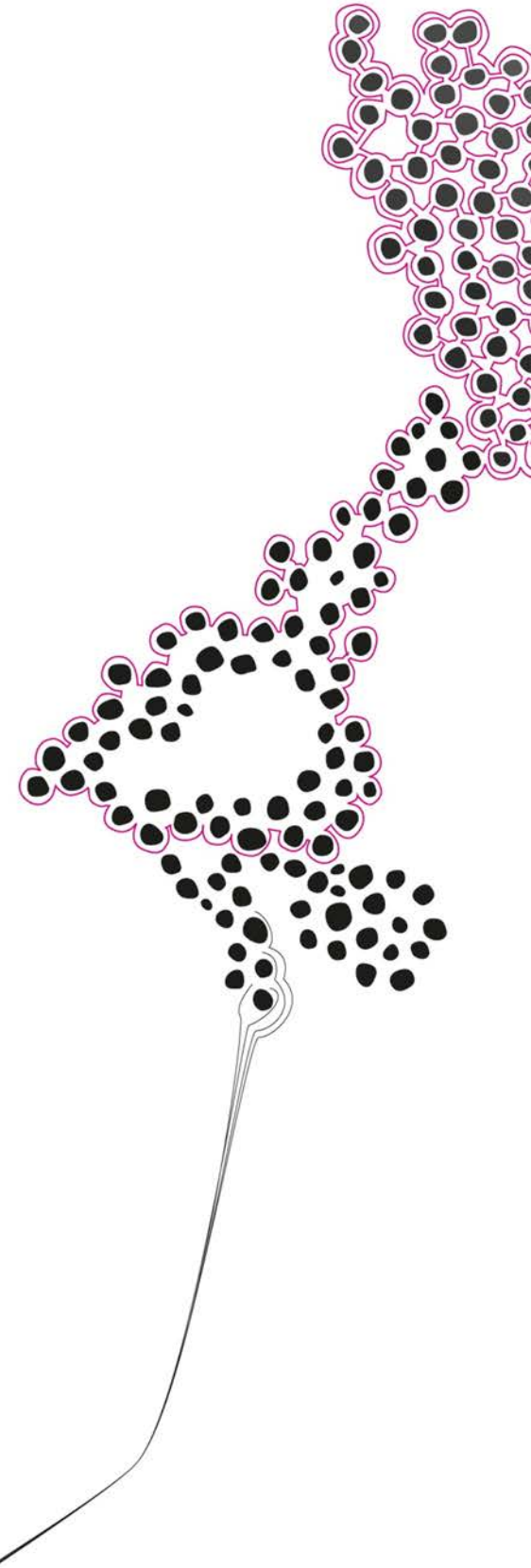




Human features and affectionate gestures: The influence of gender on product interactions and evaluations

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Abstract

As people are physically interacting with a broad range of (technological) products on a daily basis, the question comes up in what way this interaction is affecting the consumer–product relationship and how people evaluate products after performing gestures with them. Therefore, on the basis of prior indications, the purpose of this study was to gain new insights in the effects of meaningful gestures with anthropomorphized objects. A particular focus was thereby laid on the topic of gender by researching whether men and women respond differently when performing affectionate gestures with products that hold either masculine or feminine human features.

For this reason an online pre-test, validating stimuli, and an experiment with a 2 x 3 between-subject design were set up. 145 respondents took part in the study by performing an affectionate gesture with a product that contained either masculine or feminine human features, or no anthropomorphic features at all. After reporting their product evaluations on a questionnaire asking about the three constructs of purchase intention, product attitude and emotional attachment, a number of interesting findings came to the surface.

Among other things, it was found that consumers indicated higher levels of product attitude and emotional attachment when human traits were displayed on the object. The experiment further revealed that especially women responded with high ratings of product attitude when feminine features were present. Additionally, particularly feminine features were proven to induce the highest ratings when measuring the concept of emotional attachment.

All in all can be declared that this study was able to bring new knowledge and applications to the economic and scientific field by revealing gender differences in affectionate consumer-product interactions.

Keywords: Anthropomorphism, gender, consumer-product interaction, product evaluation

Acknowledgements

When finishing my secondary education in Germany, I felt the need to experience something new and exciting. By enrolling at the University of Twente, I was able to accomplish just that. In hindsight I can say that moving to another country was the right decision and that I have spent the best time of my life so far in this lovely city.

Now, after all these wonderful years in those I have learned so incredibly much, my study has come to an end. I would like to thank Dr. Sabrina Hegner for her constant support. Not only was she a great supervisor during my master thesis by helping me with all my problems, she was also able to respond with the fastest emails I have ever seen. Also, I would like to thank Dr. Mirjam Galetzka for her feedback and time she devoted for my study.

I am very grateful to my parents and the rest of my family, who have supported me during all my years of education, despite the long distance apart. Finally, I would also like to thank all my friends I got to know in Enschede, as they are the main reason that I will never forget this time of my life.

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1. Introduction

In our everyday life we experience and interact with a multitude of products. They help us by simplifying otherwise inconvenient tasks such as getting from one point to another. Through the use of bikes and cars for instance, people are able to save a lot of time when they are on the way to their jobs or when going shopping. On the other hand, often used products also fulfil the need for entertainment, such as smartphones or tablets. Society's current technological status has even reached a point at which the majority of people are not able to get through the day without some kind of device that connects them to the online world or assists them in the daily battle against boredom with music or games. Either way, we are more and more dependent on various products and even develop relationships with them, as can be seen in the case of how people treat their cars and even give them names. Yet, the question remains how specifically these relationships between living and non-living entities are created and under which circumstances they arise.

Brands all over the world hold a huge interest in this topic as they aspire to achieve the best consumer perception of their products. This can be seen in the tremendous amount of money that is annually spent on consumer-product related research. For 2013 the 'Ama Gold Top 50 Report' for the most revenue generating market research firms in the U.S. presented a total spending of \$10.7 billion for marketing/advertising/public-opinion related research (Gold, 2014). Taking inflation into account, this is a net growth of 2.1% compared to the prior year and is the highest since 2009. By offering new scientific insights this paper strives to provide relevant information for a broad scope of global players.

To get started, Hadi and Valenzuela were the first to be able to display the effects that result when people perform positive affectionate gestures towards inanimate products. In their article in the journal of consumer psychology (2014) they report that after hugging or stroking an object, participants reported higher product attachment and higher purchase intention. Surprisingly, this finding could only be seen if the object contained anthropomorphic traits (humanlike features) and the action embodied positive meaning. This means that just through the execution of an affectionate gesture consumer's product attributes were enhanced and certain human-product relationships were created.

As Hadi and Valenzuela stated the significance of anthropomorphic traits, it needs to be clarified that they merely displayed general human features such as comic eyes or the upper body of a man, but failed to apply diverse stimuli, which made conclusions about different kinds of features impossible. Because of this, the question remains whether men and women respond differently to hugging anthropomorphized products and whether the use masculine or feminine anthropomorphic features also lead to distinguishable results. Confirming effects about the existence of gender differences can be expected as a study by Putrevu in 2001 among others showed that men and women respond to and process marketing information in completely different ways. Hence, in contrast to Hadi and Valenzuela, this study concerns itself with the concept of gender in product performances and

evaluations. This means that not only differences in the participants' gender, but also differences in the anthropomorphic traits' gender will be investigated.

Insights in this particular field hold promising applications in product design and the general market economy. This is evident, as creating appropriate gender-based products has taken an important role in many areas. In the last 15 years, gendered brands like Dove or Nivea for example, were trying to expand their product line to the opposite sex while effectively using their existing resources to address the new market segment (Ulrich, 2013). New findings, about how people evaluate products with gendered human features after performing an affectionate gesture with them, will significantly optimize the setting up of new product designs. In addition, scientific evidence will enable brands to rethink their design and marketing communication of already existing products.

To give an example, just imagine that a study finds evidence that women respond particularly well to products that have masculine features (like a manly shape) after performing meaningful exercises with them. A producer of vacuum cleaners with a target group of middle-aged women could use this information to establish a new cleaner with emphasis on a masculine design. During the process of vacuuming different movements are performed and it becomes quite likely that the consumers attach additional value to the device after some sessions. This in turn will result in a more positive image of the brand and an increased likelihood to buy future vacuum cleaners from the same brand. On the other hand, the company could introduce an elaborated marketing campaign with a focus on an altered use of the product. For instance, the brand of the vacuum cleaner could air television commercials that show female customers dancing with the vacuum cleaner while cleaning. A corresponding message that advises the viewer to behave in the same way will encourage consumers to perform this very meaningful gesture instead of their ordinary cleaning behaviour. This in turn will also result in a higher product attitude and purchase intention because customers are more likely to establish a relationship with the product. With this example, two possible implementations are given that could prove to be beneficial for the brand.

As it can be seen in the previous example, successful findings in the proposed research study are able to improve the marketing communication of a number of companies. People are using gestures to engage with all kinds of products like smartphones or tablets. Therefore, this research will beneficially contribute to a broad range of public interests. Not only will it contribute to the marketing strategy of brands, but it will also offer new information for future research as the role of gender on product performances has not been sufficiently explored yet. This study has the ambition to generate new general insights about the effects of our daily interaction with products. Furthermore, this paper is aiming to answer the question whether consumers' gender plays a role in affectionate product interactions and how products with differently gendered anthropomorphized traits are evaluated after meaningful gestures have been performed with them.

