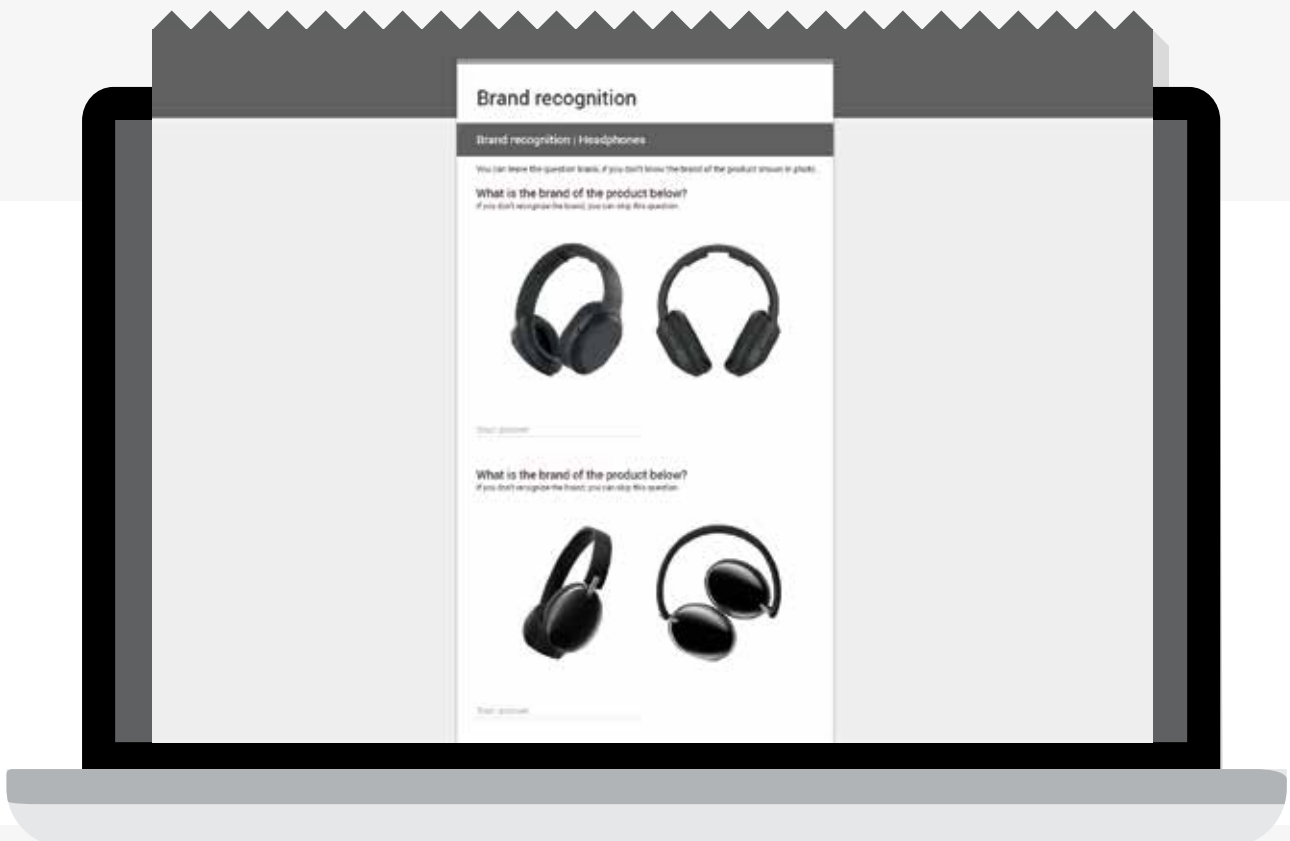


Figure 17 Participants are able to skip questions of the product whose brand is not familiar to them.

The online questionnaire was shared on several Facebook groups which have mainly student or expat members living in the Netherlands. In total, 109 participants responded to the questionnaire. Results of the questionnaire showed that participants could not identify the brand of almost any of the laptop stands presented (figure

18). Similar to the laptop stands, a brand of the headphones could not be recognized to a large extent (figure 19). Almost all of the headphone brand was unknown for at least %75 of the responders, except Fresh'n Rebel branded item whose brand seemed familiar to %39 of the participants although only %3 made a correct

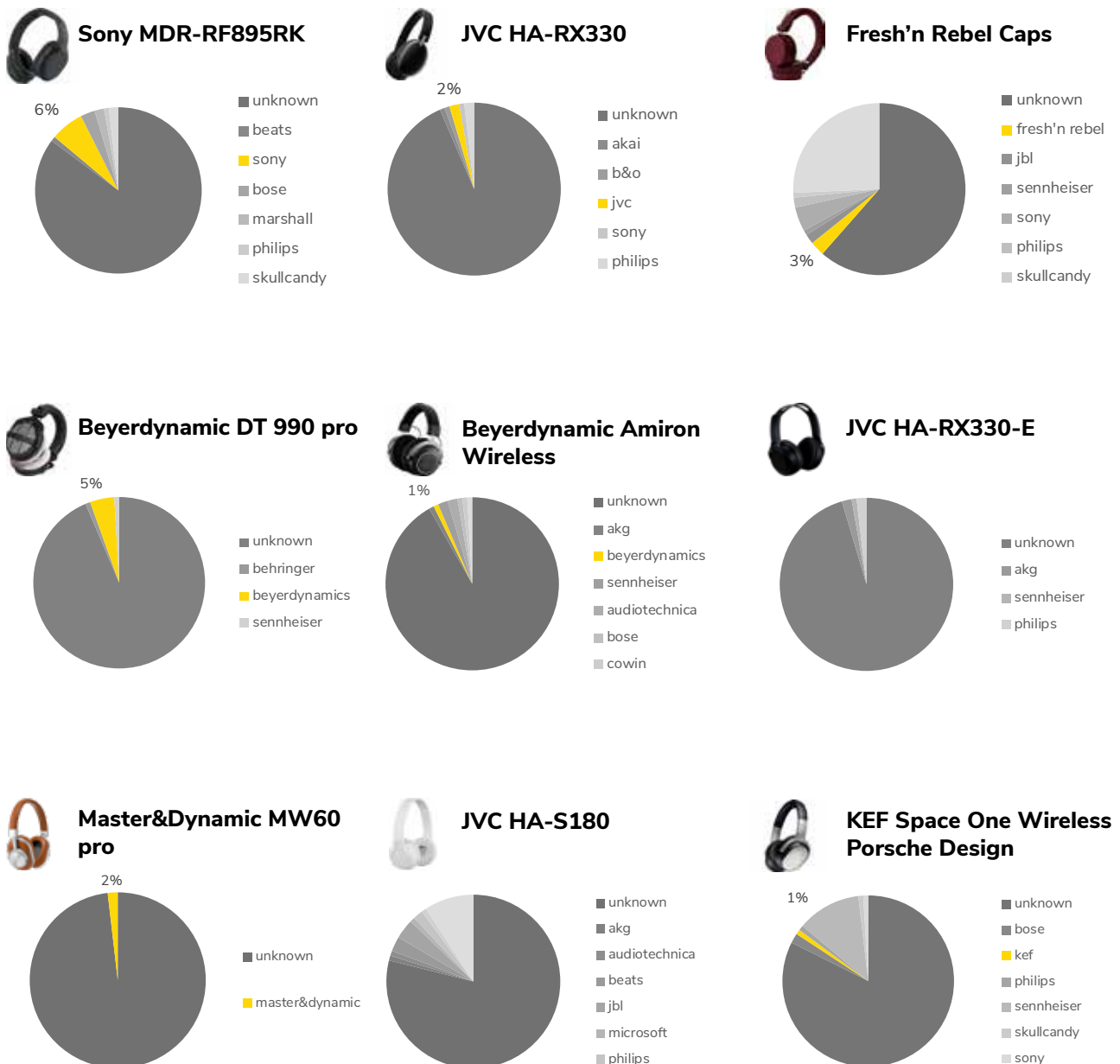


Figure 18 Brands of any laptop stand alternatives did not seem familiar to the participants.

assumption. This item was still included in the test, since only a few respondents made a correct assumption on the brand. Although some participant made assumptions on brands, the majority of the brands could not be recognized by a clear majority. Even the most known product brand was identified as correct by only %6 of

the participants (figure 19). Results of the online survey showed that the selection of headphones and laptop stands were suitable to be used in the test since their brand image was not as strong as if it could bias consumers in the test.

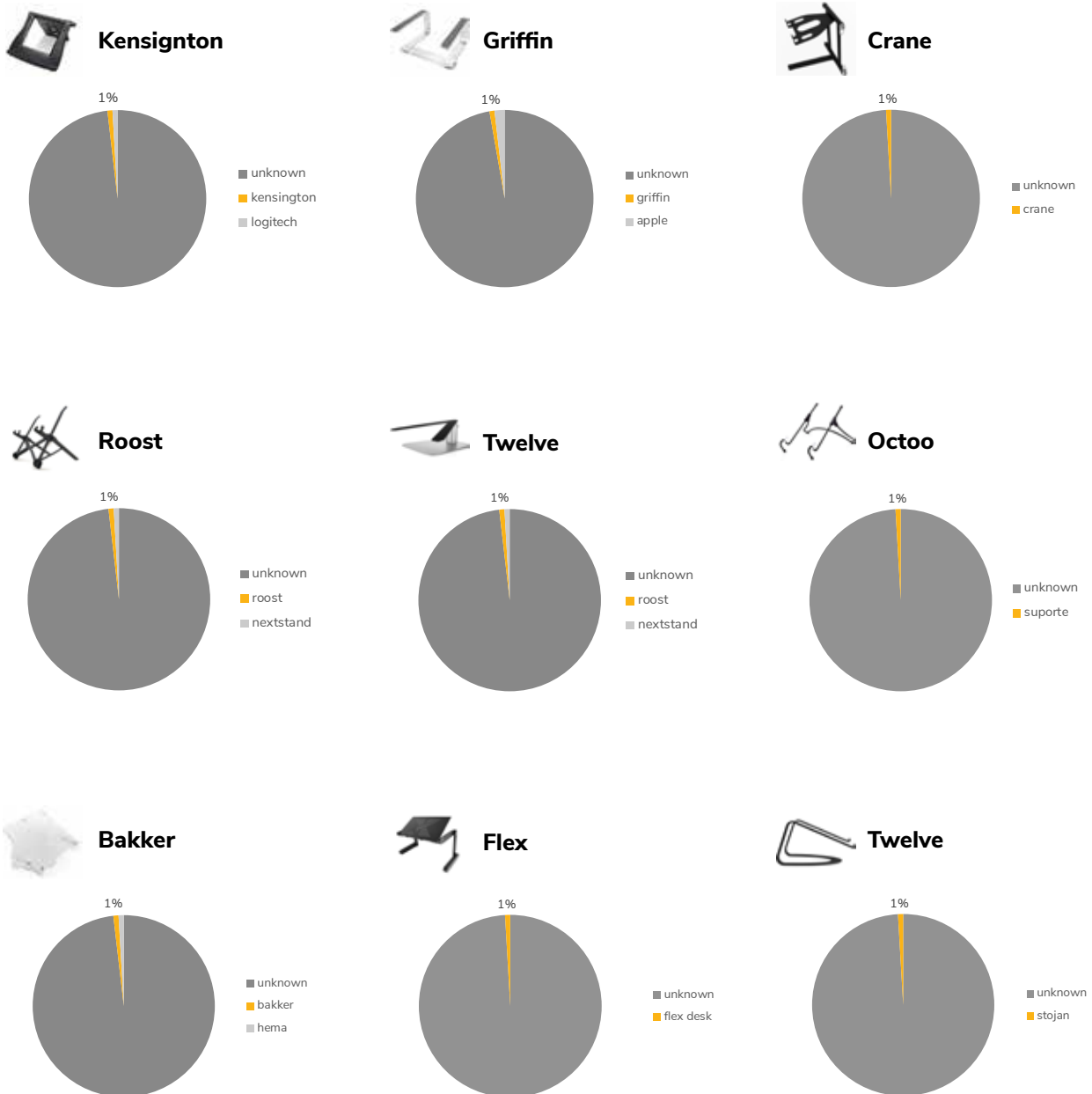


Figure 19 The participants knew brand of Sony branded headphone the most.

5.1.1.2. E-commerce platform

An online shopping platform was developed to create a realistic test setting. In order to achieve realism in platform development, an e-commerce website benchmark was done to find out what a standard e-commerce site includes in terms of user interface elements. Fourteen e-commerce platforms, mainly selling electronics or office supplies and accessible in the Netherlands, were chosen to be assessed. All UI elements in the home page, search result page, and product page of the selected platforms were identified (figure 20). Since the test only included one basic task which is choosing a product through the website, some other pages like accounts & support page or checkout page were not studied in the scope of the benchmark. However, still, these pages took their places in the platform designed for the experiment to increase the realism of the setup. Based on the results of the benchmark, many of the most frequently seen UI elements were decided to include in the test website. On the other hand, some of them, such as reviews and recommendation agent, had to be out of the test site in order not to increase research variables and technical limitations.

Moreover, number and type, like cut-out, in-scale, in-context, side view, etc., of the product images presented in the selected e-commerce platforms were assessed in the scope of the benchmark (figure 21). Visual presentation of both product categories, laptop stands, and headphones, were identified to present them realistically in the experiment. However, in-context images of headphones were not included to the test

platform, because these images were expressing lifestyle of potential user of the products rather than telling use context of the products. Thus, any in-context images was not used in the platform in order not to lead a certain group of participants to a certain product by over stimulating with in-context images.

Additionally, the price range of both product categories was researched. Although it was aimed to present the products with their original price tags in the test platform, it was sometimes not possible. Since there was a significant price difference between a couple of products, some price tags were changed to narrow down the price range. Another reason for limiting the price range was to prevent participants from basing their purchase decision on the product price. In the test platform, the price of headphone alternatives in the test was between € 109.99 and € 149.99, whereas the price difference between the most expensive laptop stand and the cheapest one was only € 15.04.

In the guidance of the benchmark study, an e-commerce platform including two different product categories, headphones and laptop stand, was created via an online tool called wix.com (figure 22, on the next pages). Usability and realism of the website were enhanced during the stimuli design process through the feedback given by the supervisory team and the pilot test. Final version of the website can be found in Appendix C: The website.

	amazon	target	best buy	apple	bnh photo	dell	tiger direct	microsoft	sears	kohl's	walmart	bol	cooblu	mediamarkt	
1# top product categories	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
2# search bar	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
3# cart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4# account	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
5# add (sale)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
6# product categories	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
7# support	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
HOME PAGE															
1# full product name	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
2# brand	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
3# price	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4# rating	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
5# shipping	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
6# product features	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
7# color options	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
8# add to compare	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
9# add to cart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
10# add to wish list	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
SEARCH RESULT PAGE															
1# full product name	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
2# various product images	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
3# price	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4# rating	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
5# reviews	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
6# shipping	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
7# product features	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
8# color options	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
9# size	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
10# add to compare	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
11# add to cart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
12# add to wish list	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
13# RA	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
14# see the whole category	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
PRODUCT PAGE															

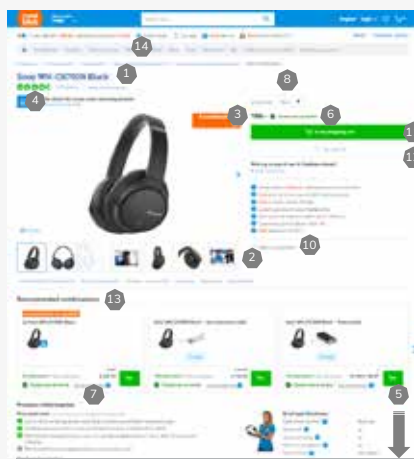
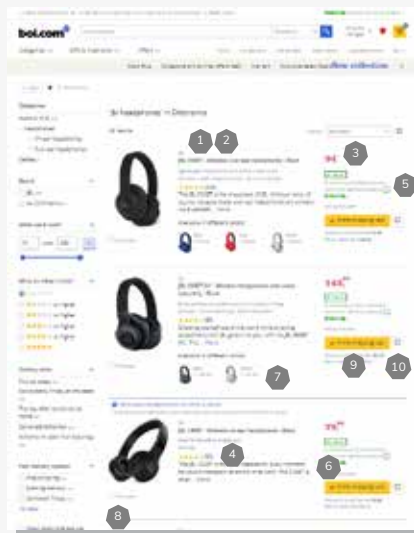


Figure 20 Examples of all UI elements are shown with reference numbers on the right.

