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The Influence of Consumption Vocabulary on the Encoding and Retrieval of Haptic Information

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Abstract

Sensory stimuli are often ambiguous, which makes it difficult for consumers to encode and retrieve them, and to construct their preferences. This project studies whether, in a pre-purchase context, consumption vocabulary can help consumers to perceive what products are superior on haptic attributes. In an experiment with bed pillows, participants provided with evaluative criteria preferred the pillow with superior haptic attributes more often and to a larger extent than participants who had no evaluative criteria, which suggests the provision of criteria has a positive influence on preference construction. Improvements in memory for haptic attributes and disconnection from incongruent market information derived from that provision were not confirmed.

Keywords: consumption vocabulary, haptic perception, preferences, memory

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1. Project Purpose

Everyday, people receive a wide variety of sensorial stimuli from their environments, captured by the sensory channels of sight, hearing, taste, smell and touch. Indeed, consumption has a multisensory nature (Hirschman and Holbrook, 1982; Holbrook, 1982, 1983a) and a product's intrinsic cues such as tactility, color and smell are often more important in a product's perceived quality than extrinsic cues, as price, brand name, or store image (Szybillo and Jacoby, 1974).

In line with attribution theory, which concerns how people arrive at causal inferences and the consequences of those inferences (Folkes, 1988; Heider, 1958), it has been suggested that consumers make causal inferences about product quality and performance based both on intrinsic and on extrinsic cues, with certain cues influencing the evaluation of others (Citrin et al., 2002) (e.g. price cues may influence quality expectations).

Given the noticeable impact of sensorial stimuli on consumers' decision making and the implications it may have for marketing practices, a lot of research over the last decades has focused on better understanding that influence, ranging from the influence of colors (e.g. Gorn et al., 2004; Hoegg and Alba, 2007), scents (Kahn et al., 1995; Spangenberg et al., 2006), music (e.g. Milliman, 1982; Yalch and Spangenberg, 1990), to other stimuli captured by the five senses.

Despite the informative and persuasive roles that market communications assume in guiding consumers (Keller, 2001), consumers are often unable to make sense of all the information they are exposed to, even when they are in direct contact with the products in a shopping context. This happens in part because consumers have difficulty properly

encoding the attributes of complex products (Hoch and Deighton, 1989; Holbrook, 1981), which ends up preventing them from maximizing the utility they get from their consumption experiences (West et al., 1996).

In recent years, some studies have focused on how the provision of vocabulary related to consumption can help improving decision making in a pre-purchase context. Namely, it has been shown that the provision of consumption vocabulary helps to encode, align and retrieve sensory attributes that are diagnostic in assessing the quality of products, namely in what concerns visual (West et al., 1996) and sound attributes (Holbrook and Bertges, 1981; Shapiro and Spence, 2002).

The main purpose of this project is to extend the existing research on how language – specifically vocabulary – influences preference formation and the ability to extract utility more consistently from the consumption experience, by assessing if the effects generalize to haptic attributes (i.e. related to touch attributes). Can consumption vocabulary help consumers to understand what products inside a category are better in terms of haptic attributes? Will it help them to retrieve information they collect by touch and disconnect from externally available information? Or, on the other hand, is the sense of touch so self-sufficient that is not affected by the provision of vocabulary? Answers to these questions may help to understand how it is possible to enhance consumers' decision making in the processing of products' sensorial stimuli and if or when it is worth for marketers to provide this tool to consumers.

2. Conceptual Background

2.1. Touch and Haptic Information

By observing different shopping contexts, one can easily notice that the sense of touch is often used by consumers to better assess the characteristics of some products. Indeed, tactile stimulation can play an important role in shopping behavior (Fiore, 1993; Grohmann et al., 2007; Holbrook, 1983b) and in recent years research has been conducted on the role of touch on product judgements (Grohmann et al., 2007; Peck and Childers 2003a, 2003b) and decision making (McCabe and Nowlis, 2003).

Touch has been defined as the sensations aroused through stimulation of receptors in the skin (Stevens and Green, 1996) and the term "haptics" was adopted by Gibson (1966) to refer to the seeking and the pickup of information by the hand. The importance of the use of haptic information (information collected by touch) versus other sensory cues on products' evaluations was found to vary according to the diagnosticity it provides. For instance, while visual cues may dominate in spatial encoding tasks such as judgements of size and shape, other tasks may be dominated by tactile cues (Fiore, 1993; Klatzky et al., 1987).