In the following parts of this thesis the theoretical background and hypothesis are going to be addressed. Consecutively the methodology and results are illustrated, completed by the discussion.

2. Theoretical background

2.1 The meaning of gestures

An important aspect which comes into play when talking about haptic interaction is the concept of embodiment. It holds that primitive perceptual systems are the basis for higher order cognitions and emotions (Williams, Huang & Bargh, 2009). It has been proven that certain gestures have such a close connection to specific thoughts and feelings, that just by carrying out the motion, the individuals' mind processes are affected (Niedenthal, Barsalou, Winkielman, Krauth-Gruber & Ric, 2005). One basic example for this is the finding that when people are nodding their heads, a notion of 'agreement' is expressed and positive affect is created in the participating mind (Wells & Petty, 1980). Another demonstrating example is given by the study of Cacioppo, Priester and Bernston (1993). They observed that when participants were presented with novel Chinese ideographs while flexing their arms, they consequently reported more approving evaluations compared to the extended arm condition. This effect can be explained through the notion that arm flexing embodies an action associated with approach and arm extension embodies an action associated with avoidance. It needs to be stated though that informing participants about the specific motion they are going to perform significantly weakens the subsequent embodiment effect (Labroo & Nielsen, 2010). Nevertheless, it becomes clear that the concept of embodiment is involved in one way or another in almost every directed motion. When talking about haptic interaction, one also needs to differentiate between a simple motoric action, which results in a mere sensation of touch, and a real affectionate gesture.

As stated earlier, Hadi and Valenzuela elaborated this topic in 2014. They defined affectionate gestures as "those that typically stem from a disposition or state of mind driven by a feeling of fondness, as well as attachment, for a person". This means that affiliated gestures like handshakes, which are polite and even serve a social purpose, are excluded from this term as they do not imply a certain level fondness or emotional attachment (Sroufe & Waters, 1977). Therefore, it is more convincing to operationalize gestures such as hugging or stroking, as they are generally used by people to demonstrate affection in a physical way (Hadi & Valenzuela, 2014). It does not matter whether it is a child hugging a toy or an adult hugging another person, everyone is conscious of the meaning and the emotional value a hug represents.

2.2 The humanness of objects

When investigating the effects of affectionate interactions with objects though, one needs to keep in mind that these gestures are pro-human in nature. This means that complications could occur when performing them with non-human objects. To make respondents think of these objects in human terms, anthropomorphic features are needed to induce meaningful responses (Chandler & Schwarz, 2010). According to Chandler and Schwarz, people are led by anthropomorphic beliefs to treat objects as if they were alive.

Research has proven that people are especially likely to anthropomorphize objects if they possess certain human-like physical features like eyes for example (Haley & Fessler, 2005; Jipson & Gelman, 2007). The same effects have been found for objects that have hands (Woodward, 1999) or a humanly shaped form (Aggarwal & McGill, 2007). It is fascinating that just through the mere presence of simple human features, complete objects are regarded as anthropomorphized. This little alteration significantly affects the interaction between consumer and product. At the point when a product is anthropomorphized, consumers are able to enter a relationship with this kind of “human being” (Chandler & Schwarz, 2010). This in turn changes the experience consumers obtain with their possessions. It is known for example that when interacting with products with these anthropomorphic cues, consumers experience more positive effect (Wang, Baker, Wagner & Wakefield, 2007). This sort of attachment further enables consumers to form their relationships with and even depend on products.

Naturally, this whole concept was likely to attract players from the economic sector and to be investigated for profitable uses. Zipcar for example (a major car rental company) decided to give all of its rental cars different names so that consumers feel more attached and loyal to them (Levine, 2009). This strategy led the renters to be more conscientious while cleaning or maintaining the vehicles and saved the company a significant amount of money.

On the basis of these findings the first hypotheses of this study is formed. As Hadi and Valenzuela (2014) stated in their paper, it is proposed that the presence of human-like features on products plays an important part when people are performing meaningful gestures with them. It is hypothesized that when objects are regarded to be human at least in some way, hugging them will result in better product evaluations. This includes constructs like purchase intention, emotional attachment and product attitude. Therefore, the first hypothesis is stated as follows:

H1. When executing positive meaningful gestures towards objects, higher levels of emotional attachment, purchase intention and product attitude will be measured for objects that hold anthropomorphic traits compared to those who do not.

The three constructs involved in this hypothesis all have a major influence in the product experience and were deliberately selected. For once, purchase intention is defined as the actual probability that consumers will purchase a certain product (Sam, Fayli & Tahir, 2009). On the other hand, the concept of product attitude concerns itself with the consumers’ view of an object, how they feel about its appearance and whether they like it or not. Yet contrary to what some people might think it is stated that the willingness to purchase a product and the conscious opinion one has about an object alone, fail to represent the complete product experience. Therefore, it also needs to be considered in which way consumers are getting attached to the anthropomorphized item as an increased attachment to a purchased good leads people to treat their products differently (Schifferstein & Zwartkruis-Pelgrim, 2008). Schifferstein and Zwartkruis-Pelgrim state that an emotionally attached person is more likely to

handle the product with care, repair it or postpone its replacement as long as possible. This kind of behavior is favorable because it leads to a lower product turnover, which results in less waste, uses less resources and is more sustainable (Schifferstein & Zwartkruis-Pelgrim, 2008). This idea is supported by other literature which established that it is worth attempting to lengthen the psychological runtime of durable consumer products (Cooper, 2000; van Hinte, 1997).

It needs to be clarified though that emotional attachment is originally formed on an interpersonal level and one needs to be cautious when relating it to objects. For example, literature has found that individuals who have a strong attachment to a person are more likely to be committed to that person or even invest in or make sacrifices for that someone (Bowlby, 1980; Hazan & Shaver, 1994). In turn, this means that the emotional attachment of consumers to a brand might predict their brand commitment or willingness to make financial sacrifices for that brand in the same way (Thomson, MacInnis & Whan Park, 2005).

It is already known that people are able to form emotional attachments with a broad spectrum of entities, such as pets (Hirschman, 1994; Sable, 1995), places (Rubinstein & Parmelee, 1992) or even celebrities (Adams-Price & Greene, 1990; Alperstein, 1991). Nevertheless, the question remained how exactly people create these kinds of attachments. Answer to this was given by Schultz, Kleine & Kernan (1989), who came to the conclusion that emotional attachment generally results out of a felt connection or a sense of shared history with the product. Furthermore, Thomson et al. (2005) found that dynamic long-term relationships between consumers and products are often preconditions out of which attachment arises.

2.3 Differences between the sexes

When it comes to the topic of differences between men and women in evaluating product experiences though, it stands out that not much is known in recent literature about this question. In most cases, only evidence about gender differences in touching products can be found. Citrin, et al. (2003) for example stated that when making product evaluations, overall women showed a higher need for tactile information compared to men. This finding is in line with the article of Korgaonkar and Wolin (1999), who wrote that men are more likely to engage in online shopping than women although they are both equally likely to use the internet for personal and business purposes. Slyke, Comunale and Belanger (2002) support this notion as they note that “women may be visiting Internet sites, but men are more likely to purchase from these sites”.

But what innate characteristics define the different sexes when it comes to building a relationship with an actual object? There is evidence that, because they have experienced different sociocultural pressures, men are regarded as independent whereas women are regarded as interdependent (Cross & Madson, 1997). This finding might be related to the idea that most of the time, women are raised by adults of the same sex (mothers), which prevents them from experiencing separateness in relation to others (Citrin et al., 2003). On the other hand, they report that men need to

differentiate themselves from their mothers so that they can develop their own masculine sexual identities although this means that they will repress affective and relational issues. There are scientific indications that these dissimilar self-schemas of relatedness might not only influence thinking about the self but also about all objects, events and situations (Kernberg, 1976; Markus & Oyserman, 1989). Based on these findings one might draw the conclusion that these entities with different self-schemas also respond differently when performing meaningful affectionate gestures with anthropomorphized objects. It is expected that, because of these dependent and interdependent self-schemas, women might respond more sensible to the affectionate performance and show overall higher product evaluations. That is why the second hypotheses is formulated in the following way:

H2. When executing positive meaningful gestures towards anthropomorphized objects, women will report higher levels of emotional attachment, purchase intention and product attitude compared to men.

Last but not least, to offer some insights about how different gendered features of anthropomorphized objects are perceived, the study by Eyssel, Kuchenbrandt, Bobinger, Ruiter and Hegel (2012) will be presented. In their research design, participants were presented with a neutral-looking robot that was uttering sentences with either a male human voice or a female human voice. It turned out that when listening to a same-gender robot, the robot was perceived more positively, induced higher feelings of psychological closeness and anthropomorphism. As this is a relatively new topic in the field of science, these findings are applied in the third hypothesis, which holds the idea that an affectionate performance with objects with human-like features of the same gender as the consumer will result in better product evaluations:

H3. When executing positive meaningful gestures towards anthropomorphized objects with traits of the same gender as the participant, higher levels of emotional attachment, purchase intention and product attitude will be measured compared to objects with human features of the opposite gender.

2.4 Feelings of Loneliness

As it is established that target-specific features like anthropomorphic traits can influence the evaluative outcomes of the proposed interaction, one needs to take into account that individual-level factors can do so as well. When thinking about personal properties that might play a role in the process of an affectionate inter-personal gesture, the concept of loneliness comes to mind. The conclusion seems likely that someone who reports higher feelings of loneliness would also be more affected by the reassuring motion of a hug or other comforting gestures.