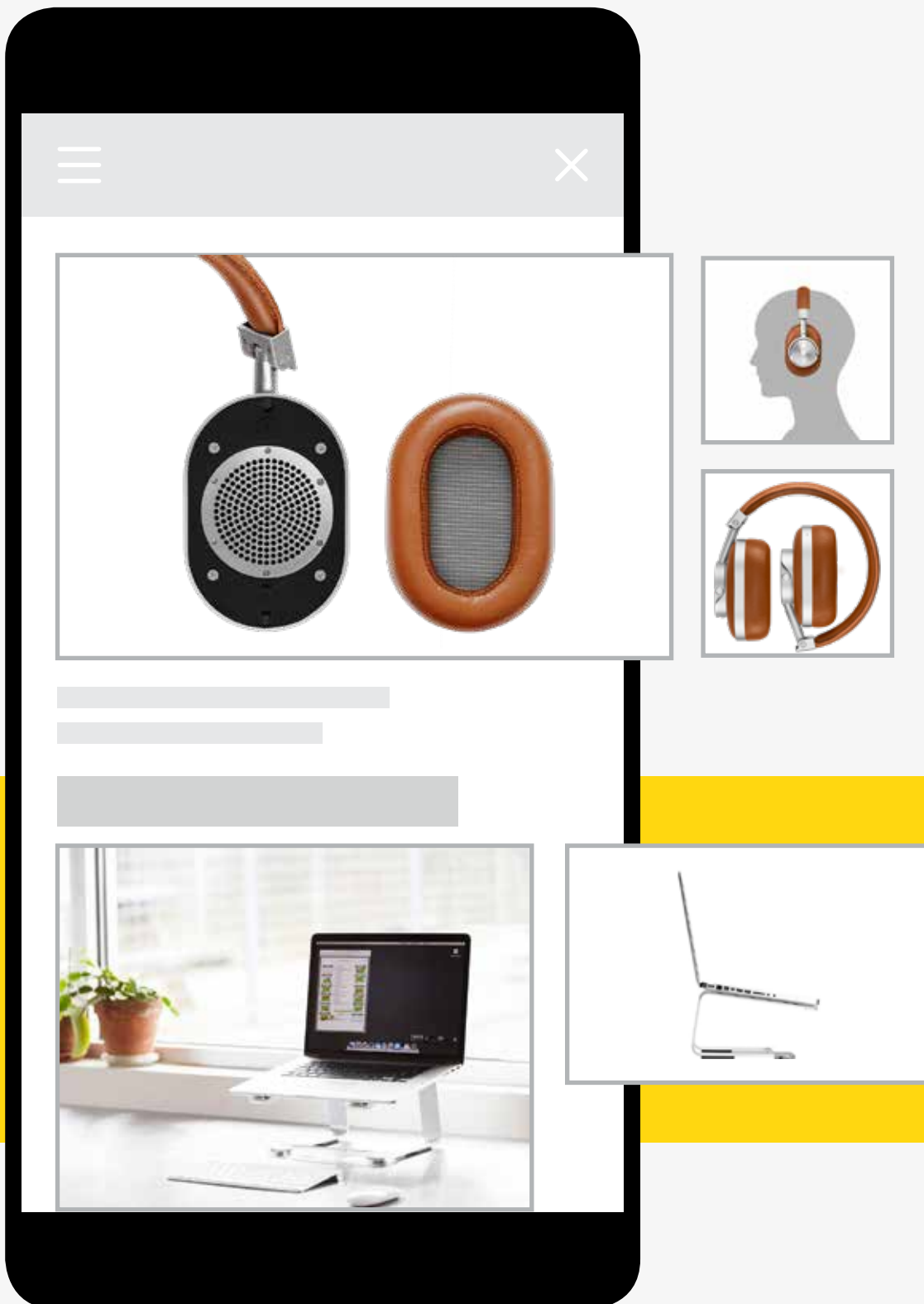


Figure 21 Products are usually presented with in-scale, in-context and cut-out images.

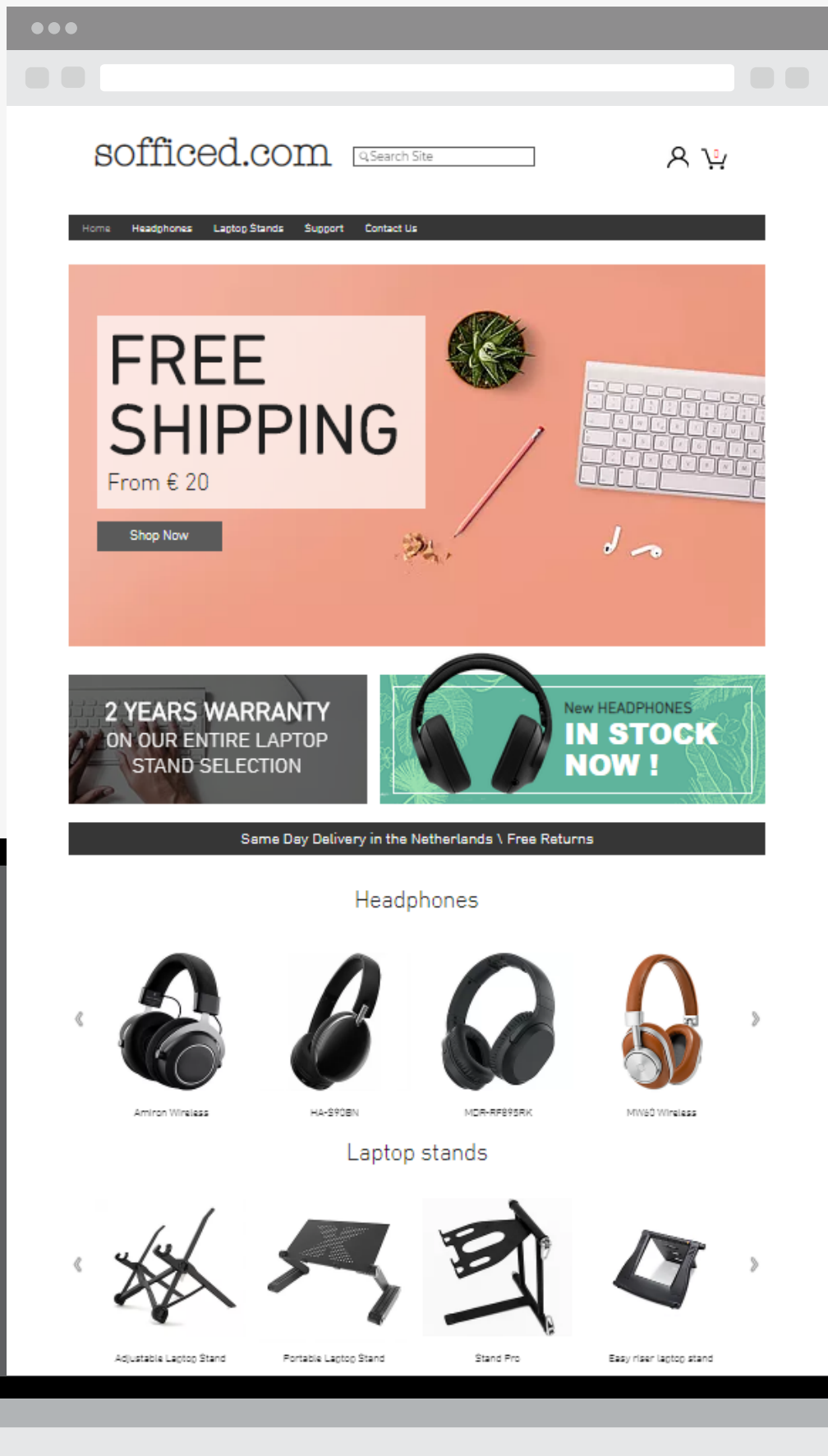


Figure 22 For the experiment, an e-commerce website called sofficed.com is designed.

5.1.2. Semi-structured interview guide

A semi-structured interview guide, including open-ended questions and probes, was designed. The questions were ordered from easy to difficult in order not to bother the participant (Appendix B: Test Instruments). Also, a couple of questions directly pointing out 3rd and 4th research questions, like “How did the product images influence your decision?” and some asking realism of the test setting, like “Is this a realistic setting for you when you consider the website

and the products?” were marked as must to be asked. However, still, the interview guide was not structured so much to give some freedom to both interviewer and interviewee. Moreover, questions in the guide were written by using simple grammar to prevent any miscommunication caused by the language barrier, since the interviews were done not in a native language but a neutral language, English.

5.1.3. Post-interview questionnaire

In order to access some demographic data of the participants and learn their involvement in the test object, a post-interview questionnaire was developed (Appendix B: Test Instruments). The questionnaire consisting of two main parts, one part asking demographic information and the other part evaluating participant’s product purchase decisions, was planned to be given at the end of the test in order to allow the participant to make a comparison between purchasing decision of different products. In the second part of the questionnaire, it was asked to participants to evaluate their purchase decisions in the test with involvement items, such

as very important/very unimportant decision, the decision requires a lot of thought/decision requires a little thought, and relevant decision/irrelevant decision (Ratchford, 1987). The aim of making the participant evaluate his/her purchase decision was to see the trustworthiness of the research setup. Input of the participants who shows very low interest in purchasing a laptop stand or a pair of headphones decided to be excluded from the analysis. This was because this group of participants do not represent the general consumer group of the headphones and the laptop stands.

5.2. Procedure

The experiment took approximately 25 minutes for each participant. First, the purpose and scope of the study was briefly explained to the participant, and their consent for their participation was asked. The participants agreed that their voice and somebody gestures could be recorded in a way that their face cannot be recognized by signing the informed consent form (Appendix D: Consent form). After obtaining the consent, essential functions of the website and the device, touch screen, was explained briefly to the participant. The participant was also asked to think out loud as performing the tasks, purchasing a laptop stand or a pair of headphones. While performing the tasks, the participant was asked to verbalize her/his actions or statements. The researcher involved in the test too little not to manipulate the research as the participants were performing the tasks. Order of the product was swapped for every participant to prevent any bias results caused by the task order (figure 23). For each task, the researcher took notes on the

products images checked by the participants or the purchased products. After performing both tasks, the participant was asked to answer the post-interview questionnaire. As the final step, the participant's comments or suggestions about the study were asked, and the gift voucher was presented to the participant as a token of the researcher's appreciation.

Immediately after each half of the data collection process, the interviews made in the test were transcribed via otter.ai online transcribing tool. Transcribing was also done by the interviewer as it was suggested by Mariette Bengtsson (2016). Therefore, a few experiment contexts, such as products mentioned or body gestures, could be added to the transcribes in brackets (Appendix E: Transcripts). All the transcribes was shared with the supervisory team to get feedback and make immediate changes if something is going wrong in the data collection.

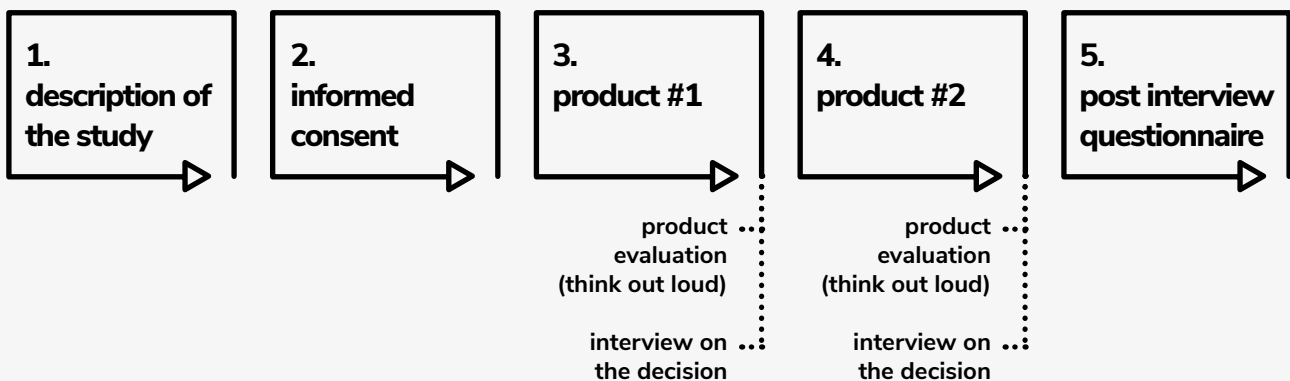


Figure 23 Experiment flow was the same for every participant.

5.3. Setting



Figure 24 The non-verbal interaction between the interviewer and interviewee is kept open and friendly.

The experiment took place in two different locations in Industrial Design Engineering Faculty at TU Delft. The first half of the total number of experiments were conducted in Comfort lab with mainly students, while the other half was done in PEL (product evaluation lab) in the faculty with the panel members. The test devices, such as touch screen, video and voice recorder, and the test instruments were the same for both test locations. The camera was placed in front of the touch screen so that it can record the experiment without recording the participants' faces. The

touch screen was chosen as the test device for the experiment since the literature review suggested that the direct touch interfaces could allow consumers to think more about material qualities of products as shopping online (Brasel & Gips, 2015). During the task performance, the interviewer sat next to the participant not to create a border between her/his and the screen, and not to disturb his/her concentration (figure 24). Also, the test environment was kept clean and simple in order not to distract the participants during the test.

5.4. Sample

Purposeful sampling was chosen as a sampling strategy for experimental qualitative research. Half of the participants, 22 in total, were recruited through personal connections in the industrial design faculty whereas the other half, 21 in total, was contacted through PEL (product evaluation laboratory) in Tu Delft. As recruiting participants, it was minded creating diversity in the sample in terms of occupation, gender and age to increase the representativeness of the study. Individuals in the 18-40 age range aimed to be recruited, since it was assumed that elderly people may have difficulties in expressing themselves in English unless it is their mother tongue. Also, “having a laptop” and “having experience (not have to own one) with headphones” were set as a recruitment criteria for the research. The idea behind this criterion was not to recruit consumers who would consider purchasing a laptop stand or a pair of headphones as an irrelevant decision. The participant being contacted by PEL were rewarded for their contribution to study with 15 euros cost voucher.