Past research on touch perception focused on object properties, the corresponding hand and finger movements used to sense the objects, and the mental representations people have of the experience (Klatzky et al., 1990, 1992, 1993a, 1993b). Klatzky et al. (1990, 1993) classified objects into two categories: geometric – whose dominant attributes are size or shape – and material – whose dominant attributes are texture, roughness, hardness, weight, and temperature. Research found that to access geometric attributes of a product people rely mostly on visual cues, whereas touch plays the primary role when perceiving material

objects, such as clothing (Klatzky et al., 1990, 1993; McCabe and Nowlis, 2003).

However, not all consumers react to the availability of haptic information the same way. In line with previous evidence of a relationship between individual differences in the chronic accessibility of particular constructs and differences in responding to stimuli (Higgins and Brendl, 1995; Higgins et al., 1982), research demonstrated that individuals differ on their willingness to haptically evaluate products before purchase and therefore react differently to the availability of haptic information (Citrin et al., 2002; Peck and Childers, 2003a). In fact, Holbrook and Hirschman (1982) found that the need to haptically examine products can be driven by motivations either associated with consumers as problem solvers or with consumers seeking fun, fantasy and arousal. As a result, these authors classified haptic information as being either instrumental or autotelic: instrumental information is more intrinsic to the product and more specific to the goal-directed evaluation of a product's performance, whereas autotelic information is related to the sensory experience and hedonic appreciation of the product (Holbrook and Hirschman, 1982). Measures of need for tactile input were developed as well (Citrin et al., 2002; Peck and Childers, 2003b).

Characteristics of the situation were also found to increase or diminish the opportunity to engage in direct haptic experiences (Peck and Childers, 2003a). For instance, in-store obstacles and internet are situations found to diminish the opportunity to experience a product through touch (Peck and Childers, 2003a). Consistent with that, research suggested that individuals with a higher need for tactile input in making product choices will be less likely to purchase products on the internet (Citrin et al., 2002), as happens with other goods requiring multisensory input before the purchase decision (Phillips et al., 1997). Peck and

Childers (2003a) found that consumers with higher need for touch feel more confident when they can touch the product and that barriers to touch affect their frustration in product evaluations. McCabe and Nowlis (2003) showed that products' material or geometric attributes mediate the relation between need for touch and the shopping environment: products' material properties can be examined more accurately in-store, whereas objects with geometric properties can be examined accurately either in in-store or remote environments (as internet or catalogues).

Despite that inability to assess products' attributes in some contexts, research showed that it is possible to use mechanisms that compensate for that impossibility. Petty et al. (1983) stated that, under certain conditions, to provide additional information (about the products) would compensate for the inability to experience a product directly, while Peck and Childers (2003a) found that visual compensatory mechanisms, like a written description of the products' haptic attributes, could be an alternative to the inability to touch and could increase confidence in choice. The use of product packaging that enables haptic exploration was also suggested as an alternative to directly touch products (Peck and Childers, 2003a).

2.2. Consumption Vocabulary

In recent years, some research has focused on how the provision of consumption vocabulary may influence preference formation as well as on how it can help consumers to achieve higher utility from their consumption experiences. In this context, vocabulary has been defined as a taxonomy or framework that allows people to identify product features, to evaluate the levels of those features, and finally to identify the relationship between those features and their own evaluations of the product (Hoch and Deighton, 1989; Lynch, 1985).

With a rising variety of products available in the market, consumers often find it hard to make product choices. This happens in part because consumers have difficulty properly encoding the attributes of complex products (Hoch and Deighton, 1989; Holbrook, 1981), this is, difficulty in understanding which are the most relevant attributes of the products, on which they should base their evaluations. This in turn keeps them from learning their own preference functions and consequently from maximizing the utility of their consumption experiences (West et al., 1996).

However, literature suggests that consumers' understanding of their own preferences can be aided by a "consumption vocabulary" that facilitates identifying the relation between a product's features and one's evaluation of the product (West et al., 1996). Consumption language simplifies the execution of preference-related thought, allowing consumers to make fewer evaluation errors (Hunt and Agnoli, 1991) and it was even suggested that, without a framework provided by an effective consumption vocabulary, consumers' understanding of their own preferences will require more extensive experience and may never fully develop (West et al., 1996).