This idea is based upon the fact that people are likely to attach to objects in an attempt to compensate for their own interpersonal shortcomings (Eplay, Akalis, Waytz & Cacioppo, 2008; Lastovicka & Sirianni, 2011). On top of that, Eplay et al. (2008) found that loneliness and desire for social contact, amongst other individual difference variables, were linked to a higher tendency to anthropomorphize objects. There are some limitations though concerning these findings. Claus and Warlop (2010) for example have found that unexpected successful interactions with objects were needed to improve people's product performance expectations. The moderating effect of loneliness has been investigated as well in one of the three studies by Hadi and Valenzuela (2014). They report that feelings of loneliness are able to moderate the effects of meaningful gestures with anthropomorphized objects, but it is of utmost importance that these product interactions represent positive exchanges. Their study offers evidence that individual level factors in general may also function as moderating conditions for the manifestation of an embodied affection effect. This insight, that loneliness might moderate the effects of motion and anthropomorphic traits in the way that lonely people will show more positive product evaluations after hugging an object, is adapted in the fourth hypothesis:

H4. Personal feelings of loneliness will moderate the proposed effect indicated in H1, in that way that individuals who feel lonelier than others will be more affected as they will report higher values of emotional attachment, purchase intention and product attitude.

2.5 Need for Touch

All different kinds of concepts have been discussed so far that play a role in the setup of this study. However, the underlying sensational stimulation of touching objects itself has not been addressed yet. Every day people come in contact with the things that surround them. Most of the products that are in our possession even require a certain amount of involvement and participation. Yet, little is known about the effects on the customer-product relationship when people interact with their belongings. Early research laid the groundwork for further investigation as it was found that, when consumers were asked to evaluate a retailers' product offering, in the majority of cases information obtained through tactile input was weighted more significant than other (Holbrook, 1983). In more recent times, literature has proven that physical interactions with products influence people's attitudes towards them (Peck & Shu, 2009; McCabe and Nowlis, 2003). Peck and Shu even stated that the mere touch of an object is able to increase the perceived ownership of the product. They were so compelled by the topic that they even cited a famous quote of the movie 'Star Trek: First Contact' to emphasize the importance of touch:

Captain Jean-Luc Picard: It's a boyhood fantasy... I must have seen this ship hundreds of times in the Smithsonian but I was never able to touch it.

Lieutenant Commander Data: Sir, does tactile contact alter your perception?

Captain Jean-Luc Picard: Oh Yes! For humans, touch can connect you to an object in a very personal way.

From a more practical point of view, McCabe and Nowlis (2003) have found that when analyzing perceptual mechanisms that are at work in the sensation of touch, products with primarily martial properties (e.g. clothing) will be more preferred in shopping areas that enable haptic experiences with goods compared to areas that do not. It seems logical that these properties, that primarily include the surface and material of products, play an important role when consumers are able to gain their own experience of how these products feel. This difference in preference however could not be observed when using products with primarily geometric characteristics (like their shape), because they are mainly experienced by visual input.

Furthermore, literature states that there are certain categories of products that encourage haptic interaction more than others (Grohmann, Spangenberg & Sprott, 2007) and that the availability of tactile information influences customers' confidence in their evaluations about offered products (Peck and Childers, 2003a). Peck and Childers were also responsible for setting up the 'Need for Touch' scale, a measurement scale determining a persons need to obtain tactile information about products before purchases or when walking through stores (2003b). Because the scale was composed of statements from the autotelic domain and the instrumental domain, they were able to differentiate peoples innate need for touch. The autotelic dimension thereby refers to the enjoyment or stimulation one perceives by the mere sensation of touch itself, whereas the instrumental dimension refers to a rather outcome- or goal-directed tangent performance (typically before purchases).

In this study the personal inert 'Need for Touch' is also included as a possible moderator. The fifth and final hypotheses states that peoples' felt necessity to touch objects will affect how they evaluate their performed motion with them. We argue that not only people who experience higher levels of loneliness, but also people who have a higher desire to touch their surrounding objects, will indicate increased levels of the dependent variables. We expect an interfering effect of this personal need, because people will experience higher satisfaction when they are allowed to release their internal need and come in contact with the presented object.

H5. The personal 'Need for Touch' will moderate the proposed effect indicated in H1, in that way that individuals who feel a stronger urge to touch objects will be more affected as they will report higher values of emotional attachment, purchase intention and product attitude.

Last but not least, it needs to be clarified though what makes the haptic product experience so special compared to the stimulation of other senses. Citrin, Stern, Spangenberg and Clark (2003) state that: “Research on the importance of tactile information to obtain object information indicates that the tactile system maintains its own specialized pathways for encoding objects and that the representation of an object encoded through touch alone is substantially different from the representation of an object encoded based on a visual image”. This encoding pathway, known for touch sensation, is primarily involved in the encoding of the products substance or material in contrast to its shape where visual pathways play an equally important role (Klatzky et al., 1987; Ledermann et al., 1986).

2.6 Proposed research model

Putting the previously listed concepts together, a research model has been created that can be seen in figure 2.1. This stands in contrast to Hadi and Valenzuela (2014) who have created a theoretical framework that merely focusses on the statement that: “... only gestures that embody positive meaning and are congruent with the stimuli will lead to enhanced product attitudes and purchase intentions.” They emphasize that the consumer’s ‘individual-level of loneliness’ may moderate the ongoing effect as lonely people have a higher need to attach themselves through the assistance of successful social interactions.

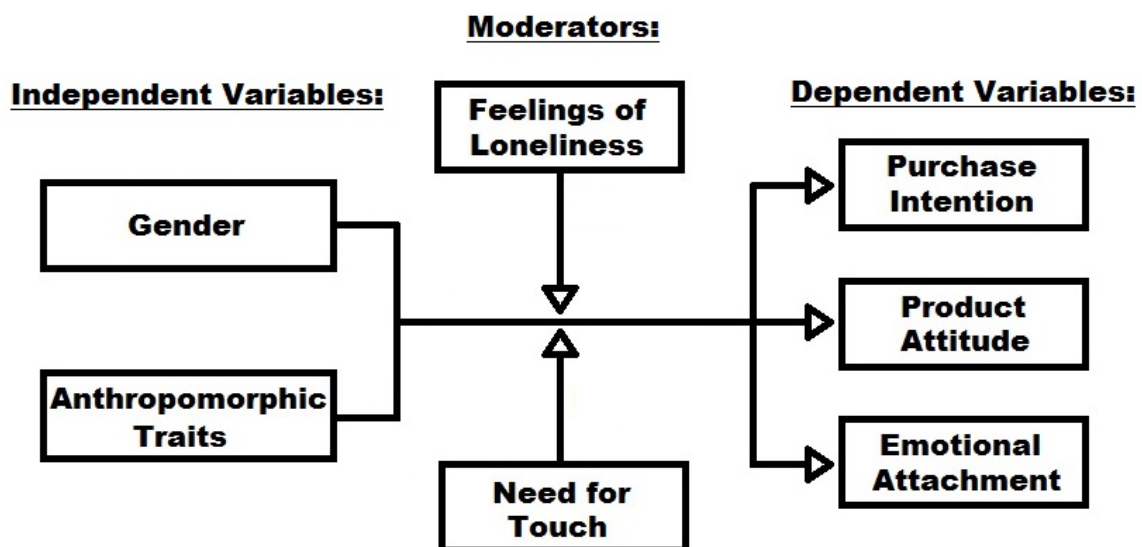


Figure 2.1: Proposed research model

For this study, their proposed model was revised as participant’s gender and anthropomorphic traits were implemented as independent variables. On top of that, the concept of ‘Need for touch’ is introduced as a possible second moderator. The dependent variables have been altered as well as emotional attachment has been added to the pool of constructs concerning product evaluations.

3. Method

Keeping the previously stated literature review and hypotheses in mind, this research aims to investigate the elaborated research model of Hadi and Valenzuela (2014) and find out more about the effects of meaningful gestures with anthropomorphized objects. For this reason an online pre-test to validate the stimuli and an experiment with a 2 x 3 between-subject design were set up. Furthermore, to enable a specific and qualitative measurement of the variables, a number of items and scales that have been proven to be useful in prior research studies were applied.

3.1 Pre-test

To get started, a pre-test was composed to gather complementary information about the stimuli. Like Hadi and Valenzuela in their third study, it was chosen to anthropomorphize typical clocks through the use of comic eyes. As it can be seen in figure 3.1 though, it was attempted to create two differently gendered clocks next to a neutral one. It can be seen that the eyes of the “male” clock were completed by ordinary hard-drawn eyebrows, whereas the eyes of the “female” clock were rounded out by sensual eyelashes.