Ultimately, different genders and employment status were almost equally distributed within the sample, 43 participants. %58 of the participants defined themselves as female, whereas %42 of them identified their gender as male (figure 25). Similar to the balance between different genders, almost half of the sample (%44) were full time employed, and the rest (%56) were students at TU Delft (figure 26). Regarding the age, the participants were in the age range between 22-41, and the average age was 28,16 (Appendix F: Demographic data set). Having such a young sample group was caused by the fact that mainly young people felt confident about participating in an English experiment and the large proportion of the student participants. Also, the majority of the sample was made out of the one who received at least Bachelor’s degree (%60) (figure 27) or did a design related study before (%70) (figure 28). This was because next to the participants recruited through personal contacts, participants recruited by PEL were also mainly TU Delft IDE alumni.

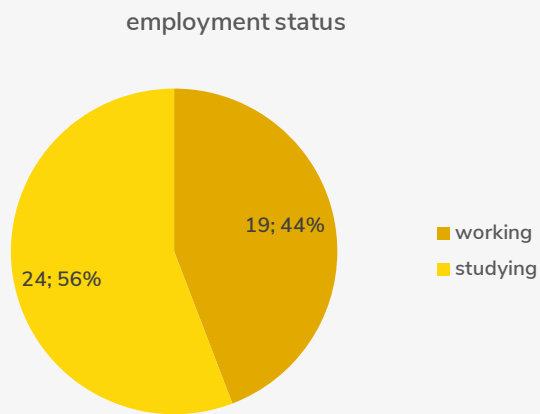


Figure 25 Almost equal number of students and full time employed ones participated in the test.

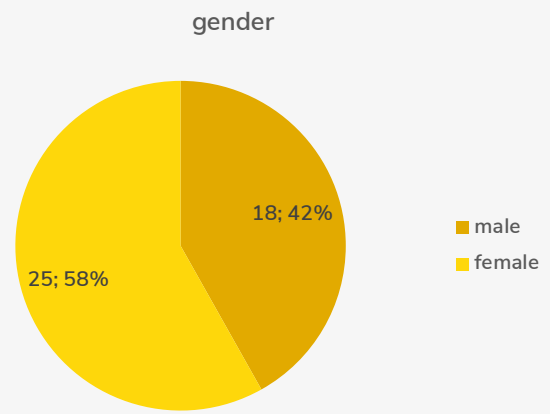


Figure 26 In total, 43 participants (18 male, 25 female) contributed to the study.

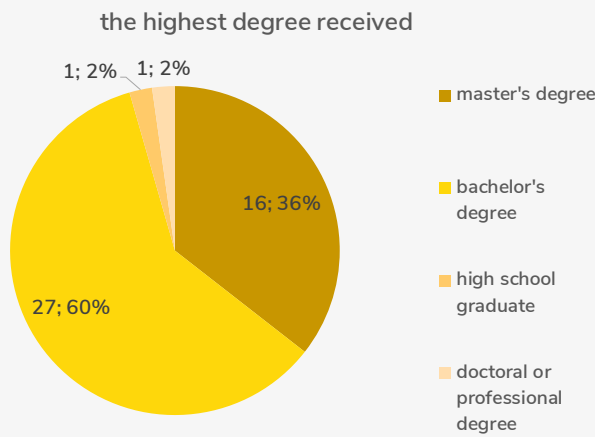


Figure 27 All the participants completed at least high school education.

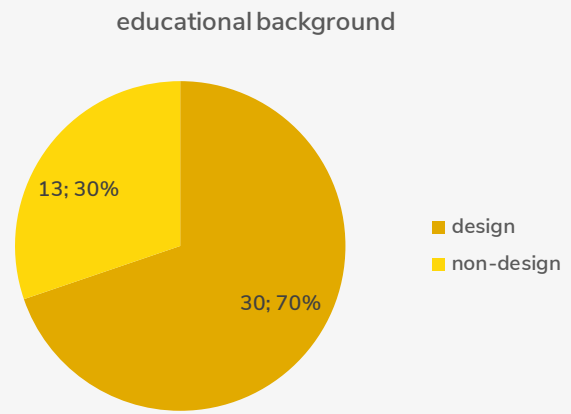


Figure 28 One third of the participants never had a design related education.

5.5. Data analysis

The raw data, 43 experiment transcripts, was analyzed by taking the inductive reasoning approach. Throughout the data analysis process, it was aimed to draw conclusions from the collected data and be open to new concepts (figure 29). The analysis process started with over-viewing 1/6 of the transcripts to get familiar

with the data. Then, the participant quotes which can potentially answer the research questions or test the hypothesis were labeled with a code via Atlas.ti. As for labeling, the statements, constant grammar, and vocabulary were used for the codes to cluster them easily in the next steps.

Some sensitizing concepts, like concepts from literature review or research questions, were used as guidance as coding. For example, the participant quotes answering an interview question about the realism of the test set were labeled as “realism:...”. On the other hand, the quotes said in a particular stage of purchase decision-making the process, such as product evaluation or final decision making, were coded as “criteria:...” or “reason of purchasing:...”. Also, memos were written during the process to recall the concepts mentioned in the experiment in the future easily. After coding the 1/6 of the data, the transcripts were overviewed one more time to see if there were missed points.

The codes were then clustered by being compared across phases of the experiment and tasks (purchasing a pair of headphones or a laptop stand). Some of the codes were divided in two since they had different meanings for

different experiment tasks. Once all the codes were in suitable categories, a codebook was created and shared with the supervisory team to be discussed one more time (Appendix G: Codebook). Once everything was checked, the rest of the data were coded, and some new codes were also added to the codebook.

After coding the whole data, the existing codes were clustered again. Since a content analysis planned to be done for the study, it was not minded a lot to discover relationships between the code groups. Only some “... is a” and “... is the cause of” relationships between the code groups were detected (figure 31). Finally, all the codes created in Atlas.ti was exported to Excel and SPSS for the content analysis, which allows qualitative data to be converted into quantitative data (Bengtsson, 2016). Through the content analysis, frequencies of all themes and concepts were determined in the gathered data per participant.

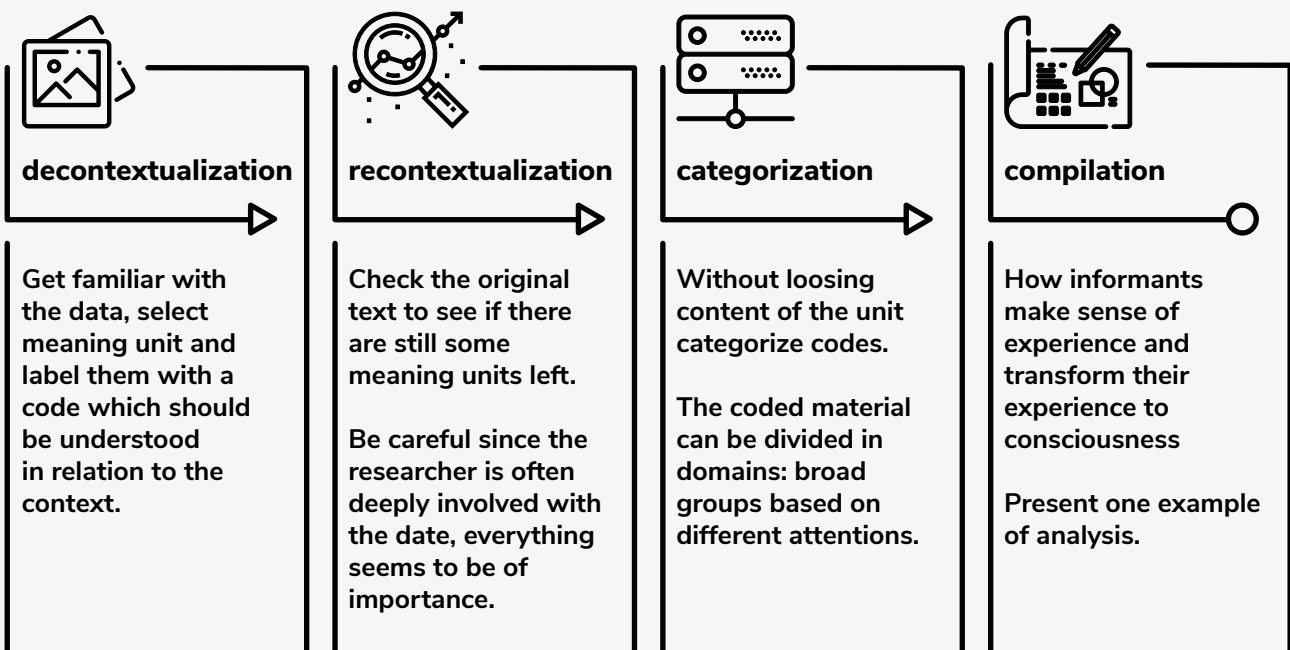


Figure 29 Stages of analysis can be repeated several times during the analysis process (Bengtsson, 2016).

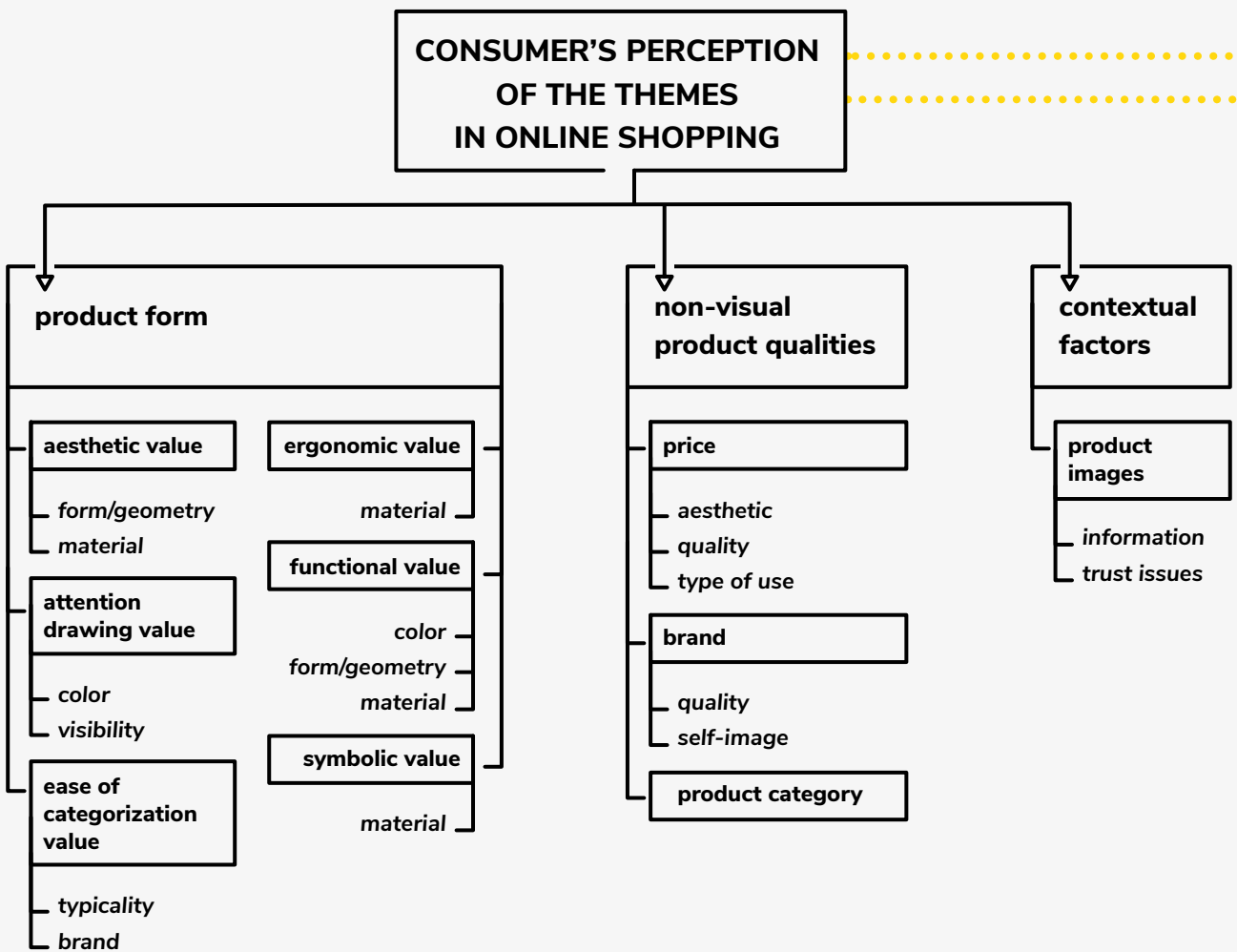
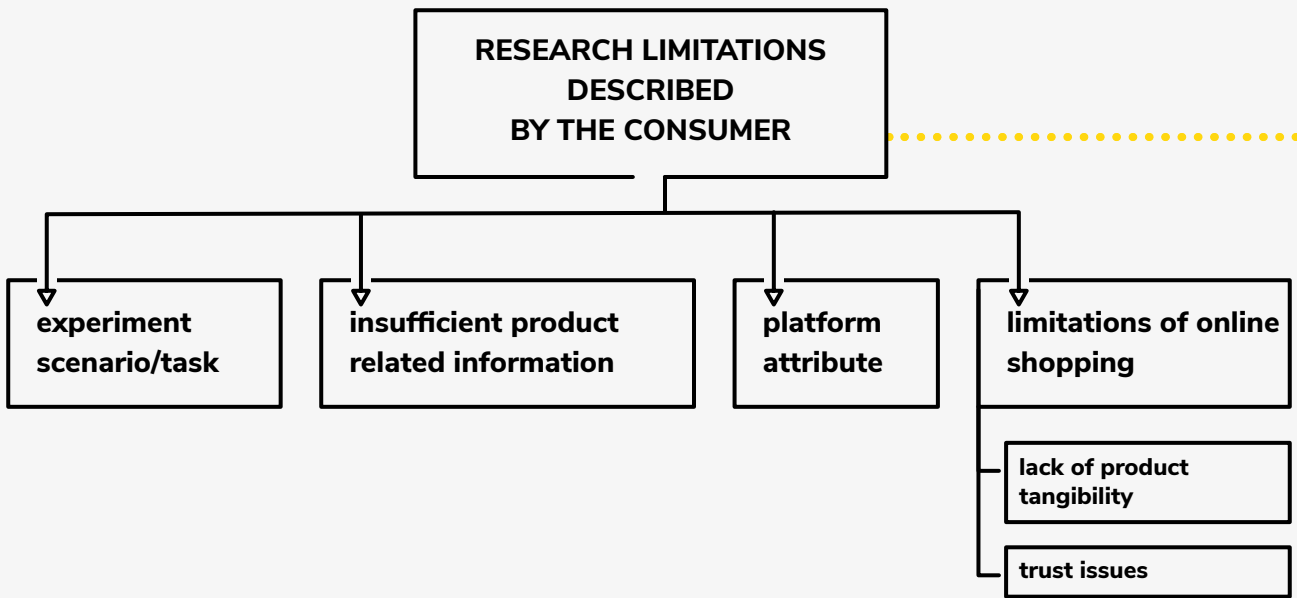
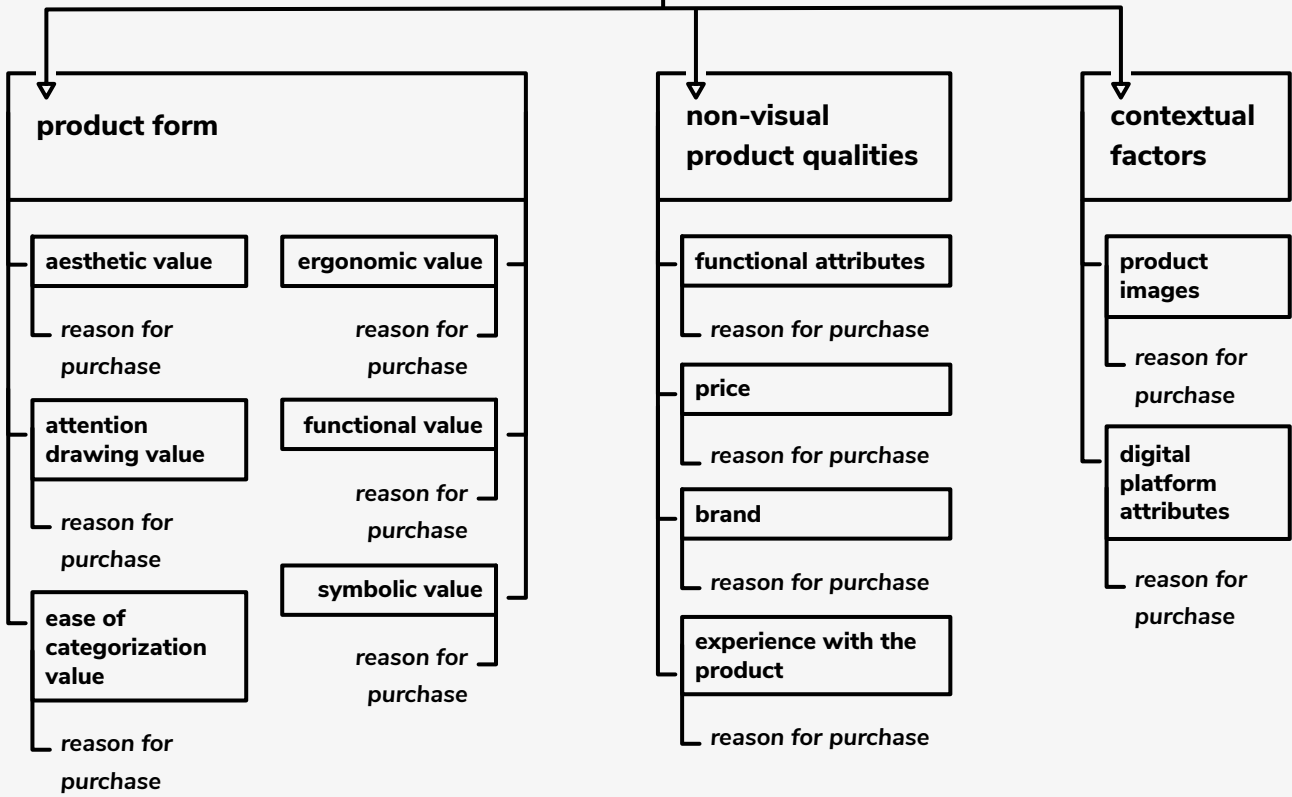