Hoch (2007) reinforces that, in a retail environment, consumption vocabulary on packaging and merchandising materials may help consumers to better understand what a product offers, why they should buy it, as well as understanding their preferences for future reference. This author argues that this is particularly important when a shopper is on his own and cannot count on store employees for advice, as the interpersonal dialogue he would have with the employee can be substituted by an internal dialogue (self-dialogue), in which consumers use the provided consumption vocabulary as a guide.

Evidence for this was found in several studies. In a study by Holbrook and Bertges (1981), novices provided with rating schemes to evaluate different dimensions of a musical piece were as good as experts in rating multiple performances of that piece, which showed how provision of specific vocabulary renders people without experience in the evaluation of a product as capable as people who already have knowledge to encode its attributes.

Additional evidence was found in a study conducted with quilts containing complex visual patterns, where participants were asked to rate 70 quilts based on their preferences (West et al., 1996). Preferences of people provided with rudimentary vocabulary related to the product's intrinsic attributes (as the number of colors and blocks or the blocks' arrangement) were more stable and consistent than for participants exposed to simple information about the history of the quilts (as dates and nicknames).

Hoch and Ha (1986) suggested that providing evaluation criteria to interpret otherwise ambiguous sensory attributes could moderate the assimilation effect, i.e., making the evaluation of a product in the direction of the available market information. Evidence for this was found in a study by Shapiro and Spence (2002). In their study, participants were asked to compare two stereos and rate their relative superiority. While some subjects were provided with evaluative criteria (sound clarity, how "full bodied" the sound was and the range of instruments they could hear), the others were not. Results showed that evaluative criteria had positive effects on encoding and memory for the sensory attribute. Moreover, subjects who were given evaluative criteria also placed greater weight on the sensory attribute (vs. market information) during the brand choice, which showed a moderation of the assimilation effect as previously suggested by Hoch and Ha (1986).

Despite the advantages it can provide to the consumers, however, "consumption vocabulary is not a free lunch" (Hoch, 2007). With well-developed vocabulary, the consumer is empowered to make better decisions based on the difference in quality between products, while in many cases the seller may prefer the consumer's decision to be driven by other factors, as lower price (Hoch, 2007).

3. Consumption Vocabulary and Haptic Information - The Hypotheses

As mentioned before, previous research found significant results of the provision of consumption vocabulary in enhancing preference formation, memory for sensory attributes, and reduction of the assimilation of preferences to market information in favour of the sensory attribute. The hypotheses of this study come in line with those conclusions, but with a focus on the encoding of haptic attributes.

West et al. (1996) found that the provision of consumption vocabulary had a positive impact on the preferences' stability in terms of visual attributes and Shapiro and Spence (2002) showed there was stronger preference for a brand with superior sound attributes when criteria to evaluate two sound stereos were provided. It is expected that the provision of consumption vocabulary, in the form of evaluative criteria, may also help consumers to understand which products have better haptic attributes.

H1: There will be greater preference for a product that is superior on haptic attributes when evaluative criteria are provided compared to when no evaluative criteria are provided.

Johnston and Uhl (1976) stated that memory for an item is positively correlated with the degree to which it has been processed in different cognitive environments. Siegel and

Siegel (1976) found that memory for colors improved if they provided a rating scheme (in which numbers were placed on the colors blue, green, yellow and red), while Shapiro and Spence (2002) demonstrated that the memory for sound attributes improved when consumers had criteria to evaluate them. It is expected that the provision of evaluative criteria will enhance memory for haptic attributes as well.

H2: Memory for the haptic attributes will be better when evaluative criteria are provided compared to when no evaluative criteria are provided.

Shapiro and Spence (2002) found that subjects who were given evaluative criteria to compare two sound systems placed greater weight on the sound perception attribute during the brand choice, when market information from Consumer Reports was also available. It is expected that consumers also rely more heavily on their haptic perception when they are provided with evaluative criteria compared to when they are not.

H3: There will be higher reliance on haptic perception relative to market information when evaluative criteria are provided compared to when no evaluative criteria are provided.

Another aspect this study aims to ascertain is whether, in the presence of incongruent market information, consumers are more able to disconnect from that market information if they are provided with consumption vocabulary. Peck and Wiggins' (2006) definition of congruence emphasized the congruence between touch information and the message into which it was incorporated. In this project, the congruence between the touch information (perception) and the market information is explored, where incongruent information is seen as information that is not in accordance with the quality of a product's haptic characteristics.

Feldman and Lynch (1988) proposed that information use is positively related to its perceived diagnosticity. If information attached to a product is considered diagnostic, it is expected that consumers are influenced by that information when making their evaluations, with congruence between market information and perception positively affecting their preferences and incongruence of market information having a negative impact on them.