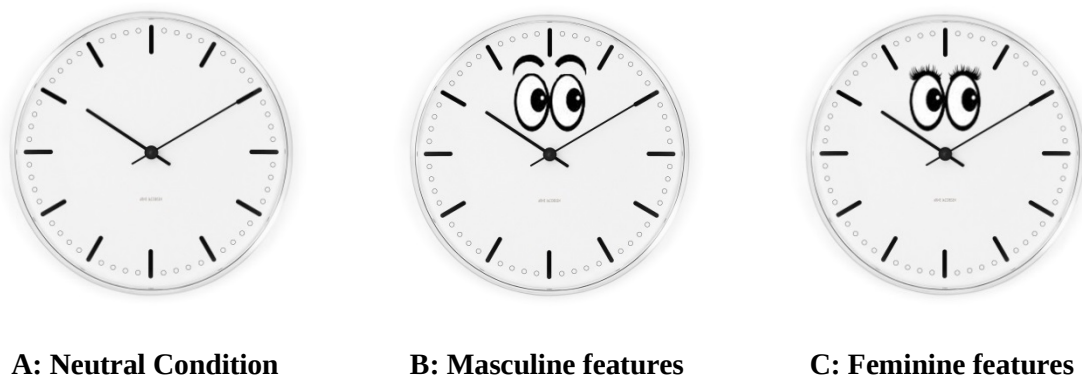


Figure 3.1: Original pre-test stimulus material

The participants of the pre-test took part via an online questionnaire, in which they were first asked about their general demographic characteristics (like nationality, gender, age). Subsequently they were presented with an image of each of the three clocks and were directly asked to answer the same couple of questions about every clock.

These questions and items were retrieved from different scales and focused around the participants' opinion and the appearance of the clocks. First of all, product attitude was constructed through the use of two Likert-Scale items derived from Hadi and Valenzuela (2014): “I like this product” and “this product is a good fit for my personal needs and preferences”. Furthermore, the respondents had to mark their product attitude on three bipolar items: “Please indicate to what extent the following characteristics describe the shown product: “Poor Quality (1) / High Quality (7)”,

“Interesting (1) / Boring (7)” and “Unpleasant (1) / Pleasant (7)” (adapted from Shimp, Stuart & Engle, 1991). These have been complement by three more items so that additional information about product attitude and the perceived gender of the clock could be obtained: “Masculine (1) / Feminine (7)”, “Attractive (1) / Unattractive (7)” and “Friendly (1) / Unfriendly (7)”. It needs to be stated that three items (‘Attractive’, ‘Friendly’ and ‘Interesting’) were phrased from positive to negative to prevent a possible response bias and therefore needed to be recoded after the data collection.

Consecutively, the construct of emotional attachment was measured via a 9-item scale (adapted from Thomson et al., 2005): “Ranged from one (not at all) to ten (perfectly), how do the following adjectives describe your feelings about the product?”: “Affectionate”, “Connected”, “Friendly”, “Loved”, “Peaceful”, “Passionate”, “Delighted”, “Captivated” and “Bonded”. Last but not least, to investigate the accurate level of anthropomorphism, a scale with 5 questions has been worked out based on the study by Waytz, Cacioppo and Epley (2010). Participants had to indicate, with a number ranged from one to ten to what extent the product: “has free will”, “experiences emotion”, “has a mind of its own”, “has consciousness” and “has intentions”. This in turn led to a pre-test with a total of 69 items.

Social media was used to gather 14 German acquaintances as informants over the course of two weeks. They were aged between 21 and 27 years ($M = 24.07$, $SD = 1.54$) and consisted of 8 males (57,1%) and 6 females (42,9%). When reviewing the obtained data from these participants with assistance of ‘IBM SPSS Statistics 22’, it was found that the nine items from the emotional attachment scale had in each condition a very good reliability (NC: $\alpha = .90$, MC: $\alpha = .92$, FC: $\alpha = .93$). The same goes for the five items from the anthropomorphism scale, which scored a good alpha in every condition as well (NC: $\alpha = .81$, MC: $\alpha = .92$, FC: $\alpha = .91$). The important thing to note though is that, as it can be seen in table 3.1, data indicates that the masculine clock was not perceived as such. A paired-samples t-test was conducted to compare the level of perceived gender in the neutral condition (NC) and the masculine condition (MC). It was found that there was not a significant difference in the scores for NC ($M = 3.14$, $SD = 1.29$) and MC ($M = 3.29$, $SD = 1.38$); $t(13) = -0.22$, $p = 0.83$. On the other hand, the same type of analysis done with the scores of anthropomorphism showed that there was a significant difference between NC / MC ($t(13) = -3.54$, $p = 0.004$) and NC / FC ($t(13) = -3.27$, $p = 0.006$).

Table 3.1: Means (standard deviations) of Pre-test conditions

	Neutral Clock (NC)	Male Clock (MC)	Female Clock (FC)
Gender	3.14 (1.29)	3.29 (1.38)	6.43 (.51)
Anthropomorphism	2.06 (1.53)	3.86 (2.49)	3.96 (2.51)

These findings hold that the male and female clock have better chances to be noticed as human-like and that the use of comic features seems to be successful. However, because the different clocks currently fail to represent the opposing sexes in a sufficient manner, it was chosen to complement the anthropomorphic features of MC and FC. Figure 3.2 shows the new stimulus material that was used in the further process of this study. A mustache was added to the male clock and a pair of red sensual lips to the female clock in order to clarify the different gender roles.

To see if this was a step in the right direction, again 5 participants (3 men and 2 women) were approached with the new stimuli and the 69-items containing pre-test. The results delivered supporting signs, as the gender of the different clocks was better noticed. Respondents reported distinguishable levels of perceived gender for NC ($M = 3.00$, $SD = .71$), MC ($M = 1.80$, $SD = .84$) and FC ($M = 6.40$, $SD = .55$).

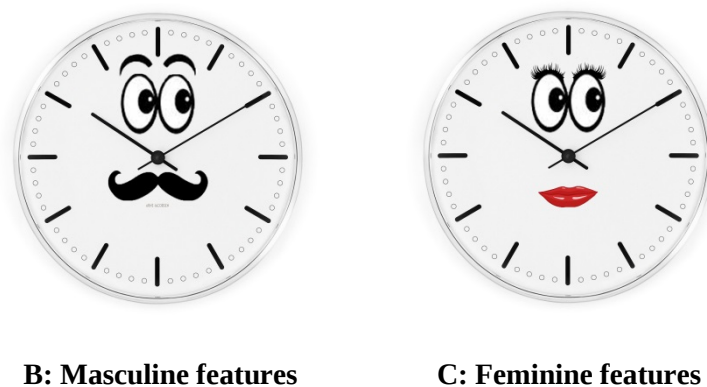


Figure 3.2: Adapted pre-test stimulus material

3.2 Main study

After the pre-test had been carried out, the planning of the main study's experiment began. As mentioned earlier, a 2 (gender: male vs. female) x 3 (anthropomorphic traits: absent vs. masculine vs. feminine) between-subject design was implemented. Like in the pre-test, the anthropomorphic traits had been manipulated through the use of comic characteristics. In every one of the six conditions the same clock with a simplistic design had been used to minimize potential confounds. Keeping the external validity in mind, it needs to be added that it was an real existing clock that can be bought and placed on a wall just like any other. The anthropomorphic features in turn were placed with transparent adhesive tape on the front side of the clock.

3.2.1 Procedure

The experiment was set up during four weeks between November – December 2014 in a research facility of the behavioral science department of the University of Twente (Netherlands). The willing respondents were placed in an isolated room in front of an informational brochure next to the corresponding clock and were all given the same instructions. Before starting with the experiment it

was clarified that the study could be stopped at any time and that one should not hesitate to question the researcher if something should be unclear for the participant.

To create a natural testing environment, a believable cover up story was prepared like in the study of Hadi and Valenzuela (2014). The participants were informed that, “because consumers often have to carry products between different locations, product manufacturers wish to know how consumers feel when carrying products”. Therefore it would be necessary for the participants to transport the clock lying in front of them through the building to a designation point by using a hugging gesture that was indicated by a picture (see figure 3.3).



Figure 3.3: Cue for hugging gesture

It was further commented that the subjects should first get familiarized with the clock and form a good understanding of all of its features. Additionally, the information was given to all participants that only the hugging motion should be used during the transport and that any interference should be ignored. The specific destination on the other hand was illustrated by a map of the floor plan (see Appendix 1) with corresponding notes. After completing the tour and returning back to the research chamber, which usually took about five minutes, the subjects were allowed to proceed with the study by filling out the presented 42-item questionnaire. Once the form was complete, the respondents received a debriefing and were thanked for their participation.

3.2.2 Participants

Reviewing the sample size, a total of 147 respondents have devoted their time to take part in this study. Out of these, two data sets have been deleted due to incomplete entries, resulting in a sample of 145 subjects that was used for further analysis. The respondents were gathered by approaching students (on campus and via social media) and through the assistance of SONA-systems (a method

used by the University of Twente that requires first and second year students to take part in a number of experiments in exchange for credits).

The age of the participants' (N = 145) varied between 17 and 36 with an average score of 22.52 (SD = 3.29). 82 women (56.6%) took part in the study compared to 63 men (43.4%). In addition, the majority of people were German (71%), followed by Dutch (26.9%) and other (2.1%). Regarding the students status of enrolment, it can be said that 74.5% of the respondents were enrolled in a Bachelor program, 20% in a Master program and 5.5% were not enrolled in a facility of higher education while participating in this study. The most common fields of study in turn were 'psychology' (66.2%), 'communication science' (12.4%) and 'international business and administration' (9%). For further information, table 3.2 offers an overview of the participants' descriptive statistics and the proportion of men and women in the conditions.