Figure 30 The code map showcases the relationships between the codes, the sub-groups, and the groups.

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CONSUMER'S PSYCHOLOGICAL & BEHAVIORAL RESPONSES TO THE THEMES IN ONLINE SHOPPING



5.5.1. The trustworthiness of the analysis

In order to increase the credibility of the analysis, the supervisory team involved in the whole data analysis process with their critical point of view, and it was ensured that no relevant data was missed. Also, a part of the data was examined with the whole team, and the codes were compared with each other to prevent research biases. In this way, the confirmability of the analysis could be constituted somehow. On the other hand, the transferability of the analysis stayed limited

due to the nature of qualitative research. Since qualitative research is context depended, it is hard to extend the research outcomes of a context to the other contexts. However, still, the data and the context in which the research took place were described in detail to increase the analysis' transferability. Furthermore, memos were written during the whole process so that the research team can easily track the changes and improve the dependability of the analysis.

6. Results

In total, forty-three respondents participated in the study. The experiment took approximately twenty-five minutes per participant. None of the participants had difficulty in understanding the tasks or basic functions of the test products, laptop stands, and headphones. Also, there were not any participants having problems

interacting with the touch screen used as the test device in the research. The overall outcome of the research shows that consumers show both behavioral and psychological responses to the product form in digital environments. However, the extent of these responses shows a difference in different product categories.



6.1. Behavioral and psychological responses to product form in digital environments

6.1.1. The role of the product appearance

The six roles of the product appearance, communication of aesthetic, symbolic, functional, and ergonomic product information; attention drawing; and categorization, exist in the consumer's product evaluation process as either a product evaluation criteria or reason for purchase. The research findings show that all participants gave psychological or behavioral responses to at least one role of the product appearance as performing the tasks during the experiment (figure 31). Almost half of the participants took

four values of the product form into account as evaluating the headphones presented in the test website, whereas the same amount of people considered three of them as choosing a laptop stand. For both product categories, only one participant considered all six of product form values, aesthetic, attention drawing, ease of categorization, ergonomic, functional and symbolic value, as making a purchasing decision. Similarly, less than %1 of the sample thought about less than three product appearance roles.

number of product appearance roles considered by the participants during evaluating the products

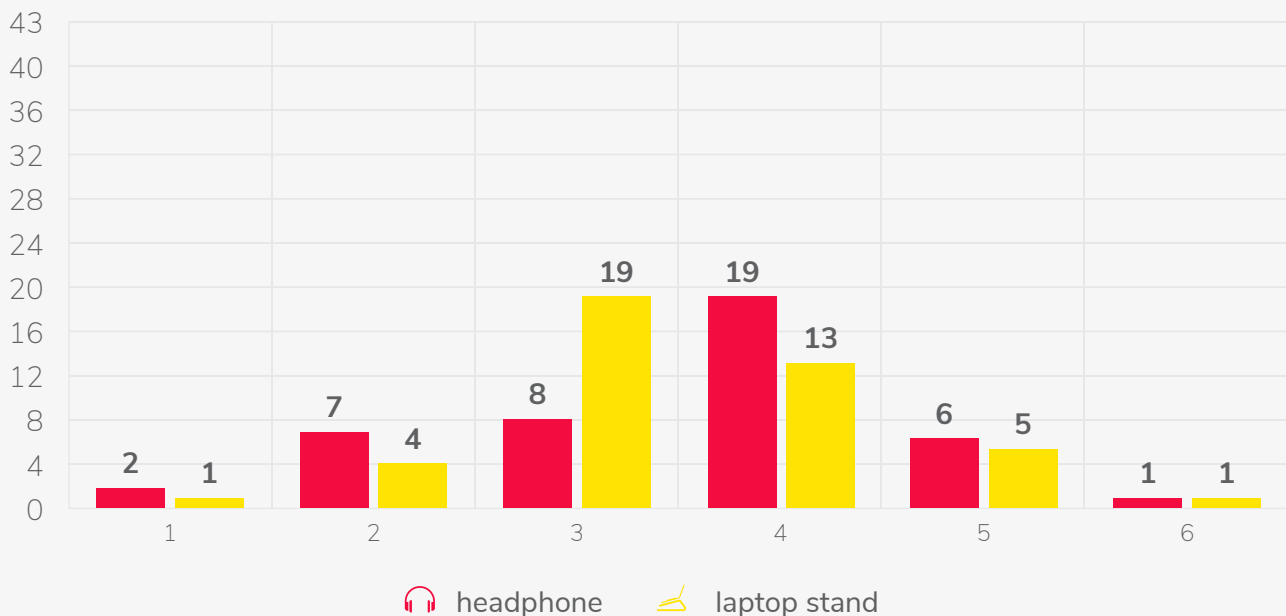


Figure 31 All of the participants considered at least one product appearance value as evaluating the products during the experiment.

Among the mentioned product form values, the **aesthetic value** was the most considered one for both product categories in the experiment. More than %80 of the participants responded to the aesthetic value of the appearance of the products chosen for the experiment, and more than half of them pointed out it as a reason for purchase (figure 32). Most of the participants aimed to purchase an aesthetically appealing option in both product categories. By more than half of them (23), simplicity, described as unity or continuity of product shape or color by the participants, was discerned as a sign of aesthetic value for both product categories. Similarly, product material was related to the aesthetic value of the form in some cases. One of the participants explained how she perceived aesthetic value through the material of the headphone by stating, "Um, I think that it is leather and that it stays classic in a way.". On the other hand, the color was often minded by the participants as evaluating the aesthetic value

of headphones, while it was not a big consumer concern in laptop stand product category. The participants (8) also indicated that a headphone should not be too big or bulky to be an aesthetically appealing one. One of the subjects said, "Yeah, the thing with these headphones, they can be very big and bulky. I don't really like that look.". Regarding the response to aesthetic value in laptop stands, some subjects (14) mentioned that ideally, a laptop stand should aesthetically fit both its usage environment and the laptop. One of them said, "I do not like this black one. And since my laptop is metallic I want this you know metallic too.".



consumer responses to the product form

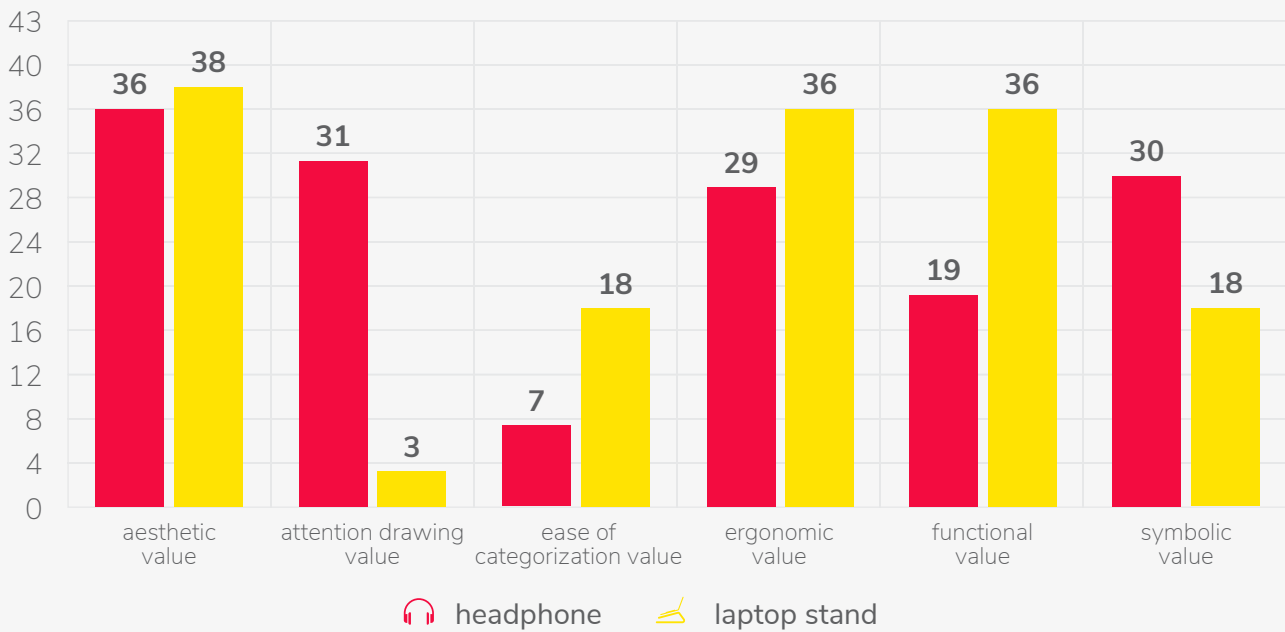


Figure 32 In the experiment, participants responded to aesthetic value the most in both product categories.

After the aesthetic value, **attention drawing value** (%72, 31 in total) was the second most frequently considered value by the participants as purchasing a headphone, whereas it was only mentioned three times by the participants as choosing a laptop stand (figure 32). The participants mentioned that they saw attention drawing value through the product color or socially significance of the product as choosing a headphone whereas they have never explained how they perceived attention drawing value in laptop stands. As deciding on different headphone alternatives, some of the subjects (13) preferred a neutral color described as black and gray for headphones. One subject stated, “So I prefer something more neutral. Okay. It’s kind of... I don’t know... For instance, black is a color that you can associate that with everything. “. Similar to the neural color preference of the consumers, a non-catchy look was also desired by some subjects who want to play safe (9).

As opposed to these nine participants, almost the same number of participants wanted to purchase a different looking headphone to “make a statement.”. One participant mentioned, “I think I would buy this one because for me this one stands out from the others.”. For sixteen of the participants, their consideration regarding the attention drawing value of product form became a reason for their purchase of headphones. On the other hand, none of the participants made their purchase decision based on the attention drawing value in laptop stand product category. Likewise, only three of the participants responded to attention drawing the value of a laptop stand by concerning originality of the laptop stands presented in the test website. For example, one subject stated, “I won’t choose it, because it is a very common laptop stand.”.

Ease of categorization role of the product appearance was the least considered one by the participants (7) in the category of headphones (figure 32). In the experiment, one subject positively approached a headphone alternative since she found it more recognizable than the others because of its brand images. She described her thought as “I don’t know, the brand. I cannot tell you which one because I don’t know. But they look similar to some of them.”. Similarly, the typicality of the products was often appreciated by the participants, although they didn’t often mention it as a reason for their purchase or a criterion for their product evaluation. One of the participants elaborated on her perception by stating, “And then it looks like the one that I did see a lot around. So probably it is very good.”. On the other hand, one participant saw strong brand image as a risk factor while purchasing

a headphone and stated, “I know it is from JBL. Looks like JBL without a brand like a fake.”. The rest of the seven subjects (6) indicated that they don’t prefer the headphones visually representing other category products. One of them explained her preference regarding ease of categorization value as follows: “I just don’t like, it looks like it’s an air conditioner.”. Ease of categorization value played a similar role in the participants’ product choice in the category of laptop stands. Almost %40 of the subjects (16) preferred to purchase an item which can be easily identified as a laptop stand. One subject said, “This seems nice but it is a bit like forklifts, so I wouldn’t go for that one.”. Although ease of categorization value indeed existed in the participants’ purchase decision-making process, none of the participants showed it as a reason for their final purchase decision in both of the product categories (figure 33).

consumer responses to the product form

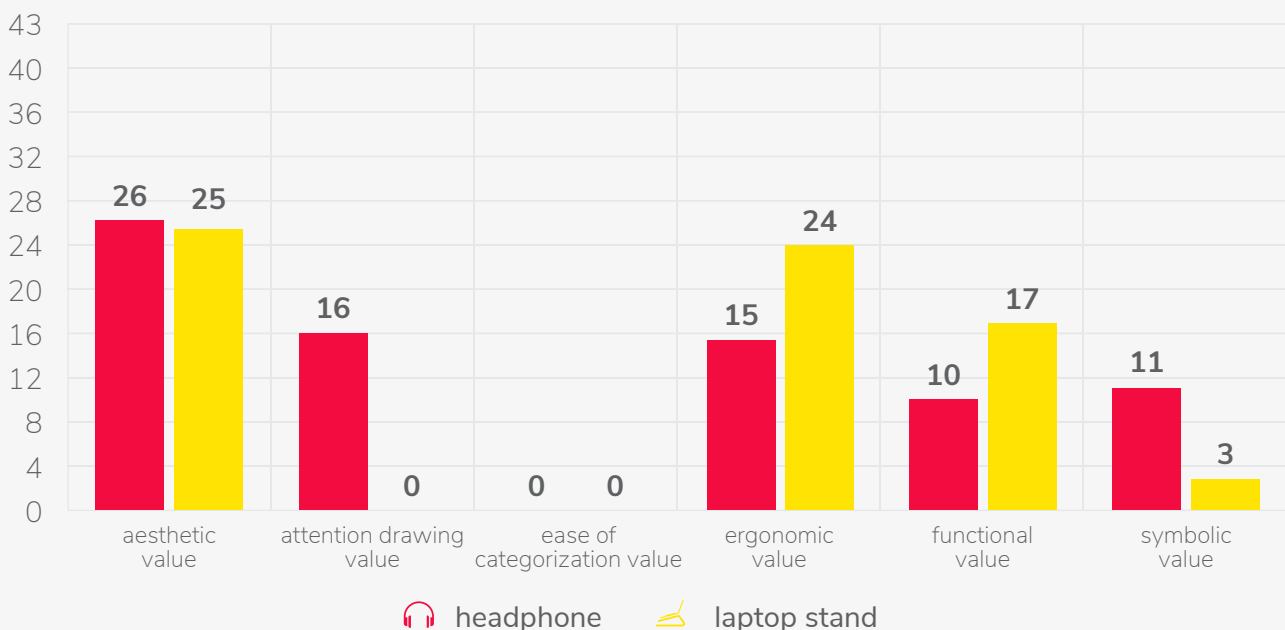


Figure 33 None of the respondents considered ease of categorization value, making their final purchase decision.