H4a: There will be greater preference for a product that is superior on haptic attributes when congruent market information is present compared to when incongruent market information is present.

Conflicting market information was used by Shapiro and Spence (2002) to assess the impact of the provision of criteria when the sensory perception and the available market information are not in agreement, particularly if subjects with criteria were more able to "disconnect" from the market information and primarily use the haptic sensory attributes in their evaluations. This effect was confirmed in terms of product sound attributes, and it is expected to prevail in the evaluation of products whose diagnostic attributes are haptic.

H4b: In the presence of incongruent information, the provision of criteria will reduce the assimilation of preferences to market information.

4. Experiment

4.1. Research Overview

The main objective of this project is to understand the impact of the provision of consumption vocabulary on the encoding of haptic information when evaluating products whose haptic attributes are diagnostic of the products' quality. The study will focus on four

particular aspects, in the context of a product choice task: 1) The extent to which the provision of criteria affects consumer preferences; 2) The extent to which the provision of criteria affects the retrieval of haptic attributes; 3) The effect of the provision of criteria in the relative usage of haptic sensory attributes versus market information; and 4) How these relationships are affected by the congruence, or lack thereof, between the available market information and the quality of the products. To study this, an experiment was run, in which participants assessed the haptic quality of two products in different information scenarios.

4.2. Experimental Design

To examine the hypotheses, a 2x2 fully-crossed, between subjects factorial design was applied. The treatment conditions varied in the provision of consumption vocabulary (haptic evaluation criteria provided vs. no criteria provided), and in congruence between the available market information and the quality of the products (congruent vs. incongruent).

4.3. Subjects

Hundred twenty subjects (44% male), both undergraduate and masters students from the Faculdade de Letras da Universidade de Lisboa, participated in the study. The average age of the participants was 23, with a minimum of 17 and a maximum of 33. The first 40 subjects participated in the pretest and the other 80 were randomly assigned to the treatment conditions of the main experiment.

4.4. Stimuli development

The product to be used in the experiment had to meet three conditions: it had 1) to be one for which haptic attributes were diagnostic of its quality, being important for consumers in

general to assess those attributes before its purchase (validated in the pretest); 2) to be familiar to the participants in the study (based on Shapiro and Spence, 2002); 3) to include distinguishable touch-related attributes that contributed meaningfully to the consumers' preference evaluations (based on West et al., 1996). Bed pillows met these conditions.

Two pillows were developed, identical on some attributes, as size and weight, while different on two haptic attributes that could be considered important for the subjects to evaluate: the consistency of the filling material and the softness of the outer fabric. One pillow was intended to be noticeably, but not obviously, better in the quality of its haptic attributes. The pretest confirmed these conditions, as will be described in the next section.

The pillows were placed in two similar boxes identified as A and B. The pillows were hidden to avoid possible influence of visual cues.

4.5. Pretest

The pretest was done with 40 subjects to check for the importance of touching pillows before purchase and to get measures of the touch quality of the pillows for the main study. The importance of touching a pillow was verified by asking participants what characteristics would be important for them to evaluate before purchasing a bed pillow (Appendix 1a). 87.5% of the subjects mentioned haptic attributes (consistency/homogeneity of the filling material, softness/hardness, and texture/softness/homogeneity of outer fabric), with 65.7% of those subjects mentioning them in the first place, while for instance price was mentioned by only 35% of the subjects. This confirmed that it was a product for which touch attributes are important to assess before the purchase.

To check for the touch quality of the two pillows, participants were then asked to rate them in terms of touch quality (Appendix 1b). The subjects had access to the boxes containing the pillows (Appendix 2) and were informed they could touch them separately or simultaneously, putting their hands inside the boxes. They rated the two pillows on an 11-point scale, where 0 meant "This pillow has very poor quality", 5 meant "This pillow has an average quality" and 10 meant "This pillow has excellent quality" (based on Shapiro and Spence, 2002). No additional information was presented. As expected, pillow A had a lower average evaluation (M_A = 4.5) than B (M_B = 6.8), and a paired-samples t-test revealed the difference was significant ($p < .001$) (Appendix 3).

The average ratings given to the pillows in the pretest were used as the Consumer Ratings (henceforth referred to as CR) in the main experiment (based on Shapiro & Spence, 2002), being either assigned to the corresponding pillow (in the congruent information conditions) or to the non-corresponding pillow (in the incongruent information conditions). In the context of a pre-purchase situation, consumers often rely on customer ratings before making purchase decisions, so it was expected that the CR assigned to the pillows would be considered by the participants in the study when making their evaluations.