Table 3.2: *Participants' descriptive statistics*

Respondents (N = 145)		M	SD	N	%
Gender	Male			63	43.4
	Female			82	56.6
	Total			145	100
Age		22.52	3.29		
Nationality	German			103	71
	Dutch			39	26.9
	Other			3	2.1
Program	Bachelor			108	74.5
	Master			29	20
	None			8	5.5
Field of Study	Psychology			96	66.2
	Communication Science			18	12.4
	IBA			13	9
	Other			18	12.4
				N men (%)	N women (%)
Condition	Neutral Condition			19 (13.1)	33 (22.8)
	Masculine Condition			25 (17.2)	24 (16.6)
	Feminine Condition			19 (13.1)	25 (17.2)

3.2.3 Scales

The applied questionnaire can be compared to the list of items from the previously executed pre-test. First of all, again general demographic statistics about the participants were gathered that also included questions about the field of study and whether the participant was enrolled in a bachelor or master program. These were followed by the two 7-point Likert-scale items derived from Hadi and Valenzuela (2014) that had been used in the pre-test to assess product attitude. Additionally, three Likert-scale items about purchase intention and one cover up item about carrying the clock were appended: “I am willing to buy this clock in the future”, “I would buy this clock”, “I would buy this clock, if I needed a new clock” and “This clock was easy to carry”. Participants had to indicate how much they are in line with the presented statements on a scale ranged from one (strongly disagree) to seven (strongly agree). In the next section of the form, the bipolar items from the pre-test were implemented as well, followed by the same questions about emotional attachment and perceived level anthropomorphism.

To round up the list of questions, two sets of items have been applied to investigate the proposed possible moderating effects of feelings of loneliness and ‘Need for Touch’. To measure the participants individual level of loneliness a three item scale devised by Hughes, Waite, Hawkley and Cacioppo (2004) had been used. This scale contained questions concerning the respondent’s feelings about his social surroundings, which had to be answered by how often they were noticed (Hardly ever, some of the time, often): “How often do you feel that you lack companionship”, “How often do you feel left out” and “How often do you feel isolated from others”. Having said that, the concept of ‘Need for Touch’ was measured through the use of eight Likert-scale statements that have been inferred from the original twelve item NFT-Scale by Peck and Childers (2003b). Attention was laid on equally selecting four items each regarding the instrumental and autotelic factor. These factors concern whether someone is performing a goal-driven touching motion to achieve additional information prior to a purchase or whether this person merely performs this motion for its own sake and feels pleasure while doing so.

3.2.4 Reliability analysis

The internal consistency of the applied scales was investigated through the use of a reliability analysis. According to Pallant (2005) a score of Cronbach’s alpha above 0.7 is considered to be satisfying and a score above 0.8 to be good. Therefore, when looking at table 3.3, one can conclude that the constructs of anthropomorphism and ‘Need for Touch’ have a good internal consistency. The reliability of feelings of loneliness can be considered to be satisfying. On top of that, because the constructs of purchase intention and emotional attachment scored an alpha above .9, their reliability can even be viewed as very good.

Table 3.3: *Reliability of used constructs*

Constructs	Cronbach's alpha	N (amount of items)
Purchase intention	.90	3
Emotional attachment	.93	9
Anthropomorphism	.89	5
Feelings of loneliness	.76	3
Need for Touch	.87	8
Product attitude (original)	.52	5
Product attitude (adapted)	.66	5

On the other hand, the originally proposed scale of product attitude by Hadi and Valenzuela in (2014) failed to achieve a satisfying Cronbach's alpha. The single parts of this five item scale, that were already used in the pre-test, seem to vary too much to measure the same construct and be grouped together. However, a combination of items (asking to what degree the clock is perceived as 'Likeable', 'Attractive', 'Friendly', 'Interesting' and 'Pleasant') was found that resulted in an acceptable alpha of .66 and that was used to build the new elaborated construct of product attitude. For a detailed descriptive statistics overview of every item used in the composed scales see appendix B.

In addition, the selection of items for the modified product attitude scale can be supported by factor analysis. Evidence for underlying components was initially indicated by the Kaiser-Meyer-Olkin measure of sampling adequacy with a score of .69 (which is above the acceptable limit of .50). Bartlett's test of sphericity on top of that reported that correlations among items were sufficiently enough for further analysis ($\chi^2(21) = 121.63$, $p < .001$). A principle component analysis (rotation method: Oblimin with Kaiser normalization) with all seven product attitude related items revealed 2 factors with a greater eigenvalue than one ($F1 = 2.22$ and $F2 = 1.38$), that cumulatively explain 51.35% of the variance. When further reviewing the output, it can be seen in the pattern matrix (table 3.4) that exactly the five selected items have a good correlation with the first component (greater than .3). In contrast, only three items were able to score a good correlation with the second component. Therefore, it can be assured that the composed scale is the best option for measuring the respondents' product attitude.

Table 3.4: *Pattern matrix of item correlations with components*

Item	Component 1	Component 2
Pleasantness	.741	.063
Friendliness	.711	-.319
Interesting	.643	-.058
Attractiveness	.588	.233
Quality	-.160	.739
Personal Fit	.080	.725
Likeable	.486	.509

4. Results

First of all when reviewing the compiled data, one needs to take a look into the perception of the clocks gender before making any further assumptions. Just as the pre-test indicated, an one-way between subjects analysis of variance (ANOVA) revealed that there is a significant effect of the three conditions on perceived gender ($F(2, 142) = 70.67, p < .01$). To be more specific, different means were obtained for the masculine clock ($M = 2.63, SD = 1.50$), the neutral clock ($M = 3.96, SD = 1.22$) and the female clock ($M = 5.86, SD = 1.19$). In the upcoming parts, the analysis of the dependent variables (purchase intention, product attitude and emotional attachment) will be addressed first, followed by the moderators (feelings of loneliness and ‘Need for Touch’).

4.1 Purchase intention

In order to investigate the construct of purchase intention, a 2 (gender: male vs. female) x 3 (features: absent vs. masculine vs. feminine) analysis of variance (ANOVA) was conducted. Results revealed a significant main effect for the clocks features ($F(2, 139) = 9.24, p < .00$) but no significant main effect for participants’ gender ($F(1, 139) = 1.09, p = .30$) on purchase intention. In addition, no interaction effect was found for gender x features ($F(2, 139) = .17, p = .85$). Table 4.1 summarizes the means and standard deviations for every condition.

Table 4.1: *Means (and standard deviations) of purchase intention per condition*

Features	Male	Female	Total
Absent	4.18 (1.26)	3.81 (1.30)	3.94 (1.29)
Masculine	2.92 (1.20)	2.86 (1.31)	2.89 (1.24)
Feminine	3.18 (1.74)	2.89 (1.40)	3.01 (1.55)
Total	3.38 (1.48)	3.25 (1.39)	3.30 (1.43)

Post-hoc comparisons using the Bonferroni test indicated that the mean score for the neutral condition ($M = 3.94$, $SD = 1.29$) was significantly higher than the masculine condition ($M = 2.89$, $SD = 1.24$) and the feminine condition ($M = 3.01$, $SD = 1.55$) at $p < .05$. However, the masculine condition did not significantly differ from the feminine condition. It is visible that when features are present, men as well as women are less willing to buy the presented clock. This surprising occurrence holds that hypothesis 1 is not supported regarding purchase intention. The same goes for hypothesis 2 because no main effect for participants' gender could be found. Concerning hypothesis 3 about same gender traits, it can be stated that again using post-hoc comparisons with Bonferroni, no significant differences were found for the means of a) males using the masculine clock and females using the masculine clock ($p = 1$) or b) males using the feminine clock and females using the feminine clock ($p = 1$).

4.2 Product attitude

The following dependent variable was aimed at measuring whether or not the participants have a favorable attitude towards the clock or not. As stated earlier, the construct of product attitude consisted of one Likert-Scale item ('Likeable') and four bipolar items ('Attractive', 'Friendly', 'Interesting' and 'Pleasant'). Again a 2 x 3 two-way ANOVA was carried out in order to gain an understanding of the ongoing effects. Although the respondents' sex failed to achieve a significant main effect ($F(1, 136) = .00$, $p = .98$), the presence of anthropomorphic traits had a significant effect on the participants' product evaluations ($F(2, 136) = 5.78$, $p < .05$). On top of that as predicted, the interaction of both fixed factors was also significant ($F(2, 136) = 3.18$, $p < .05$). To enable a better understanding of this effect, the findings are displayed by figure 4.1.

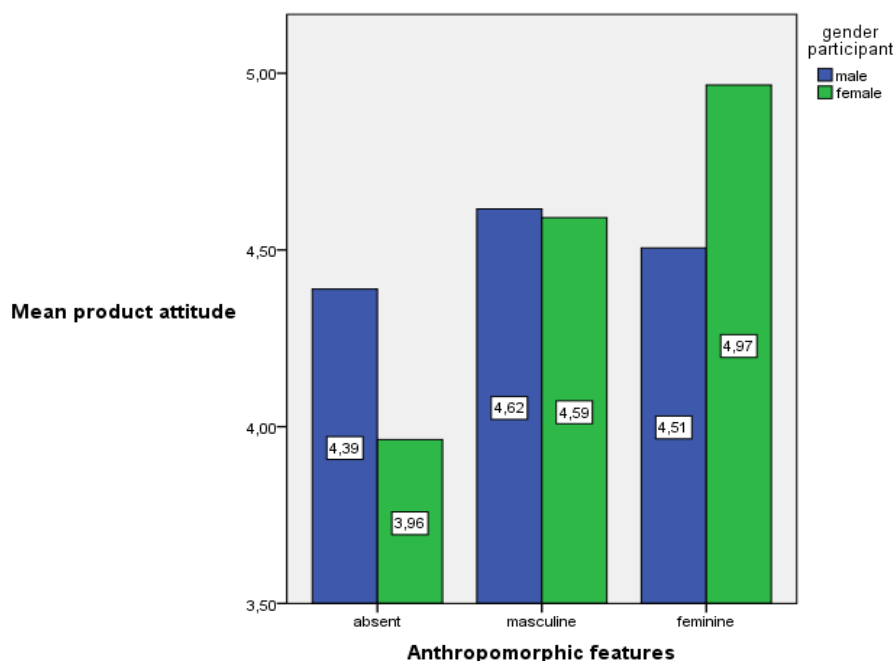


Figure 4.1: Means of product attitude per condition

It can be observed that women score low on product attitude when no features, mediocre when masculine features and high when female features are present. On the other hand, male participants report in every condition relatively the same levels of product attitude compared to their female counterparts.