More than 80% of the participants (36) mentioned considerations regarding **ergonomic role** of product form as a basis of their product evaluation process of laptop stands. Of these, 19 subjects prefer laptop stand, which seems like occupying less space and easy to store, whereas the same number of subjects prefer laptop stands which can communicate about the product functions. For example, one subject explained why she disliked a laptop stand as follows: "This seems too complex. When I'm looking at it, I'm not sure where to put my laptop at once.". In addition to consumer considerations in ease of use and storage, some respondents (13) considered the height and angle adjustability of the laptop stands. The ones who preferred an adjustable one also checked the images in the test website in detail to see the product mechanism. More than 1/4 of the subjects preferred a foldable one for easy transportation. One of them elaborated on his consideration by stating, "And it is very compact. So and yeah, I'm traveling a lot so that's the reason for me would be to look for one that's can collapse really easily.". The ergonomic role of the product appearance also played a final decision maker role for 24 of the 36 participants considered the ergonomic value of product form as choosing a laptop stand (figure 33). Similar to the category of laptop stands, the majority of the

subjects (29) had considerations in ergonomic value of the product form in the category of headphones (figure 32). Almost half of these 29 paid attention to material quality and form of headphones to evaluate the comfort of the ear cups and the headband. One participant explained why she found a headphone comfortable as follows: "The headband is not like an entire piece of plastic, but it has this hole in the middle. It gave me the idea that all my hair, for instance, can well adapt. So, I see here that, for instance, this part [the sides] is really hard and resistant, while this part [headband] and this part [ear cups] are more like soft because they are the parts more in contact with my head.". Regarding the physical fit of the product form, two participants mentioned that they prefer an adjustable one to regulate the height of ear cups. A few subjects (3) indicated that they would like a simple and visible display on the headphones to efficiently operate it. As one said, "You can control the music through the buttons. Okay, so I think this as a fancy option to use.". One-third of the ones who responded to the ergonomic value of headphones preferred foldable and easily transportable headphones. Although 29 subjects considered an ergonomic role when evaluating headphone options, only almost half them (15) made their final purchase decision based on it (figure 33).



Comparable to ergonomic value, the **functional value** mentioned by more than %80 of the sample (36) as purchasing a laptop stand (figure 32). A vast majority of them (29) assessed the robustness of the product through its form. One participant explained how she eliminated laptop stand alternatives as follows: "If I have to compare 9, these nine laptop stands, this one looks better, because it looks more stable.". Additionally, some participants (6) associated the size of the product with the performance and perceived risk in use of the product with visible and complex mechanism, like screws and hinges, in both product cases. One of the participants explained this perception with the quote, "So if this one gets folded, then maybe the sound will be distorted. So maybe I will not use this one.". On the other hand, nine respondents concerned about physical fit of their laptop with

the laptop stand that they will purchase. They evaluated the functionality of the form of different product alternatives based on dimensions and weight of their laptops. Accordingly, they often mentioned that they need to be sure their laptop will be safe before deciding on a laptop stand. One of the participants explained his functional value related consideration as follows: "I think I have a heavier laptop, and I want to be safe, like it should be sturdy and secure.". On the other hand, some participants (8) derived an impression about durability of the product from its material. However, none of them based their final decision on material quality. Many of the final purchase decision in the scope of functional role was made based on perceived robustness of product form by the participants (15, almost %35 of the total sample).



Compare to laptop stands, the functional value of the appearance of headphones was not mentioned a lot by the participants (19). Six of the participants had considerations about functional adaptability of headphones, like some sockets visible on the form, with the devices that they already have. One subject, who said "It looks high tech, so it is probably good.", expected high performance from a headphone alternative just because of the high tech appearance of the product. Again, only one participant did not prefer compact headphones due to the idea of compact ones do not produce good sound. Majority of the participants (10 in total) responded to the functional value considered the robustness of product form and the product material, similar to the case of laptop stands. One of them said that "And when I look into more detail, it is produced in low quality here. Moreover, I feel like this is the second-hand plastic, so reused. It has a bad smell. I do not like this material.". Some others also relate color to the functional value by considering that white product gets quickly dirty and wear off. For 10 participants, around 1/3 of the ones took functional value into account, based their final decision on the functional value of product appearance (figure 33).

The symbolic role of the product appearance took place in the product evaluation process of almost %70 of the participants (30) while performing the task of choosing a headphone (figure 32). Nineteen respondents looked for a headphone alternative which can fit their style, like the sense of fashion, as if it is a part of their outfit. Also, according to 15 of the participants' perception, headphones are like a fashion accessory. One of the subjects noted, "They just don't fit with my style. I don't

think I would like it, if I was wearing them." in furtherance of the analogy between headphones and accessories. Some of them (5) mentioned that they perceive a certain style through the product material. One of the participants said, "I mean, like this color of this black plastic, which is not black is really, it reminds me of the 90s or early 2000s." Moreover, some participants (14) mentioned that their choice of headphones should represent their personality and lifestyles. For example, one participant explained why she did not purchase one of the headphones in the test as follows: "Maybe if I am a stylish person, I would buy this but I'm not stylish.". Additionally, a minority of subjects (6) indicated that they did not prefer a headphone which looks cheaper than it is. As making a final decision on headphones, only %30 of these considerations became a reason for purchase. On the other hand, even a smaller number of participants (3) showed the symbolic role of product appearance as a basis of their final purchasing decision for the product category, laptop stands (figure 33). Although 12 participants mentioned that they prefer a laptop stand which can visually represent them, only one of them decide on a stand by considering personality fit of a laptop stand. Regarding the final decision based on symbolic value, the participant said that "And this looks a bit younger and trendier. Maybe I hope to see as I refer myself more to that group than the nerdy techie group.". 6 of the subjects indicated that they do not prefer a cheap looking laptop stand. However, only two them based their final purchase decision on not cheap look of a laptop stand.

6.1.2. Influence of contextual factors

In the experiment, **product images** played a significant role in consumers' decision-making process. While some of them based their final purchase decision on them, some others used them as an evaluation criterion in digital platforms. The product images were perceived as an information source in online platforms by the significant majority of the subjects (%93 of the total, 40) (figure 34). Twenty-three subjects mentioned that they understand main product functions through the images, whereas 12 of them indicated that in-context images have a high added value in understanding the use of the product. One subject said, "Well, I like the images with the laptop on it because then you really get an idea of how you're going to use it yourself when you're at home.". On the other hand, two participants mentioned the difficulty in empathizing with some in-context images. While choosing a laptop stand in the experiment, to describe the difficulty, one participant stated,

"And but to me, this doesn't really add that much. I like this one better, because in the picture they have such different style than I would have in my house, that it would actually negatively affect me.". 6 of the subjects also emphasized that it is challenging to recognize transparent objects on the images as evaluating different laptop stand alternatives. Additionally, around %25 of the participants mentioned that the product images communicate about dimensions, weight and material quality of the product, and they indicated a higher number of high-quality product images allow them to get a better impression on products in digital platforms. Several subjects said that viewing and interacting with the product images can substitute the feeling of touching the product itself in digital environments. One subject elaborate that as follows: "Yeah, sometimes you really want to see kind of close up. Yeah, it makes me feel like I'm closer to the product.".



Besides the informative function of the product images, 16% of the participants (7) mentioned that they associated product images with the perceived risk in online environments. 2 subjects indicated that the cut-out product images, product images with a white and plain background, make them trust to seller or manufacturer of the product. One subject explained how she perceived cut-out images as follow: "I mean in general if the pictures are almost the same here, so you have this transparent white background, I like this. It looks like you know, somebody took the time to take a good photo.". Almost 10% (4) of the total sample told that they have trust issues with low-resolution product images. Two participants indicated that they prefer a high number of images to perceive less risk in their purchase. One of them stated, "Well, usually if a website only has only one, I go away. I don't like it. Because it seems like they're hiding something or not trustworthy. And I feel if they don't put into the effort to make a nice website and how can trust the product sold by them? Yeah, so I like to see more things because it is like that we are proud of this product. It's a good product.". Even though the majority of the participants reflected their thoughts on role product images in online shopping, only 15 of them considered it as a product purchase criterion for the category of laptop stands (figure 34). Even a smaller number of participants, (6) thought about it as evaluating the headphones in the experiment. Product images presented in the experiment played a role as a product evaluation criterion with its informative function in 9 subjects' laptop

stand shopping experience and two subjects' headphone shopping experience. One explained how he eliminated some laptop stand alternatives based on the informativeness of the images as follows: "Because I don't know how it works. So, I will not choose this one as first preference.". 8 of them based their final purchase decision in the product category of laptop stands by considering informativeness of product images, while only one participant made the final decision based on it as purchasing a headphone. One participant explained his final purchase decision on a laptop stand as follows: "I think I will go for this one because I can see how it is holding my laptop. I think the picture really helped because I could see myself as using it.". On the other hand, three subjects showed product images with good quality, high resolution, and right angle as a purchasing decision in headphones, although all product alternatives had the same amount of high-quality (≥ 300 dpi) images in the test site. As oppose to headphone product category, none of the subjects purchased a laptop stand based on the image quality, although three subjects considered it as reviewing the laptop stand alternatives (figure 35).

Moreover, some **functions of the e-commerce website** designed for the experiment influenced participants in making a purchase decision. One participant considered product ratings as choosing a laptop; six subjects took them into account to evaluate different headphone alternatives. One subject said, “I see it has four stars with 83 reviews. Seems reliable. Makes me feel like it would be a safe purchase at least.” to describe how ratings decrease perceived risk in online purchases. However, none of the subjects based on their final purchase decision in any of the

product categories in the experiment (figure 35). Besides the product ratings, technical information presented on the website was mentioned by one of the participants. The participant, who based his final purchase decision on the headphones, explain his decision as follows: “And also, I think this was the first one that really gave me some technical information. So, my final decision will be this.”. On the other side, technical information provided by the website was not mentioned even once by any of the participants as choosing a laptop stand.

consumer responses to themes in online shopping when purchasing a headphone

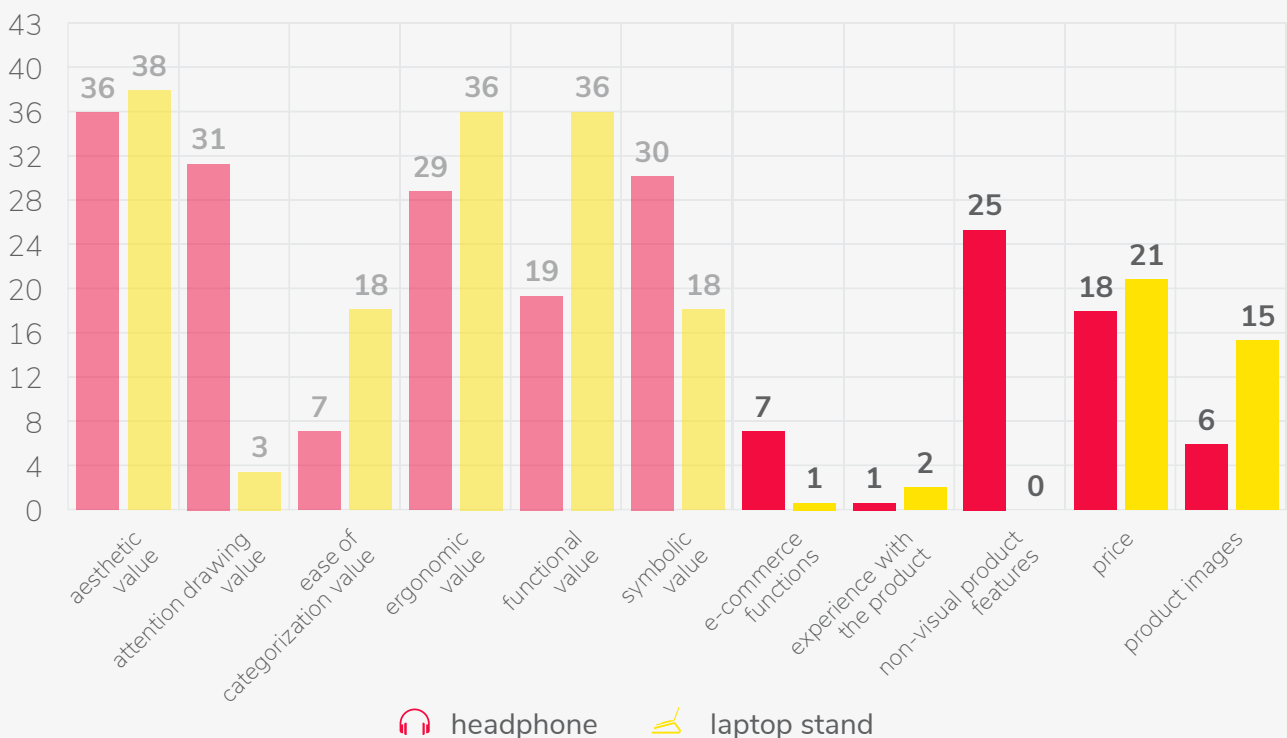


Figure 34 Contextual and non-visual product attributes influenced participants' purchase behaviors in the experiment.