4.6. Procedure

The main experiment was conducted in the Biblioteca da Faculdade de Letras da Universidade de Lisboa, in a study room. Students were invited to participate in the study from their desks and informed that it was a 10-minute experiment for my Work Project. No additional details were provided.

Participants were asked to imagine they were about to buy a bed pillow. This was expected to induce a pre-purchase task orientation. The reference to the functional utility, i.e. “bed pillow” instead of just “pillow”, was to create a higher level of involvement of the subjects in the task of evaluating the touch quality, which could be lower in case it was e.g. just a decoration pillow. It was also to avoid the possible question what the pillow was for.

An informative part followed. Participants were informed about the meaning of the CR displayed on the top of the boxes and about the fact that those results came from a survey with students from their University (in a way participants could identify with the “market”). As mentioned before, in the congruence conditions, pillows were paired with the respective ratings from the pretest, while in the incongruence conditions the best pillow was paired with the worst CR and the worst pillow was paired with the best CR.

Additionally, participants in the criteria conditions were provided with two criteria associated with two haptic attributes of the pillows: a) Consistency of the filling material and b) Smoothness of the outer fabric. The criteria were written on a paper that was put on the top of the boxes, between the two CR. Subjects were told those were criteria that people often use to assess the quality of pillows before purchase (based on Shapiro and Spence, 2002 and on West et al., 1996). Participants in the no criteria condition had no access to this information. (Appendix 4 to see the four information conditions)

After the informative part, the participants were asked to touch each pillow for 30 seconds to assess its quality (time was controlled to avoid the impact of the differences of duration on the results). The exposure was counterbalanced (i.e. some subjects touched pillow A first, while others touched B first) to control for order effects.

After the touch part, participants were asked to fill out the questionnaire (Appendix 5), which included, based on Shapiro and Spence (2002), the following measures:

1) Brand comparison measures - Subjects were asked to indicate which pillow they thought had superior touch quality and the extent to which they preferred one pillow over the other on a -10 to +10 scale, where -10 meant pillow A was far superior to pillow B, 0 meant pillows had the same quality, and +10 indicated pillow B was far superior to pillow A.

2) Measure of the importance of sensory attribute vs. market information in the evaluation - Participants were asked to indicate how important their perception of touch was relative to the knowledge of the CR when making the brand comparison, by allocating 100 points across those two attributes.

3) Manipulation check for the importance of touching pillows before purchase - determined using two 11-point scales with the end-points “strongly disagree” and “strongly agree” for the sentences a) It is very important to me to touch a pillow before buying it, and b) I would never consider buying a pillow without touching it first.

4) Memory measures - The measure of memory for the sensory attribute consisted of a forced-choice question. Participants were asked to touch one of the pillows again and to indicate which of the pillows (A or B) it was. All the information that enabled identification of the pillow was hidden (as in Appendix 6). If they were uncertain they were asked to guess. The design was counterbalanced in terms of the pillow provided: half of the participants received pillow A, the other half received pillow B. In addition, subjects were asked to indicate how confident they were, on a percentage scale, that their answer was correct.

The last question asked what participants thought was the purpose of the study. After completion, they received a chocolate bar and were thanked for their participation.

4.7. Results

The data were analyzed through SPSS (version 16.0).

Chi-square and Mann-Whitney tests were used to analyze the impact of the independent variables Criteria and Congruence on the dependent variables Preferred pillow, Extent of preference, Memory for the pillow, Confidence in memory and the Relative importance of the perception of touch to make the evaluation. The non-parametric Mann-Whitney test was chosen because it is considered the appropriate alternative to the usual t-test for equality of means when the assumption of normality of the populations being compared is not met, condition confirmed by running the Kolmogorov-Smirnov test before any of the Mann-Whitney tests (Appendix 7). The required condition of equality of variances to perform the Mann-Whitney when the data does not follow a normal distribution was confirmed before running that test (Appendix 8).