Because no significant main effect for participants' gender could be found, evidence suggest that women do not score generally higher than men in terms of product attitude. That is why hypothesis 2 is not supported by this data. Addressing the first and third hypothesis, Post-hoc comparisons using the Bonferroni test indicated that the mean score for the neutral condition ($M = 4.12$, $SD = .78$) was significantly lower than the masculine condition ($M = 4.60$, $SD = .80$, $p = .01$) and the feminine condition ($M = 4.78$, $SD = .92$, $p < .01$). No significant difference could be found between the masculine and feminine condition. Based upon this, hypothesis 1, that states that anthropomorphized objects yield higher levels of product attitude than objects with no features, can be confirmed. It should also be stated that a significant evidence was found that women score in the feminine condition ($M = 4.97$, $SD = .87$) higher than in the neutral condition ($M = 3.96$, $SD = .80$) and that the same effect could not be found for male respondents. Nevertheless, hypothesis 3, investigating the beneficial effects of same gender traits, cannot be confirmed in terms of product attitude. This comes through the fact that post-hoc comparisons using Bonferroni did not sufficiently indicate significant differences between men and women using the masculine ($p = 1$) or the female clock ($p = 1$).

4.3 Emotional attachment

Last but not least, a third two-way ANOVA was executed for reviewing the final dependent variable of how emotional attached people are to the utilized clock. It did not come as a surprise that another significant main effect for anthropomorphic traits was found ($F(2, 139) = 3.50$, $p < .03$). Yet, gender as an independent variable failed again in obtaining a significant effect ($F(1, 139) = 2.83$, $p = .10$) as well as the interaction between gender and features ($F(2, 139) = .19$, $p = .83$). The means and standard variations of emotional attachment can be found in table 4.2. These results clearly show that, both men and women have the strongest emotional attachment to the feminine clock, followed by the masculine clock. As proposed, the clock without any anthropomorphic features achieved the lowest levels of emotional attachment.

Table 4.2: *Means (and standard deviations) of emotional attachment per condition*

Features	Male	Female	Total
Absent	3.82 (1.87)	4.20 (1.76)	4.26 (1.80)
Masculine	4.20 (1.66)	4.95 (1.50)	4.57 (1.61)
Feminine	4.79 (1.76)	5.16 (1.97)	5.00 (1.87)
Total	4.26 (1.77)	4.71 (1.80)	4.52 (1.79)

The conclusions can be drawn that, because of the missing main effect for participants gender, hypothesis 2 is also dismissed for emotional attachment as dependent variable. On the other hand, post-hoc comparison with Bonferroni revealed that the mean of the feminine condition ($M = 5.00$, $SD = 1.87$) was higher than the mean for the neutral condition ($M = 4.26$, $SD = 1.80$) with a significance level of $p = .03$. This issue proves that H1, stating that objects with human features will lead to improved product evaluations compared to objects without features, can be confirmed in terms of emotional attachment. Last but not least, again no evidence could be found by post-hoc comparisons using Bonferroni that participants with the same gender as the presented traits would score higher than participants of the other gender. As analysis revealed a significance level of $p = 1$ for the differences in participants' mean score in the masculine as well as in the feminine condition, hypothesis 3 is not supported in terms of emotional attachment.

4.4 Feelings of loneliness

To address the moderating role of feelings of loneliness, a one-way analysis of covariance (ANCOVA) was used to compare the scores of purchase intention, product attitude and emotional attachment for the different conditions. Feelings of loneliness was therefore included as a covariate to partial out the effects of participants' loneliness levels from the analysis.

Examination of the Shapiro-Wilk statistics and histograms for each condition revealed that the ANCOVA assumption of normality was violated by the dependent variables. Generally, ANCOVA is considered to be robust against small to moderate violations of the normality assumption, provided that the scores for the covariate alone are normally distributed (Allen & Bennett, 2012). Yet, the assumption of normality was violated as well for the scores of both moderators as it can be seen in table 4.3.

Table 4.3: *Shapiro-Wilk test for normal distribution*

Construct	Condition	Statistic	df	Sig.
Purchase Intention (PI)	Neutral	.978	52	.435
	Masculine	.943	49	.020
	Feminine	.922	41	.008
Product attitude (PA)	Neutral	.977	52	.413
	Masculine	.957	49	.072
	Feminine	.946	41	.050
Emotional Attachment (EA)	Neutral	.953	52	.041
	Masculine	.908	49	.001
	Feminine	.966	41	.245
Feelings of Loneliness (FOL)	Neutral	.859	52	.000
	Masculine	.863	49	.000
	Feminine	.862	44	.000
Need for Touch (NFT)	Neutral	.968	52	.172
	Masculine	.935	49	.010
	Feminine	.980	44	.648

Scatterplots indicated that the relationship between the covariate (feelings of loneliness) and all dependent variables was linear. Additionally, the assumption of homogeneity of regression slopes was supported by the absence of a significant IV-by-covariate interaction for purchase intention ($F(2, 139) = 1.92, p = .15$), product attitude ($F(2, 136) = 1.27, p = .28$) and emotional attachment ($F(2, 139) = .92, p = .40$). Finally, the homogeneity of variances was proven by non-significant Levene's tests for PI ($F(2, 142) = 1.79, p = .17$), PA ($F(2, 139) = 1.38, p = .25$) and EA ($F(2, 142) = .21, p = .81$).

The ANCOVA though indicated that, feelings of loneliness as a covariate is not related to any of the dependent variables (PI: $F(1, 141) = .52, p = .47$, partial $\eta^2 = .004$, PA: $F(1, 138) = .00, p = .98$, partial $\eta^2 = .000$ and EA: $F(1,141) = 1.24, p = .27$, partial $\eta^2 = .009$). Furthermore, the effect of the clock's gender on the dependent variables was in all three cases statistical significant (PI: $F(2, 141) = 8.95, p = .00$, partial $\eta^2 = .113$, PA: $F(2, 138) = 7.98, p < .01$, partial $\eta^2 = .104$ and EA: $F(2,141) = 3.48, p = .03$, partial $\eta^2 = .047$).

When taking a look into the Pearson product-moment correlation coefficient between the moderator and the three dependent variables, it becomes obvious that there is no real correlation with either 'PI' ($r = .064, n = 145, p = .44$), 'PA' ($r = -.006, n = 142, p = .95$) or 'EA' ($r = .087, n = 145, p = .30$). For a complete overview of all measured correlations between the used variables in this study, table 4.4 is presented. Concerning the moderation effect it needs to be stated that, even after conducting a median split, no supporting evidence of a moderating effect could be found. This means

that the construct of feelings of loneliness does not function as a moderator and that H4 is not confirmed.

Table 4.4: *Correlations between all used variables*

Measure	1	2	3	4	5	6
1. Purchase Intention	-					
2. Emotional Attachment	.23	-				
3. Product Attitude	.22	.47	-			
4. Anthropomorphism	.03	.30	.00	-		
5. Feelings of Loneliness	.06	.09	-.01	.11	-	
6. Need for Touch	.16	.29	-.01	.03	.04	-

4.5 Need for Touch

On the other hand, the same procedure was used to find out more about the moderating effect of the construct ‘Need for Touch’. The one-way analysis of covariance (ANCOVA) again compared the dependent variables’ scores for each condition. ‘Need for Touch’ was added as covariate to partial out possible effects from the analysis.

As already stated in table 4.3, reporting the Shapiro-Wilk statistics, this moderator too struggled with the problem that the dependent variables’ scores were not normally distributed in every condition. It can be seen that also the scores for NFT indicated a violation of the normality assumption in the masculine condition. Nonetheless, Scatterplots showed that the relationship between the covariate (‘Need for Touch’) and all dependent variables was linear. On top of that, the assumption of homogeneity of regression slopes was supported by the absence of a significant IV-by-covariate interaction for purchase intention ($F(2, 139) = .63, p = .53$), product attitude ($F(2, 136) = .14, p = .87$) and emotional attachment ($F(2, 139) = .17, p = .85$). In addition, as Levene’s test was not significant for PI ($F(2, 142) = 1.79, p = .17$), PA ($F(2, 139) = 1.40, p = .25$) and EA ($F(2, 142) = .50, p = .61$), the assumption of homogeneity of variances was not violated.