6.1.3 Influence of non-visual product attributes

During the experiment, the participants responded to some no-visual product attributes, such as non-visual functional product attributes, price, brand, or their personal experience with the product. **Product price** was one of the mentioned one among all non-visual product attributes. It was considered by more than %40 of the total sample (18) as purchasing a headphone and 21 of them as choosing a laptop stand (figure 34). One participant mentioned that low price is associated with low aesthetic quality, whereas another one stated that the frequency of product use should

determine the price tag. By %16 of the subjects, the price was perceived as a sign of quality as evaluating headphones in the experiment. One subject explained how he could be sure about the quality of the product as follows: "I think if I'm buying a product that is above 100 euro, I think it's going to be good anyway.". Although price played a more prominent role in participants' product evaluation process for headphones, in the end, an equal number of participants (10) based their final purchase decision on price.

decision making based on the themes in online shopping as purchasing a headphone

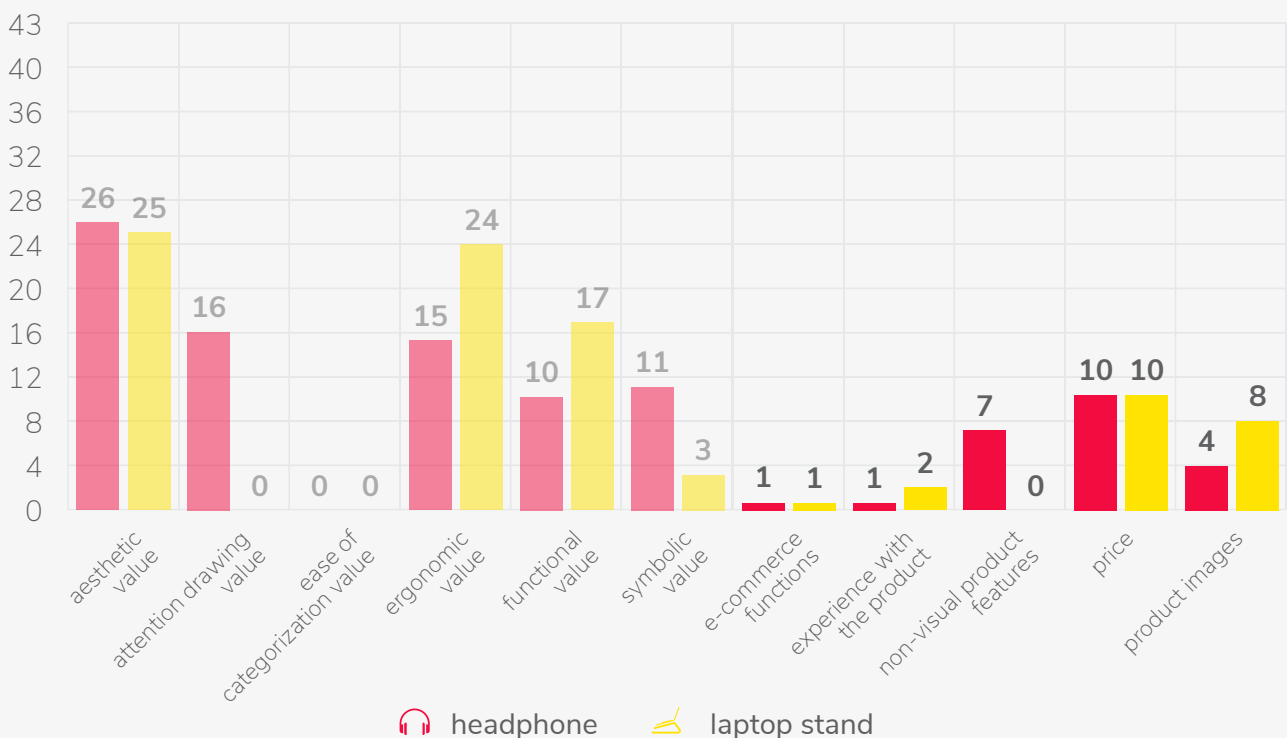


Figure 35 Almost ¼ of the participants made their final purchase decision by considering price in both of the product categories.

Some **product functions which are not visually recognizable** influenced the subject while performing the task of purchasing a headphone. %30 of the subjects preferred a noise-canceling headphone, whereas three subjects looked for a headphone with good Bluetooth connection standards. Also, several participants paid attention to the battery life of different alternatives and compare the battery hours written in the product descriptions with each other. Twelve of them also considered sound quality as choosing a headphone during the test. According to 7 of them, their final decision was based on the non-visual functions of headphones (figure 35). On the other hand, these attributes were never mentioned by any of the subjects as choosing a laptop stand in the test.

The brand was also one of the concepts mentioned by the participants, even though none of them shopped a product by considering it during the test. Twelve of the participants said that the brand is a sign of quality in the product category of headphones. One, who related the brand to excellent sound quality, said, "Because my correlation that sound and music is always associated with the brand.". Also, one subject mentioned that brand has a role reflecting one's self-image when he was asked to explain the importance of brand for him in online shopping. A few respondents (3) chose products that they previously used or possessed. One of them elaborated on his decision based on his experience with the product as follows: "So I think I am comfortable to say I would say despite this one because I know that works well."

6.2. Limitation of the results

In the experiment, participants were asked whether they found the test setting realistic. While all participants indicated that the setting was realistic for them, still they made some comments on the ways the experiment differed from how they do it in their daily life. %80 of the participants mentioned that they interact with more website functions as doing online shopping in their daily life than in the experiment (figure 36). More than one-third of them said that they would check the customer reviews if they were purchasing the items in real life. Almost %25 of

them expected to see some brands visible on the test website. One of the participants said, "I don't see any of the brands here. So that is for me quite a missing thing." to emphasize the importance of brand as shopping online for him. Some of them missed the product specifications as well. They said that they prefer to check product specification in the table format as shopping online rather than reading the product description. Also, a couple of them indicated that they would like to see product related information in video format.

While some participants would like to access product information through channels different than text, some others, almost one-third of the sample, found overall product related information presented in the platform insufficient. Additionally, 15 of them mentioned that they would purchase the items online if there were another experiment scenario. For example, some of them said that they usually would visit different web sites to see more information or make a price comparison if the experiment task allowed them to do so. Addition to the need for checking different websites, %20 of the participant said that they usually would spend more time and thought

as making an online purchase of headphone or laptop stand. Moreover, the limitations of online shopping were mentioned as constraints of the experiment task. For instance, around one-third of the responded indicated that purchasing the test items was difficult for them due to lack of product tangibility in digital platforms, whereas a small number of them pointed out trust issues in online shopping as difficulty in performing the test task. Furthermore, %20 of the participants (9) mentioned that they would visit a store to purchase the products chosen for the experiment in real life.

the limitations mentioned by the participants

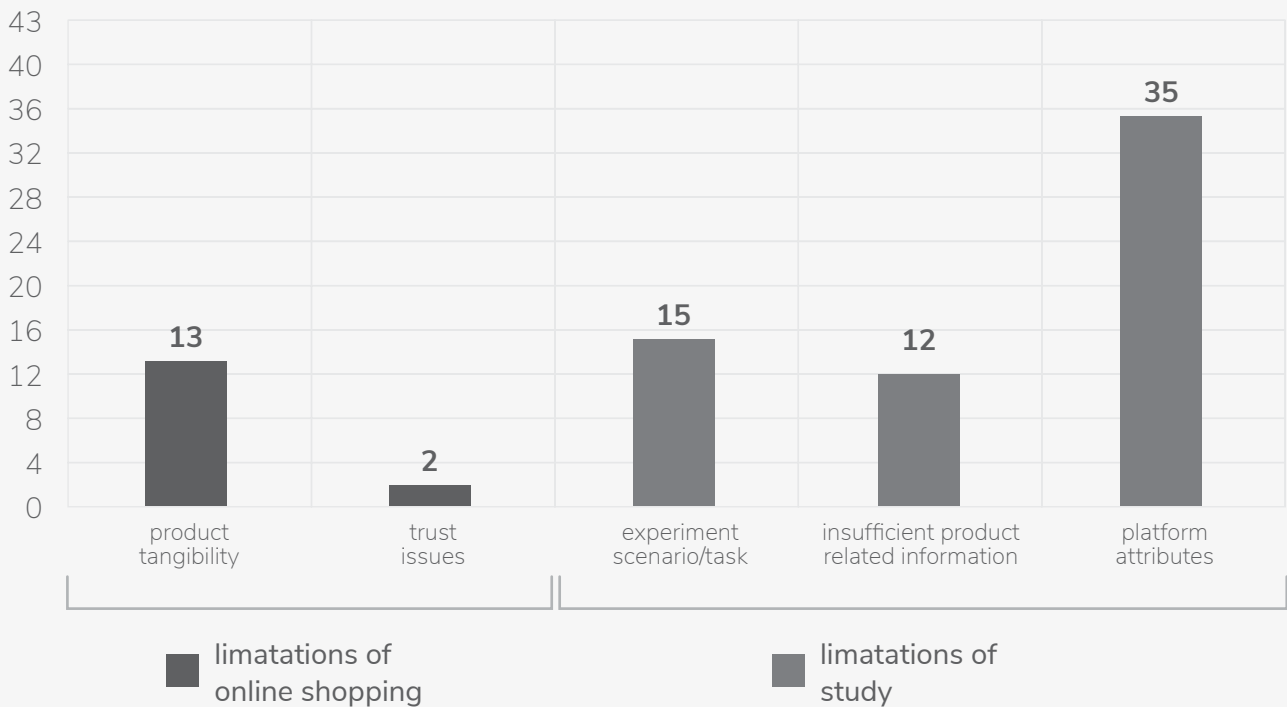


Figure 36 Result of the study is restricted because of the limitations of online shopping and the test set.

6.3. Reliability of the results

In both parts of the experiment, purchasing a laptop stand and a headphone, participation of the subjects was satisfactory. The participants evaluated their decision of purchasing a laptop stand as moderately important (2.74/5), whereas this decision did not require a lot of thought for them (3/5). Also, purchasing a laptop stand did not sound like an irrelevant decision for many of the respondents (3.88) (figure 37). Overall, shopping a laptop stand online required moderate involvement for many of the sample except two participants scoring 1. These participants never responded symbolic value of the product form different than the majority. Similarly, even images of the least purchased or never purchased laptop stands were viewed by the participants (figure 38). Also, a significant relationship was found between the product involvement in laptop stands and response to attention drawing the

value of product form, $\chi^2(3) = 7.903, p < 0.05$ (Appendix H: Data analysis in SPSS). Compare to a decision on a laptop stand, decision a headphone requires more involvement for the majority of the respondents (3.9/5). For the participants, the decision-making process of purchasing a headphone required some thought (2.74). Also, it was quite a bit important (3.88/5) and relevant 43decision (3.88/5) for the subjects. The number of product images checked by the participants proves their interest in the experiment (figure 38, see the next page). The statistical analysis showed that there is a significant relationship between product involvement in headphones and consumer responses to the functional value of product form, $\chi^2(3) = 8.012, p < 0.05$. Any correlation between the number of purchases and the number of product images checked per product by the subjects was not detected.

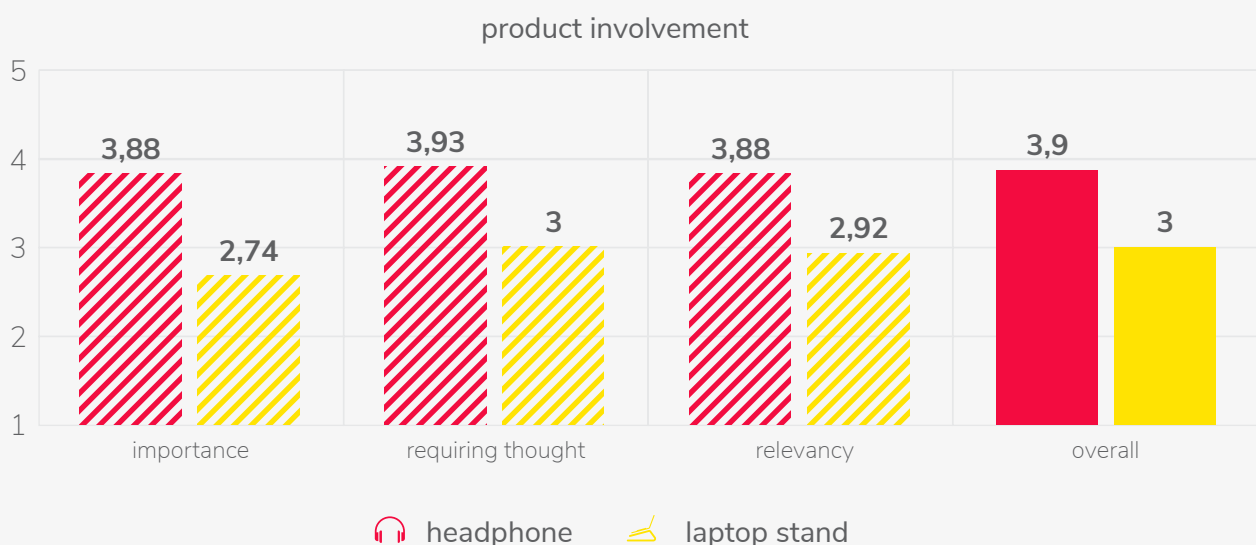
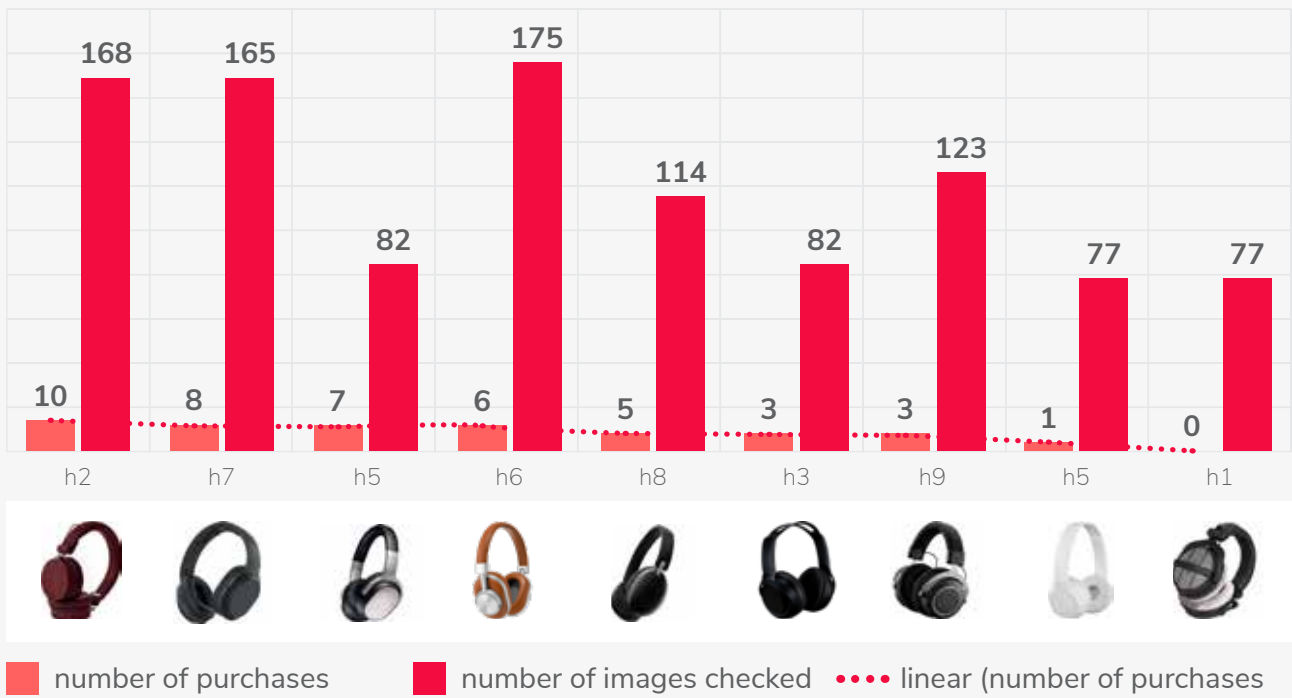