In the analysis of the impact of the provision of criteria on preferences, cross-tabulation analysis between preferred pillow and provision of criteria (Appendix 9) showed that a higher percentage of participants preferred the best pillow in the criteria condition (82.1%) compared to the no criteria condition (62.2%), and the Pearson Chi-Square Test revealed the association between preferred pillow and the provision of criteria was marginally significant ($\chi^2(1, n = 76) = 3.756$, $p < .06$). Furthermore, in a more detailed analysis to the extent of preference (where higher extent of preference meant they thought the best pillow had quality superior relative to the worst pillow), the Mann-Whitney test (Appendix 10)

revealed that the extent of preference for the best pillow was significantly higher ($z = -2.127$, $p < .05$) in the criteria condition ($M_{criteria} = 3.72$) than in the no criteria condition ($M_{no\ criteria} = 1.72$). Therefore, there is evidence supporting Hypothesis 1.

In the analysis of the impact of the provision of criteria on memory for haptic attributes, cross-tabulation analysis between guessing what pillow it was (in the mystery pillow question) and provision of criteria (Appendix 11) showed a high percentage of participants guessed what pillow was hidden both in the criteria condition (92.5%) and in the no criteria condition (95%). The Pearson Chi-Square Test confirmed there is no significant association between guessing what pillow it was and the provision of criteria ($\chi^2(1, n = 80) = .213$, $p > .1$). Additionally, in the analysis to the confidence level about the guess (being inferred that higher confidence level meant better memory), the Mann-Whitney test (Appendix 12) revealed that the confidence level was also not significantly different ($z = -.005$, $p > .1$) between the criteria ($M_{criteria} = 87.25\%$) and the no criteria conditions ($M_{no\ criteria} = 88.5\%$). Given this, no evidence was found to support Hypothesis 2.

Analyzing the impact of the provision of criteria on the importance of touch perception to make the quality/preference judgment, contrarily to what was expected, the average importance attributed to the perception of touch to make the quality/preference judgment was lower in the criteria condition ($M_{criteria} = 79.12$) than in the no criteria condition ($M_{no\ criteria} = 82.38$) (Appendix 13), and consequently the average importance attributed to the knowledge of the ratings was higher in the criteria condition ($M_{criteria} = 20.88$ vs. $M_{no\ criteria} = 17.62$). The Mann-Whitney test revealed those results were not significantly different ($z = -1.349$, $p > .1$). Given this, no evidence was found to support Hypothesis 3. Note to the fact

that in this case the homogeneity of variances condition to run the Mann-Whitney test had not been confirmed (Appendix 8), which might have impaired the analysis, although it does not seem to affect the conclusion that Hypothesis 3 found no support.

In the analysis of the impact of the congruence of information on preferences, cross-tabulation analysis (Appendix 14) showed that a higher percentage of participants chose the worst pillow in the incongruent condition (79.5%) than in the congruent condition (64.9%), even if the Pearson Chi-Square Test showed no significant association between preferred pillow and the congruence of information ($\chi^2(1, n = 76) = 2.030$, $p > .1$). Additionally, the extent of preference for the best pillow was higher in the incongruent information condition ($M_{incongruent} = 2.82$) compared to the congruent condition ($M_{congruent} = 2.62$). However, the Mann-Whitney test (Appendix 15) revealed that it was not significantly higher ($z = -.222$, $p > .1$). Therefore, no evidence was found to support Hypothesis 4a.

The Mann-Whitney test (Appendix 16) revealed that within the group in the incongruent information condition, the extent of preference for the best pillow was higher in the no criteria condition ($M_{no\ criteria} = 3.35$) than in the criteria condition ($M_{criteria} = 2.30$), even though this difference is not significant ($z = -.599$, $p > .1$). Therefore, no evidence was found to support Hypothesis 4b.

The importance of touching a pillow before purchase was confirmed with an average of 4.46, on the scale from -5 to 5, attributed to the sentence "It is important for me to touch a pillow before buying it" and an average of 3.81 attributed to the sentence "I would never consider buying a pillow without touching it", with 97.5% of the participants agreeing with the first sentence and 91.3% with the second (Appendix 17).

5. Discussion

As predicted in the first hypothesis, the results support the idea that the provision of criteria can positively affect the preferences for a product with superior haptic attributes. There was a higher percentage of participants indicating they preferred the pillow with best haptic attributes in the criteria condition than in the no criteria condition and, when comparing the best and the worst pillow, participants in the criteria condition on average considered that the best pillow had better quality than the worst pillow to a higher extent than the participants who received no criteria.