The output of the analysis showed that, ‘Need for Touch’ as a covariate is not related to the dependent variables of PI ($F(1, 141) = 2.69, p = .10$, partial $\eta^2 = .019$) or PA ($F(1, 138) = .02, p = .89$, partial $\eta^2 = .000$). Though it was found that NFT was significantly related to emotional attachment, $F(1,141) = 14.70, p = .00$, partial $\eta^2 = .094$). Furthermore, the effect of the clock’s gender on the dependent variables was again in all three cases statistical significant (PI: $F(2, 141) = 8.41, p = .00$, partial $\eta^2 = .107$, PA: $F(2, 138) = 7.99, p < .01$, partial $\eta^2 = .104$ and EA: $F(2,141) = 4.097, p = .02$, partial $\eta^2 = .055$). This finding holds that, after accounting for the effects of ‘Need for Touch’, there was a statistically significant effect of the clock’s gender on emotional attachment. Post-hoc testing revealed that the participants in the feminine condition reported higher levels of emotional attachment

than participants in the neutral condition, even after controlling for NFT. The remaining pairwise comparisons were not significant.

Concerning the moderation effect it needs to be stated that, supporting evidence of a moderating effect could be found for the concept of emotional attachment. When comparing the data with the original analysis of variance, it can be seen that when including NFT in the analysis, lower p-values were achieved for EA (from .035 to .019). The amount of variation accounted for by the model (SSM) has been improved to 63.03 units for EA (corrected model), which implies that the unexplained variance (SSR) has been reduced to 400.03 units. This means that the construct of feelings of loneliness does function as a moderator on emotional attachment and that H5 is confirmed.

Last but not least to offer some final interesting results, it occurred that there was a significant difference between men and women when reporting their innate 'Need for Touch' ($F(1, 139) = 21.88$, $p = .00$). Results thereby show that women ($M = 5.04$, $SD = 1.06$) generally have a higher need to touch objects than men ($M = 4.18$, $SD = 1.06$).

4.6 Anthropomorphism

Like in the pre-test, the perceived level of anthropomorphism was measured. An one-way ANOVA surprisingly revealed only a marginally effect this time for anthropomorphic traits ($F(2, 142) = 2.73$, $p = .07$) that failed to pass the significant level of .05. Post-hoc comparisons with the means and standard deviations for the three conditions (NC = 1.45 (.92), MC = 2.11 (1.79), FC = 1.73 (1.44)) were performed. They indicate that there is no significant difference between the neutral condition and the masculine condition ($p = .06$) or the feminine condition ($p = 1$). Also no significant difference was found between the two anthropomorphized conditions ($p = .61$). The results thereby show that the respondents do not actively think that the two clocks equipped with human features, actually have a consciousness or mind of their own.

5. Discussion

The purpose of this study was to gain new insights in the effects of meaningful gestures with anthropomorphized objects. In fact, the specific goal was to find out whether men and women respond differently when performing affectionate gestures with products that hold either masculine or feminine human features. It was formulated that new knowledge in this field will lead to a better understanding of human-product relationships and how products are perceived after an intentional motion has been performed with them. The direction of this study seems promising as people are more and more physically interacting with a variety of (technological) products on a daily basis. Therefore from a marketing communication perspective, new information is needed to use and benefit from this condition.

With the purpose of addressing this intention, five hypotheses have been composed and tested in the course of this research. On the one hand, it was aimed to replicate the study from Hadi and Valenzuela (2014) by proving that affectionate gestures with products result in improved product evaluations only when anthropomorphic traits are present (H1). Likewise it was stated that the participant's sex would also have a significant influence in the perception of products in the way that women would report higher levels of product evaluations than men (H2). On the other hand, it was reviewed whether the presentation of gendered human features would lead to increased levels of product evaluations when approached by a participant of the same gender compared to the opposite gender (H3). To round things up, the moderating role of feelings of loneliness was investigated (H4) and the individual 'Need for Touch' was introduced as a possible second moderator (H5). Together, these five hypotheses form an elaborated research model with a profound scientific value.

5.1 Discussion results

The conducted experiment of this study delivered a number of interesting results for further interpretation. Analysis of the two independent variables, three dependent variables and two moderators revealed supporting as well as disproving evidence for the introduced hypotheses. All in all, it can be declared that this study was able to bring new knowledge to the scientific world about how the concept of gender influences consumers' product evaluations.

First of all, it came as a surprise that the construct of purchase intention delivered opposing results unlike they were expected. They hold that the respondents are much more willing to buy the neutral clock without any human features compared to the other two conditions. This finding is not in line with the results of the study by Hadi and Valenzuela (2014) who found that the presence of anthropomorphic traits will lead to a higher purchase intention when meaningful gestures are performed with products.

As disappointing as this fact might seem, a possible explanation for this is given by the design of the clocks. The fact that the anthropomorphic features were attached with transparent adhesive tape onto the front of the clock might harm the perception of quality of the product (confirmed by data). Thereby, people might get the opinion that this is not an actual product that can be bought in an usual store. Although the features were placed with utmost care on the surface, it was still clearly visible that the clock had been altered and did not leave the production cycle in this state. A professional placement of the comic-style face features in the inside of the clock, without any visible indications of alteration like tape, might prove to be beneficial in resolving this occurrence and lead to the expected results. As this special occurrence referring to the concept of purchase intention has been explained, the confirmation status of the proposed hypotheses is going to be discussed next.

After reviewing the gained results by this study, conclusions about the verification of the hypotheses can be drawn. The results were able to confirm H1 that stated: "When executing positive

meaningful gestures towards objects, higher levels of emotional attachment, purchase intention and product attitude will be measured for objects that hold anthropomorphic traits compared to those who do not". The results for product attitude and emotional attachment support this as they clearly showed that the presence of anthropomorphic features had a positive effect. H2 on the other hand could not be confirmed as it was formulated as follows: "When executing positive meaningful gestures towards anthropomorphized objects, women will report higher levels of emotional attachment, purchase intention and product attitude compared to men". This comes through the fact that no significant difference between men and women was found for all the dependent variables. The same goes for H3, that could not be confirmed as it stated: "When executing positive meaningful gestures towards anthropomorphized objects with traits of the same gender as the participant, higher levels of emotional attachment, purchase intention and product attitude will be measured compared to objects with human features of the opposite gender". H4 that proposed: "Personal feelings of loneliness will moderate the proposed effect indicated in H1, in that way that individuals who feel more lonely than others will be more affected as they will report higher values of emotional attachment, purchase intention and product attitude" had to be dismissed because FOL was not significantly related to the dependent variables. In turn H5 saying that "The personal 'Need for Touch' will moderate the proposed effect indicated in H1, in that way that individuals who feel a stronger urge to touch objects will be more affected as they will report higher values of emotional attachment, purchase intention and product attitude" could be confirmed for the concept of emotional attachment. It was proven that, when including NFT in the analysis as a covariate, the amount of variation explained by the model was increased.

Taking a closer look into the results, it is noticeable that both adapted clocks achieve a higher product attitude than the neutral clock. It was shown that women seem to be exceptionally fond of the feminine clock and dislike the neutral clock. Yet, the same effect could not be found for their male counterparts. This means that it is proven that women respond differently to performing meaningful gestures with anthropomorphized products than men. When explicitly asked, men report that the fact, whether human features are present or not, does not have much of an influence on how they perceive the product. Women in turn seem to be more sensitive to the appearance of the clock and favor feminine over no features.

This interesting finding can be explained by the society's focus on female appearances. Starting at a young age, girls are confronted with typical stereotypes about beauty and attractive appearance and often are pressured in fulfilling related expectations. The media plays a big part in this, as it can be seen for example in the ongoing presentation of sex role stereotyping in television commercials aimed at children (Browne, 1998). Furthermore, Rita Jackaway Freedman already stated in 1984 that an attractive appearance is essential to the feminine gender role and that it is not uncommon that psychological problems go hand in hand when attempting to conform to this role. That

is why it is no surprise that especially women respond so delicate when asked about the physical appearance and their evaluations of the feminine clock.

When addressing the emotional attachment people obtained with the product during the experiment, results revealed that feminine anthropomorphic traits generally led to more attachment than no traits. Although women scored in every condition a higher mean of attachment, the difference to men was not significant. Nevertheless, it was proven that the feminine clock enabled a better foundation for an emotional connection than the neutral clock. It can be said that when using the neutral clock, people scored the lowest levels of attachment with the product. This outcome is also in line with Hadi and Valenzuela (2014), as they report that human-like features are needed in order to build a relationship between person and product.

Unfortunately, as much as the outcomes of the dependent variables offer possibilities for interpretation and implementation, the same cannot be said about the proposed moderator feelings of loneliness. The results have shown that no moderating effect on the dependent variables could be found for purchase intention, product attitude or emotional attachment and that the fourth hypotheses could not be supported. This phenomenon can be traced back to the fact that participants scored roughly the same mean for FOL in every trait and gender condition (about 1.51). It can be concluded that the used 'Three-Item Loneliness Scale' by Hughes et al. (2004) failed in obtaining differentiated and flexible scores and thereby had no additional value. For future researches it is advised to apply a more elaborated scale with more items like the 'UCLA Loneliness Scale' for example.

On the other hand, the outcome for the second moderator 'Need for Touch' was much more satisfying compared to the first moderator. The results have revealed that people who have a high innate desire to touch objects in their environment also report a higher emotional attachment to an anthropomorphized product with female features after they have performed a meaningful gesture with it. This finding holds that NFT plays an important role in the consumer-product interaction and should not be left out in upcoming attempts to further investigate the topic. On top of that, it was found that women scored generally higher on NFT than men. The fact that female participants feel a higher innate need to touch objects before purchases and for pleasure should be kept in mind for future research.