Figure 37 Purchasing a headphone requires more thought than purchasing a laptop stand according to the participants.

participants actions during the task of purchasing a headphone



participants actions during the task of purchasing a laptop stand

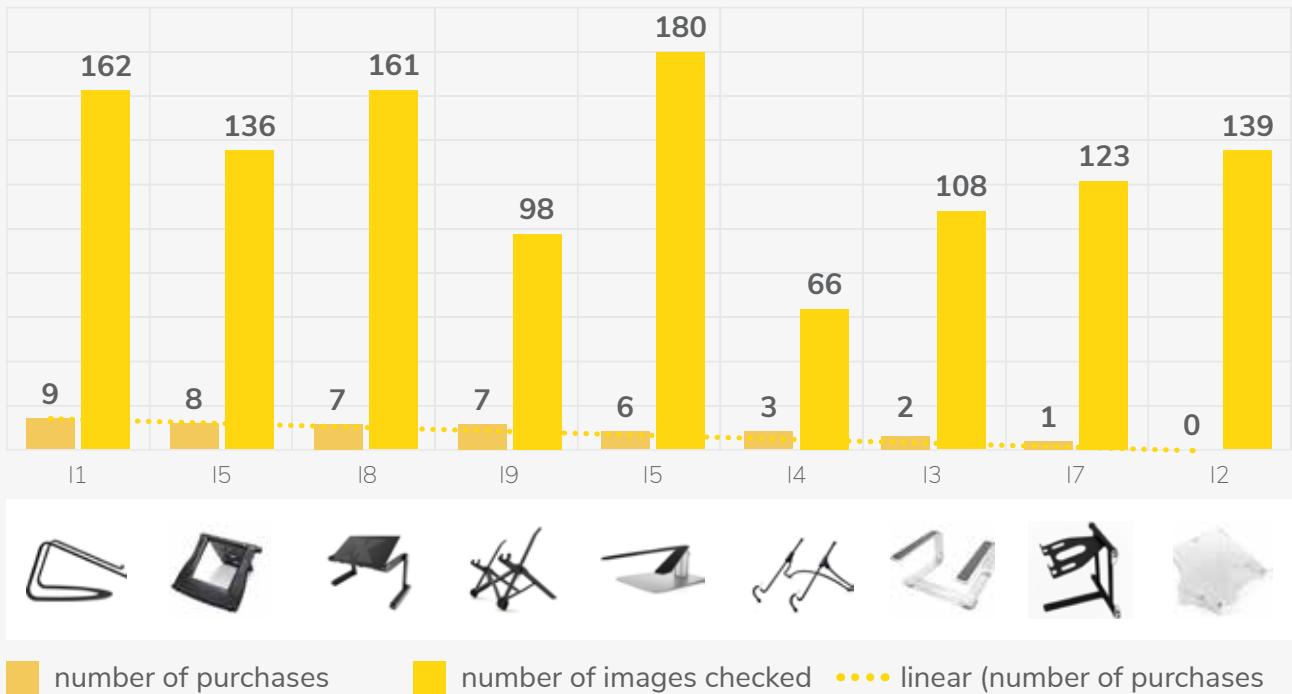


Figure 38 Any relationship between the number of purchases and the number of product images checked by the subjects could not be recognized.

7. Discussion & Conclusion

In this experiential qualitative study, the role of the product appearance in online purchases aims to be examined. In this chapter, the main findings of the study are described by linking them to the existing literature. Next to this, research questions, presented in chapter 4, are answered in a limited extent, since the research questions are rather general to make a to be fully responded. Lastly, a small travel in time is done to see what's changed in last 20 years in the role of product appearance in consumer choices after Marielle Creusen and Jan Schoormas's study called "The different roles of product appearance in consumer choice".

7.1. Research questions

The experiment findings show that all six roles of the product appearance indeed do exist in consumer' product evaluation process in digital environments, although the extent of this influence on the consumers differs in different product categories. In the study, while the product appearance roles were often called as product evaluation criteria, sometimes they were pointed out as a reason for purchase by the participants. Also, the roles were described in different ways by the participants for different product categories.

→ **RQ 1** **Whether the different roles of product appearance exist in consumers' process of product evaluation in online environments.**

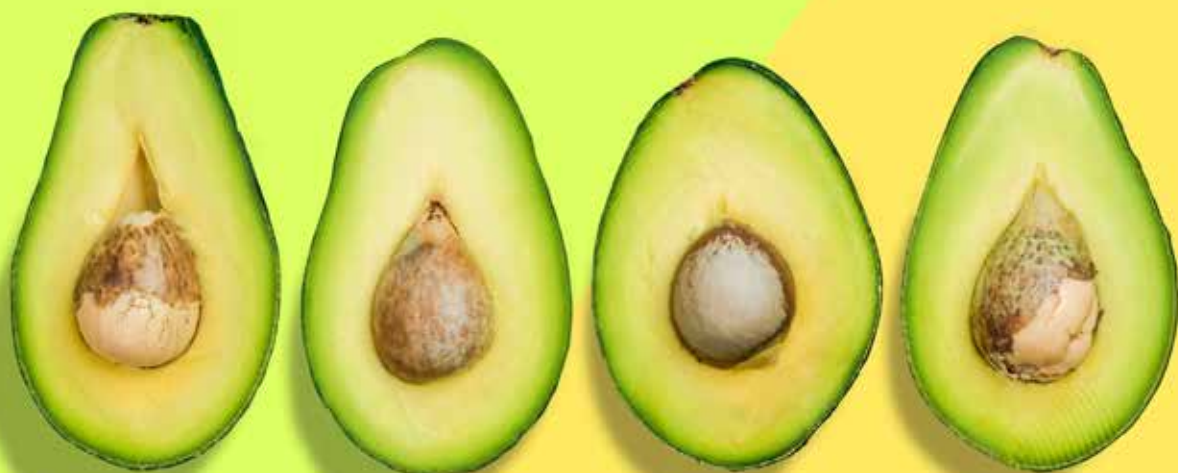
→ **RQ 2** **To what extent these roles influence consumer product evaluation in online environments.**

Unsurprisingly, **aesthetic value** played an essential role in the majority's purchase decision process for both product categories. The consumers' high response to the aesthetic value of the product form was an expected research outcome since earlier the literature review argued that the consumers often expect the aesthetic products have superior functional attributes than the aesthetically unappealing ones (Han, Wang & Gao, 2016). When it is considered that both product categories presented in the experiment have utilitarian character, consumers' desire to purchasing the most functional one is relatable. Another explanation for this outcome can be that aesthetic value has a high impact on consumers as purchasing durable products, like headphones or laptop stands, because the durables are often used for long periods (Creusen & Schoormans, 2005). Next to that, the research results suggest

that aesthetic value has more impact on the consumers' purchasing decision on headphones than laptop stands. This difference in the impact may be caused by the fact that headphones belong to electronic product category, in which a product's functions degrade rapidly with the technological developments. Supporting this view, Bloch stated that consumers give value to aesthetically appealing products, even if their functionality is degraded (1995). Therefore, choosing an aesthetically appealing headphone may be seen as a strategy developed by the consumers due to practical reasons. Also, the results show that participants sometimes brought the aesthetic role to another level, the reason for purchase. However, any factors determining this change in the role of aesthetic value could not be found in the statistical analysis (Appendix H: Data analysis in SPSS).

Attention drawing value was mentioned by many of the subjects as purchasing a headphone. This finding can be explained by the analogy, between headphones and fashion accessories, created by the participants to explain their perception of headphones as a socially significant product. During the experiment, many subjects mentioned that they perceive headphones as a fashion accessory which needs to suit their style and identity. Therefore, many of them were concerned about the color and size of the headphones in order either not to look strange when they “wear” it or to catch attention of other people. Perhaps, because of the same reason, only a few consumers respond to attention drawing the role of product appearance for the category of laptop stands. In other words, since laptops stands are not especially socially visible products, there is less of consumer concern regarding attention drawing value of the product form.

Ease of categorization value was considered by the respondents not so much for the headphones compare to laptop stands, although a different result was expecting. Based on the literature review, it was expecting that consumers would talk about typicality or atypicality of the headphones since there are a big competition and many fake products available in this product category. Maybe a limited number of product alternatives available in the experiment website extinguished the potential influence of competition within the product category. Consequently, the results showed that ease of categorization value was not so crucial for participants for headphones. On the other hand, it was mentioned by more than %40 of the participants in choosing a laptop stand between different alternatives. A reason for this outcome can be that the laptop stands are not popular products among the majority of the people. Thus, the participants may tend to choose the most “laptop stand” looking one for



themselves during the experiment. However, still, this is not more than the researcher's observation because none of the participants mentioned it during the experiment. Also, surprisingly, none of the participants show the ease of categorization value as a reason for the final purchase decision, even though it was considered by 18 subjects. However, any statistically significant relationship between response to ease of categorization and other variables, like contextual factors or other roles of product form, could not be obtained (Appendix H: Data analysis in SPSS).

More than half of the participants responded to **ergonomic value** of product form in making a purchase decision in both product categories. Two different explanation for this research result can be made for each product category. First, headphones are in physical contact with the consumer. Thus, ergonomic of the product is an important consideration for this product category.

Similarly, the findings are also saying that %40 participants (17) mentioned the importance of physical contact of the headphones with the body as evaluating the ergonomic value of headphone alternatives' appearance. Next to that, seven subjects indicated that product images are helpful in terms of understanding how the headphone would fit on them as performing the task of purchasing a headphone, while it was never mentioned for the laptop stands. Second, the participants might consider ergonomic value frequently as choosing a laptop stand because laptop stands often have a visible mechanism which may make them think about ease of use of the product. Supporting to this, 10 participants mentioned that they do not prefer complex shapes and mechanism since they cannot communicate on product usage. Also, a big majority of the group (19) who responded ergonomic value notably indicated that the prefer laptop stand should be easy to install.

“ I just don't like it.
It looks like it's an **air conditioner!?!**”

More than %80 of the subjects derived **functional value** from a form of the laptop stand alternatives, whereas %44 of them considered it as purchasing a headphone. During the experiment, the participants aimed to find out the most robust looking alternative through the product images representing functional attributes of products, like weight and size, in both categories. 10 participants specifically mentioned that they use product images as a tool to understand the dimension and weight of the laptop stands in the furtherance of this aim of the participants. This finding also supports Creusen and Schoormans' study stating that product presentations may suggest the functional features, such as weight, size, etc., of the product illusively (2005). Similarly, a few participants derived functionalities of laptop stands from the shape of the products. For example, they mentioned that inclined surfaces make them think that their laptop can easily slip and fall from the laptop stand.

On the other hand, the functional value was not considered less by the subjects for the category of headphones, compared to the laptop stands. This may be caused by the fact that many subjects (%58, 25) considered non-visual product features presented in the product description part of the test website as purchasing a headphone. Perhaps, non-visual product features, such as battery life, Bluetooth connection, noise cancellation, and sound quality, played a more prominent role in consumer's product evaluation process in the category of headphones than the functional value derived from the product form. On the other hand, the analysis showed that there is a significant statistical relationship between the functional value and consumers' interest in purchasing a headphone, $x^2(3) = 8.012, p < 0.05$. The consumers, either highly or very highly involved in the task, usually gave much importance to the functional value of the appearance of headphones (Appendix H: Data analysis in SPSS).

“ So if this one gets folded.
Then maybe the sound will be
distorted once it is folded.

In contrast to the functional value, the **symbolic value** was mentioned by %70 (30) of the participants for the category of headphones while it was taken into account by %40 (18) as purchasing a laptop stand. The difference between the role of symbolic value in laptop stand purchases and headphone purchases was somehow an expected research outcome. This is because the headphone is a socially significant product which allows its user to manifest her/his identity or ideal image to other people (Creusen & Schoormans, 2005, while laptop stands are not. Also, 15 subjects mentioned that they see headphones as a fashion accessory, like a lifestyle product in the experiment. Therefore, expectedly, the subjects set purchase criteria for headphones, like should fit my style, to be able to represent me and not looking cheap, regarding the symbolic value of product appearance. On the other hand, 18 participants mentioned the symbolic value of the product form of laptop

stands during the experiment. This unexpected research outcome may be caused by the potential influence of in-context product images in the test platform. The literature review, done earlier in the study, suggests that the product images in the context promote the way the consumer perceives the symbolic value of the product forms. As considering that 12 participants mentioned the importance of in-context images in their online product evaluation process, it can be assumed that in-context product images increase the impact of the symbolic value of product appearance in online purchases. However, this assumption is not statically proven (Appendix H: Data analysis in SPSS).



→ **RQ 3** **Whether there are factors, like product related or contextual, influencing the consumer response to the product form in digital environments.**

→ **RQ 4** **How these factors influence consumer' response to the product form in digital environments.**

The research findings showed that some **product-related factors**, namely brand, product form characteristic, and product category, influence the consumer response to the product form values in digital environments. Although all brand logos and names were removed from the product images, still, **brand** and brand images reflected through the product form were considered by the participants. A sharp visual brand image was described as familiar or typical and, associated with ease of categorization value of the product form by the participants for both product categories. The brand familiarity of the product associated with ease of categorization value was shown as a reason for purchase once in each product category. On the other hand, seven participants mentioned brand as a product evaluation consideration as purchasing a headphone, but they added that they recognized the brand, not through the product form. They mentioned that they perceived the brand as a sign of quality the product category of headphones. This research outcome supports the claim that consumers prefer well-known brands to cope with the perceived risk as shopping durables that

are often expensive and used to demonstrate the social status of the owner, like headphones (Fischer, Völckner & Sattler, 2010).

Product form characteristic influenced participants' response to the form of product alternatives in different ways during the experiment. Subjects appreciated product forms having unity and low complexity in both product categories in furtherance of the claim people see value aesthetically in the products forms having low complexity, high symmetry, great unity, and right proportions (Creusen & Schoormans, 2005). They named this type of forms as simple forms and perceived aesthetic value through these product forms. Overall, 15 subjects consider aesthetic value perceived through the simple product form in their purchase decision of laptop stand, whereas this number is 8 for the category of headphone. For the headphones, more than half of the participants had criteria on the color of the product. They suggested that color is an essential product characteristic to see aesthetic value in the product form.

Next to that, a few subjects preferred headphone with big ear cups since they believe that big volumes can give good sound quality. This consumer belief corresponds with the claim that consumers perceive large shapes as powerful and strong, while small shapes appear delicate and weak for them (Walker, Francis, & Walker, 2010).

Besides the perceived dimensions of the product, material selection in the product design made the participants perceive functional value in them. For example, transparent and plastic materials often seemed weak and low quality by the participants, whereas the use of leather in the product form made the product more durable for the participants. Accordingly, 8 participants consider product material as purchasing a laptop stand, whereas 5 of them mentioned it for the category of headphone. Also, typicality or atypicality of the product form influenced the subjects in their response to attention drawing value of the product appearance. For instance, around half of the participants would like to purchase

a headphone with a typical appearance. This might be a result of the fact that typical designs increase the functional and ergonomic value of the product appearance according to consumer perception (Creusen, 2015). However, still, this claim is not helpful to explain the low response to attention drawing value through typicality/atypicality product look for the category of laptop stands.