The remaining hypotheses found no support. In what concerns the effect of provision of criteria in the memory for the haptic attributes, the memory for the haptic attributes was very high either if the participants were provided with criteria or not, which was also illustrated by the high confidence levels, which led to no significant differences found between the two groups. These results seem to suggest that the memory for haptic attributes may be so strong that is not conditioned by the provision of externally provided consumption vocabulary. However, caution must be taken in drawing such conclusion, as some limitations of the study may have affected the memory results. Namely, to make sense to provide the participants vocabulary regarding two haptic dimensions, the objects used in the study had to be noticeable different on those two dimensions, which may have simplified the distinction in the participants´ memory, independently of the condition.

No significant results were found either in terms of differences in the importance the participants attached to the touch perception compared to the market information, between participants provided with criteria and participants who were not. Again, in both conditions

the participants highly relied on touch perception to make their evaluations, with around 80 points out of 100 attributed to the perception, even if the same results show the participants admitted to be influenced by the ratings to make their evaluations. Although the hypothesis of higher importance attached to the touch perception in the presence of criteria was not supported, it is worth to note the importance attached to perception, as it supports the idea that for products to which the sensory attributes are diagnostic in perceiving their quality the consumers heavily rely on their sensory perceptions.

Contrary to expectations, the extent of preference for the best pillow was on average higher in the incongruent information condition than in the congruent information condition, even if not significantly. A possible explanation for this can be that, with market information that conflicted with their perceptions, subjects in the incongruent condition just took the market information as non-diagnostic information and decided to ignore it, rating the best pillow as having higher quality. However, there is not enough data to confirm this reasoning.

It was also expected that in the presence of incongruent market information, this is, with the best rating attached to the worst pillow, participants provided with criteria would be the ones that more easily disconnected from that market information, rating their preference in favour of the best pillow to a larger extent than the ones with no criteria, which would be interpreted as a reduction of the assimilation of preferences to market information. Surprisingly, despite the non-significant difference, participants who had no criteria expressed on average a higher extent of preference for the worst pillow.

Some limitations of the study may have led to the reduced significance of the results of this study, and to the support of only one of the hypotheses. First, the fact that the preferences

for a bed pillow are often subjective may have limited the use of the external information provided (both the ratings and the criteria) by the participants. Furthermore, there were participants who made comments regarding their own bed pillows while they were touching the pillows from the experiment, an influence that could not be controlled.

In the questionnaire, participants were asked what they thought was the purpose of the study. Thirty eight (47.5%) of the 80 participants mentioned that it was to study the influence of externally provided information, with 29 of those subjects mentioning the ratings directly. Therefore, it is possible that these participants predicted they were expected to be influenced by that information and made their valuations discounting its importance, which may also be seen as a limitation.

Another limitation was that it was not measured to what extent the participants gave importance to each of the pillows' haptic dimensions either in the criteria and the no criteria conditions, which left unknown if they relied more heavily on one of the dimensions.

If these limitations are addressed in future research, perhaps more conclusive knowledge can be achieved about the influence of consumption vocabulary on the encoding and retrieval of haptic information.

It would also be interesting to observe what happens in terms of the encoding and retrieval of haptic attributes when the objects being compared are more similar, or vary in only one haptic dimension. Another pathway would be to study the memory for haptic attributes in the medium and long run, as the present study focused only the short-term memory. Additionally, research on the impact of consumption vocabulary on the encoding and retrieval of smell and taste attributes are also an open avenue for future research.

6. Conclusion

The purpose of this study was to understand if the provision of consumption vocabulary in a pre-purchase context could help consumers to better assess the quality of products whose haptic attributes are diagnostic of their quality, as well as if it could have a positive impact on the retrieval of haptic information, and on the reduction of the assimilation of preferences to externally available information.

One of these objectives was achieved since, in the experiment, evidence was found to support the idea that when consumers are provided with criteria to evaluate two haptic dimensions of a product they show higher preferences for the product that was superior on haptic attributes. This finding extends the work of Shapiro and Spence (2002), who found similar effects in terms of sound attributes, and is consistent with previous research that showed consumption vocabulary helps to encode and align sensory attributes (Holbrook and Bertges, 1981; West et al., 1996).

This insight might be useful for companies that differentiate for quality in the sensorial attributes of their products, and want consumers to perceive more easily that their product is better than the others in the category. They may, for instance, use point-of-purchase displays that call attention to some dimensions of the product, or do it in the packaging, so there will be a higher chance that consumers make their evaluations based on the differentiated attributes. However, caution must be taken because, as Hoch (2007) suggested, a seller may prefer consumers' decision to be driven by other factors, as lower price, and in that case providing consumption vocabulary may not be so tempting.