5.2 Conclusions

When reviewing the results of this study, one needs to draw the conclusion that, except for purchase intention, every dependent variable was improved in some way by the display of human features on the clock. Therefore, it can be stated that, when executing positive meaningful gestures towards anthropomorphized objects, people overall build a better product attitude and a stronger emotional relationship when feminine features are being used.

On the topic of gender, a number of interesting insights could be gained that bring new knowledge to the table of scientific understanding. It can be concluded that feminine anthropomorphic

traits achieve better product evaluations than their masculine counterparts at least in terms of emotional attachment. This means that people respond particularly well to the presence of female features when performing affectionate gestures with everyday products. This outcome is of great importance as it offers a number of practical implementations for the market economy.

Concerning the participants' gender on the other hand, women have proven to be very sensitive on the matter of product attitude, whereas men don't seem to be significantly affected in the same way. Thus when performing with objects, women need at least some kind of 'humanness' in an object to improve their attitude towards it. To be more specific, when hugging an object with feminine features, women gain an exceptionally positive attitude about it. All in all, this study has added confirming data to already existing theoretical frameworks and created a whole new segment of gender differences that can be addressed by the marketing and scientific world as well.

5.3 Practical implications

From an economic perspective, the findings of this study can be interpreted in many ways and offer different possibilities for practical implications. For once, it shows that it is best for companies who are involved in the production of durable consumer goods that require a haptic interaction, to involve anthropomorphic traits in the production cycle in one way or another. Car manufacturers for example can use this information to focus their design more on a human resemblance. By shaping the front of the car more like a human face and implementing more navigational devices with a typical human voice, consumers will perceive the car more as another human being or companion. This in turn, as indicated by this study, will lead to higher product evaluations as people are performing affectionate gestures like stroking the wheel or washing the car. Therefore, it becomes more likely that customers will hold onto their car as long as possible and that they will purchase a new car from the same brand if it is needed. One might assume that a prolonged ownership of the same car has no value for the manufacturing brand as those consumers take a longer duration to buy a new car. Yet, an increased number of loyal satisfied clients who are driving around in the brand's cars has its own benefits from which the manufacturer can profit.

As it was found that female anthropomorphic traits are able to even increase this effect, it is advised to prioritize feminine features if possible. A good example for this is given by Apple's application 'Speech Interpretation and Recognition Interface' or short SIRI. This app, used by Apple's own mobile operating system iOS, functions as a personal assistant and knowledge navigator. Using voice recognition, Siri is able to make reservations at restaurants, give weather reports or navigations to the user. Through the assistance of its artificial intelligence programming, Siri is able to adapt to the consumers individual language usage and search preferences. The important thing to note though is that all of Siri's responds are expressed by a female voice and thereby anthropomorphize the used device. This probably unknown implementation of this study's outcomes again leads to increased product evaluations of iPhones and iPads as consumers interact with the gadget through the use of

strokes and punctual touches. It is recommended to further implement and extend this method to other domains as well to benefit from this effect.

On top of that, it is proposed that respective brands should communicate to their consumers that their products have a certain personality and emphasize already existing human-like features. An elaborated marketing campaign, centered around this notion should be able to further strengthen the found effects and commit clients. Commercials for example could highlight the role of a new smartphone as an assistant and companion who is always available to the client's needs. This strategy will lead people to think of the smartphone as another human-like entity and promote the human-product relationship.

5.4 Limitations

As indicated earlier, this research stumbled across some restrictions that might have affected the outcomes and that should be avoided in future scientific attempts of this matter.

For once, some of the used scales in this study could have been extended by containing more items so that they are able to better reflect the participants' different states of mind. This goes first and foremost for the three-item loneliness scale by Hughes et al. (2004). In hindsight, it seems inappropriate to measure such a delicate construct like feelings of loneliness with only three items. People are very sensitive in reporting their own vulnerability and one should respond to that by making it as easy and reconcilable as possible for the participants to report their opinion and indicate even small exceptional characteristics.

In addition, it became obvious that the preparation of the clock led to some irritations. Proven by the low levels of purchase intention and quality, the conclusion can be drawn that participants had problems in regarding the clock as a normal product that can be bought in a regular shop. Because of a lack of financial resources it was chosen to attach the human features with transparent adhesive tape. Similar future researches should chose to display the features on the insight of the clock in a professional manner so that no alterations of the clock can be seen and the product appears like it was put together this way.

There is also the need to address the reliability of the used concepts in this study. Although most concepts like 'Need for Touch' or emotional attachment were able to achieve a good or even very good Cronbach's alpha, the items related to the concept of product attitude had their problems in achieving the same level. It should definitely be attempted to improve the resulting reliability by including a broader range of items relating to product attitude in the questionnaire out of which the concept can be build. Thought should thereby be given to only implementing either Likert-scale or bipolar items so that possible biases can be prevented.

Last but not least, the sample of participants offers room for improvement as well. As the number of 145 respondents might seem fairly decent, there are some conditions with a low number of participants (for example: 19 men in each the neutral and feminine condition). For the benefit of an

improved validity, a sample of at least 30 participants in every condition would serve an useful purpose.

5.5 Future research

On the basis that this paper was the first to address gender differences in product evaluations after performing meaningful gestures with anthropomorphized products, there is room for future assessments of this matter.

For instance, this study did not take the subject's sexual orientation into account. It can be presumed that homosexual or bisexual people for example respond differently to gendered cues such as sensual eyes, lips and so on. Yet, for this research purpose a study with a big sample of participants would be needed to achieve a sufficient amount of subjects in every condition.

Furthermore, it might be interesting to let people respond to open questions and find out how exactly they perceive differently anthropomorphized products. This qualitative scientific approach would offer an interesting equivalent in revealing the specific thought processes of the consumer. Knowledge would be gained explaining why certain features appear to be more appealing than others and what kind of characteristics, that have been excluded so far, should be incorporated. Naturally it would also be beneficial as well to investigate the found effects with other stimuli material (like books, smartphones and tablets) or different gestures.

All in all, there is a great potential to broaden the scope of this topic and explore further underlying factors and circumstances. Subsequent investigations in this direction would not only be of use for economic and scientific implementations, but would also carry on the first step this research has taken in revealing gender differences in affectionate consumer-product interactions.

6. References

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7. Appendix

Appendix A: Informational brochure during the experiment

Hugging Clocks

First of all thank you for your participation in this study! In this research we are investigating the effects that occur when people interact with everyday products. Because consumers often have to carry products between different locations, product manufacturers wish to know how consumers feel when carrying products. Therefore, in the first part of this research you will have to transport the clock lying in front of you on the table through the building to a certain location and back.

If you have any questions during the experiment or you are not sure what to do, please don't hesitate to ask the researcher.

Now:

- Step 1:** Please take a good look at the clock and familiarize yourself with it. Try to get a good understand of all of its features before continuing with this study.
- Step 2:** Lift the clock up and hold it in front of your upper body like you would give it a hug. This gesture should somewhat look like the following:



- Step 3:** Using this gesture, carry the clock to room C238 and back. It is important that you hold on to the clock by only using this motion. Please try to avoid any interference that might come along your way.

To help you find the right room here is a map to make things easier:



Step 4: When you return, please put the clock back on the table and proceed with the study by filling out the questionnaire to your right.

This was the last step, thanks again for your participation!

Appendix B: Cronbach's alpha of all items included in constructs

Construct	Item	N	M	SD	α (if item deleted)
Purchase intention	Buy clock in the future	145	3.10	1.44	.865
	Buy this clock	145	3.28	1.52	.833
	Buy clock if new clock is needed	145	3.53	1.72	.890
Emotional attachment	Affectionate	143	4.34	2.19	.919
	Connected	143	4.50	2.41	.912
	Friendly	143	5.85	2.40	.922
	Loved	143	3.90	2.30	.920
	Peaceful	143	6.36	2.34	.929
	Passionate	143	3.20	2.11	.921
	Delighted	143	4.41	2.11	.922
	Captivated	143	3.68	2.03	.917
	Bonded	143	4.22	2.35	.916
Anthropomorphism	Free will	145	1.54	1.33	.865
	Experience emotion	145	2.04	2.01	.882
	Mind of its own	145	1.63	1.53	.858
	Consciousness	145	1.64	1.61	.868
	Intentions	145	1.94	1.99	.882
Feelings of loneliness	Lack of companionship	145	1.56	.54	.730
	Left out	145	1.48	.52	.608
	Isolated from others	145	1.50	.57	.699
Need for Touch	All kinds of products	145	3.97	1.84	.839
	Can be fun	145	5.21	1.49	.854
	Place trust before purchase	145	5.46	1.37	.855
	Physically examining	145	5.42	1.28	.860
	Browsing stores	145	4.33	1.72	.834
	Worth buying	145	3.59	1.66	.874
	More confident after touching	145	4.99	1.29	.856
	I like to touch products	145	4.40	1.87	.850
Product attitude (original)	Likeable	143	5.61	1.22	.398
	Personal fit	143	3.18	1.40	.429
	Quality	143	3.58	1.39	.543
	Interesting	143	3.87	1.52	.511
	Pleasant	143	4.62	1.09	.428
Product attitude (adapted)	Likeable	142	4.63	1.24	.619
	Attractive	142	4.06	1.29	.598
	Friendly	142	5.15	1.49	.628
	Interesting	142	3.90	1.53	.626
	Pleasant	142	4.63	1.10	.570