On the other hand, the **product category** had an impact on the participants during the test. It was expected that the responded would give more importance to aesthetical value of headphones' form than the form of laptop stands. This is because it was earlier known that in the evaluation of the hedonic product, like headphones, sensory enjoyment is essential to consumers (Creusen, 2015). Also, consumers looked for the aesthetic value of product form as purchasing electronics, since even if their functions are degraded they can still enjoy with the product form (Han, Wang & Gao, 2016) (Bloch, 1995).



Some **contextual factors** unique to online shopping environment played a role in consumers' response to product appearance. **Visual product representations**, product images, were seen as a channel conveying the functional and ergonomic value of the product form by the majority of the participants for both product categories. The participants mentioned that the product images help them to understand dimensions, weight, material quality, components use of the products. Some of them (around 7 for both product categories) also expressly indicated that a high number of products with good resolution is better in terms of communicating the functional and ergonomic value of the product form. Next to that, product representations in use context potentially create an impact on participants response to the symbolic value of product form for laptop stand product category. This is because participants consider symbolic value surprisingly frequently as purchasing a headphone, and they

mention the importance of in-context images in online purchases at the same time. However, the relationship between the importance given into the in-context images and the responses to the symbolic value is not statistically significant (Appendix H: Data analysis in SPSS). Also, the influence of **device interface** was mentioned by one of the participants. The participant navigated the website with a touch interface, said that "Yeah, it [zooming in to the image with the touch interface] makes me feel like I am close the product." It was initially assumed that direct touch device allowed the participant to understand the tactile properties of the product form better.

Finally, any consumer type related factors could not be found in results of this experimental study, because of limited sample and experiment setup in general. All limitations of the study are described in detail in the limitations chapter.

7.2. Contribution to the literature

This qualitative research was designed as a follow-up of the study "The different roles of product appearance in consumer choice" published in 2005 by Marielle Creusen and Jan Schoormas. Both studies investigated the role of product form in consumer purchases; their set up was different from each other yet. In the earlier study, the participants made a purchase decision between two telephone answering

machine in a laboratory setting, like an in-store setting, whereas the subject decided on two different objects presented in a digital platform in this study. Despite some differences between the studies, it is still valuable to travel in time and explore whether the consumer' psychological and behavioral responses to the product form changed within these past 20 years.

Compare to the previous study, different roles of product appearance were mentioned more by the participants in the recent study (figure 39). Majority of the participants mentioned three or four roles in the current study, whereas the participants usually talked about two roles in the study of Creusen and Schoormans (2005). However, still, it is not fair to say the product appearance has a more significant influence on the consumer purchase decision now than twenty years ago, primarily because the test objects used in each study were different from each other. Therefore, the extent of the influence in different periods cannot be compared, but the way that the consumers respond to the product form in these two different studies can be still compared and discussed.

The aesthetic role seems like it is still the most motioned product appearance role as a choice

reason and perceived by the consumers in the same way as the previous study (figure 40). In both studies, the participants associated simplicity, unity, and continuity in the product form, with the aesthetic value of the product form. For example, some participants of the early study mentioned that they prefer a product in one color as opposed to multiple colors (Creusen & Schoormans, 2005).

Likely, more than half of the participants liked the products looking like “a whole”. Additionally, the aesthetic value of the product form was perceived through the product color in both studies. In the current study, %13 of the subjects purchased a headphone because of the color of the object, while %22 of the sample preferred a particular color because they like it better or it fits into their home environment while choosing a telephone answering machine in the early research.

product form values as a reason for purchase

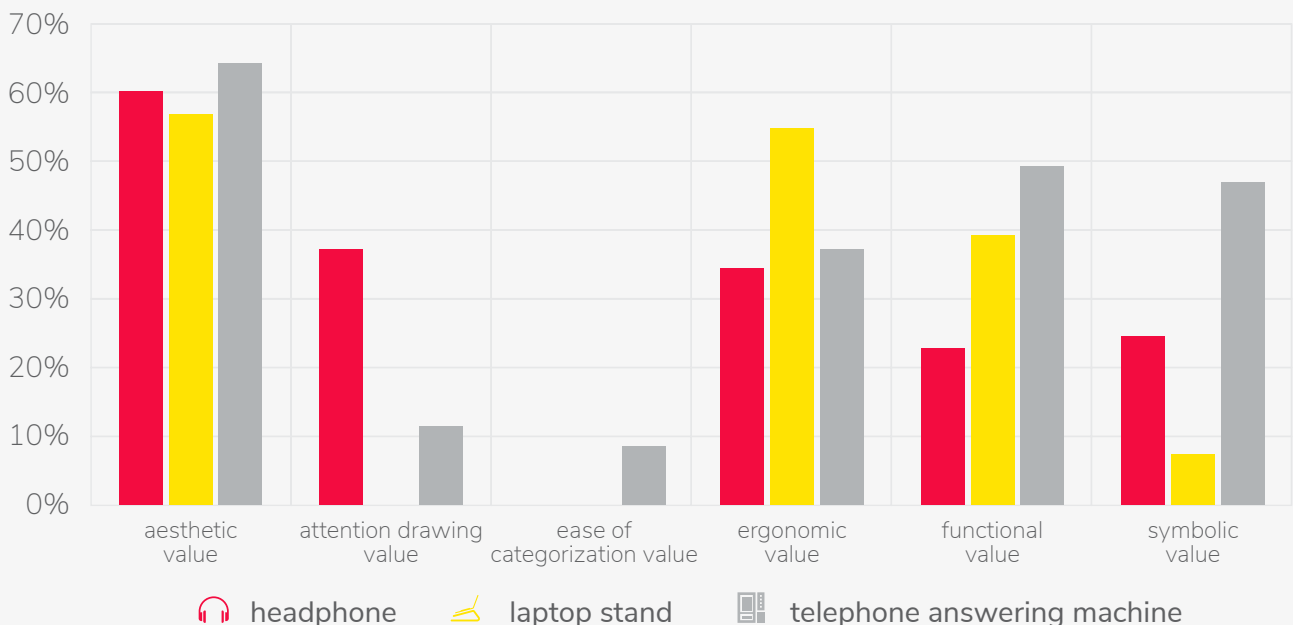


Figure 40 In the current study, none of the participants based their final purchase decision on ease of categorization value.

In this study, the participants also mentioned the importance of aesthetic fit of the product appearance into its use environment. Also, small and compact forms were found aesthetically appealing rather than big and bulky ones by the participants of both studies.

Both attention drawing and ease of categorization value were not mentioned so frequently as a choice reason in both experiments. However, it seems like the subjects' way of describing these values did not change a lot over twenty years. For example, the participants went for a neutral colored product, such as black or gray ones, when they wanted to purchase a less attention drawing product option in the previous study like the current one. On the other hand, the participants mentioned the extent that a product can visually reflect its category to express their thoughts on the ease of categorization value of the product form in both cases. For instance, some participants discuss whether an alternative looks like a CD player or a telephone answering machine in past research. Similar to that, in the recent experiment, some participants mentioned that some products presented on the test website seem like an air conditioner or a forklift. Different than the earlier study, some subjects mentioned brand image as describing the ease of categorization value in the current one.

The participants described the ergonomic value in similar ways in both studies. While the subjects mainly mentioned operational aspects through the size, number, clarity, or placing of the buttons in the previous research, the product mechanism was usually mentioned by the subjects to indicate the ease of use of the product in the current

research. In both studies, the consumers thought about transportability and storage of the product alternatives based on their visual design. It seems like compact products are still perceived as ease to use by the consumers after twenty years. Similar to ergonomic value, functional value is still an essential purchase criterion for the consumers. This recent study shows that the participants still perceive functional value from the products having stable and robust forms since they believe that they can use this type of products for a long time, similar to the earlier study. However, their way of describing the robust form show differences between the studies. For example, while the subjects often mentioned the shape or techy look to describe robustness of the form in the previous study, participants of the current study often mentioned the material quality and mechanism of the product in addition to the other aspects to elaborate sturdiness of the form.

Last, surprisingly, the symbolic value was not mentioned by the subjects in the recent study as much as it was mentioned in the earlier study. Although the participants described the symbolic value in similar ways in both studies, fewer participants based their final purchase decision on it in the current one than the previous one. Perhaps, it is a cause of different test settings used in the studies. It may be assumed that symbolic value of the product form has more influence on offline purchases rather than the online ones, although it is not possible to make a final judgment on this topic because of the differences in the studies.

number of product appearance roles considered by the participants

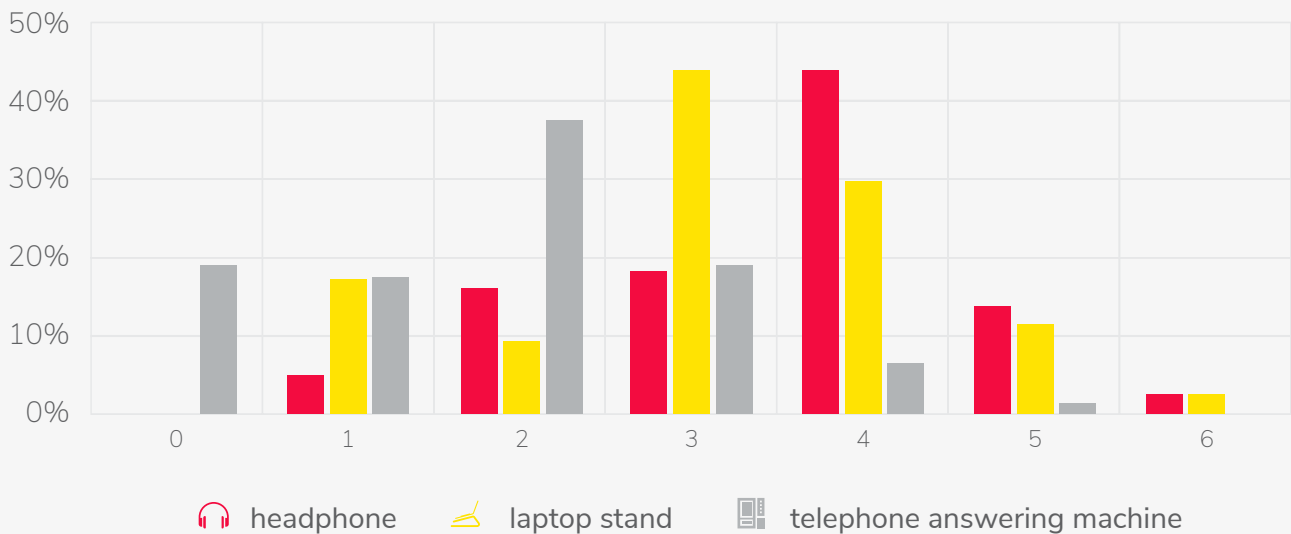


Figure 41 Compare to the previous study, the participants considered higher number of product appearance roles in the current study.

To begin with, all research findings are context depended due to the nature of qualitative research. Therefore, the results do not apply to all online purchases. Also, the limited sample size is another factor which does not allow to generalize the research outcomes. Since this study is a master graduation assignment, it took place in a limited time and with limited resources. Thus, the sample size could not be extended, and the variety in the sample could not be achieved. Participants of the study, below 40 and mainly having a design related educational background, cannot represent the whole group of online shoppers. As a result, consumer type related factors which have potentially an effect on consumer responses to product form could not be identified, even though it is an important factor to understand the context of online purchases. Transferability of the study can be extended by taking a snowball sampling approach or merely increasing the sample size in the future.

Also, the experiment setting could not imitate online shopping context in real life because of the limited time. Only two product categories with nine product examples could take place on the test website. Further research may include a high number of product categories and examples to have a better overview of how product form influences consumer purchases in digital environments. Besides the limited number of product alternatives, some user interface elements usually existing in e-commerce websites, such as recommendation agent, product reviews, comparison agent, wish list, product color options, were excluded from the study. The test website was kept simple to minimize research variables to be analyzed with 20 weeks of the master graduation project.

Also, the influence of the device interface, as a contextual factor, could not be investigated within this research because only a touch interface was used by the participants to navigate the website. This was, again, a conscious decision made to limit the scope of the research. If the scope would like to be extended in the future, all UI elements can individually be assessed by the sample. Also, the influence of device interactivity, direct or indirect touch, on the consumers as interacting with the e-commerce platform needs to be further researched in the future, since the variety of the interfaces are overgrowing with the new technological developments. Thus, how the consumer interacts with the e-commerce website will determine a lot how the product form is influenced in the near future.

Furthermore, brand logos and names were removed from product images so that they could create a limited impact on the participants. Again, the reason behind it was the same as simplifying the website. Therefore, the study findings are limited in terms of identifying the influence of the brand on the consumers' responses to product form.

On the other hand, a limited number of transcripts were inter-coded since this study was primarily under the responsibility of the master student. Although the coding process was iterative and took place usually with the guidance of the supervisory team, the analysis may include some researcher biases. In the future, the raw data can be coded and analyzed by many researchers to increase the confirmability of the analysis.

8. Limitations & Further research

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9. Recommendations

9.1. Product design

While the number of online purchases is growing up day by day, product designers should be more aware of how product design can potentially affect consumer perception. Findings of this study will hopefully make them better understand how consumers respond to different roles of product appearance in digital environments. Beyond extending their knowledge, the study can give guidance to designers to strategies their designs, especially for the digital market.

For example, the aesthetic value of product form played an essential role in the consumers as purchasing a headphone probably because the consumers expect aesthetic products have superior functional attributes than the aesthetically unappealing ones. Therefore, the designers can put more effort into the aesthetic quality of product form, when they design a utilitarian product to emphasize its functional feature more. Also, they can keep in mind that simple designs, having great unity and continuity in the form, seem aesthetically appealing to

many consumers. On the other hand, wearable electronics may often be associated with fashion accessories. Thus, product designers should concern symbolic value and attention drawing the value of product form as developing a product within this category. The ergonomic value should also be a consideration for designers as designing wearables because these products are often in touch with the body.

The designers should also think about the ergonomic value of product form as designing objects with the visible mechanism. These objects catch consumers' attention to their ease of use. Similarly, many participants mentioned the ease of use value as pointing out the object's mechanism in the experiment. On the other side, ease of categorization value may require more attention from the designers for product categories having no archetype, like laptop stands. This is because, many subjects emphasis ease of categorization value as evaluating different laptop alternatives, since it was hard for them to understand what is

9.2. Product representation in digital environments

Based on the findings of this study, some recommendations on product representations in online platforms can be made. The study shows that product images have a massive impact on the consumers since almost all they use the images as a primary source of information. Beyond that, the findings suggest that in-context images are boosting the influence of symbolic value over the consumer for even utilitarian product categories, like laptop stands. Therefore, the in-context product images are capable of communicating

the lifestyle aimed to be provided by even a non-socially significant and utilitarian product. Also, product images with high resolution and white background made the participant trust in the platform and product itself in the test. Besides giving trust, this kind of images can also better tell the functional qualities of the products in digital environments. As a result, different types of product images, cut-out and in-context, have extensive potential in the communication way of products to the consumers.



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