The remaining hypotheses of the study were not supported, which left unanswered whether the provision of consumption vocabulary in a pre-purchase context may positively influence the memory for information collected by touch or if it may help consumers to devalue market information when it conflicts with their perceptions. Furthermore, it remains uncertain how the incongruent, or conflicting, externally available information can affect the consumers' haptic perceptions.

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8. Appendices

Appendix 1a - Pretest Questionnaire

Questionário nº | | | |

1) Indica que características consideras que seria importante avaliares antes de comprares uma almofada para dormir.

_____

_____

_____

_____

_____

_____

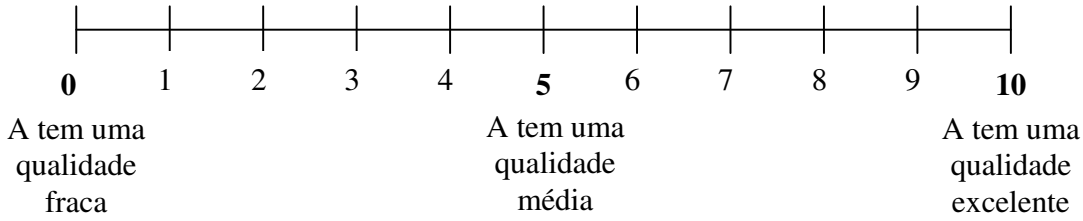
_____

Appendix 1b – Pretest Questionnaire

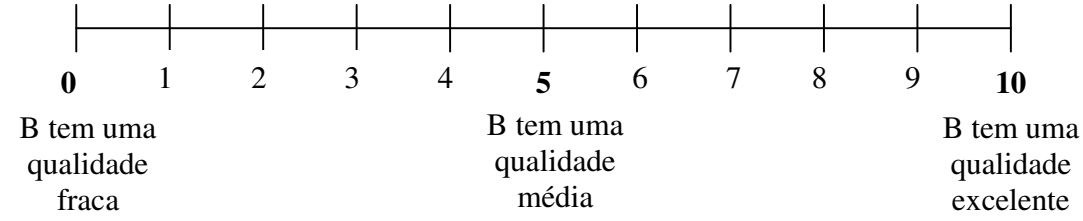
Questionário nº ☐☐☐

2) Agora vou pedir-te que toques em duas almofadas que estão dentro de duas caixas, A e B, e que avalies a qualidade de ambas. Podes tocar uma de cada vez e/ou as duas em simultâneo. Por favor faz um círculo nos valores que considerares mais indicados.

Almofada A



Almofada B



3) Indica:

Sexo: M ___ F ___

Idade: ___

Curso: Licenciatura ___ Mestrado ___

Obrigada pela tua participação!

Appendix 2 – Stimuli presentation in the pretest

Appendix 3 – Paired t-test for quality of pillows

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Quality of A	4.52	40	1.724	.273
	Quality of B	6.80	40	2.053	.325

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Quality of A & Quality of B	40	-.426	.006

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Quality of A - Quality of B	-2.275	3.194	.505	-3.297	-1.253	-4.504	39	.000

Appendix 4 – The treatment conditions

a. Without Criteria and
With Congruent Information

b. Without Criteria and
With Incongruent Information

c. With Criteria and
With Congruent Information

d. Without Criteria and
With Incongruent Information

Appendix 5 – Main Experiment Questionnaire

Questionário nº ☐☐☐

1. Por favor, responde às seguintes questões.

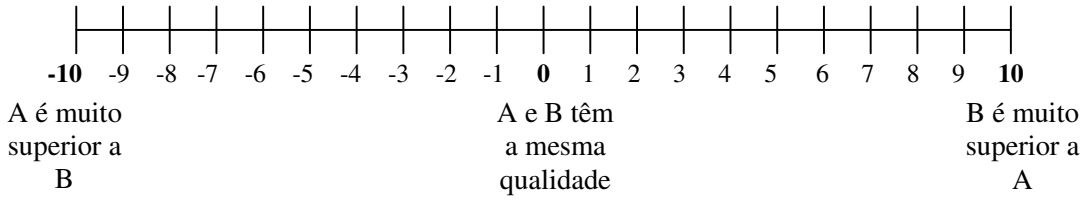
1.a) Que almofada consideras que tem maior qualidade?

A ___

B ___

A e B têm a mesma qualidade ___

1.b) Indica em que medida consideras que essa almofada tem qualidade superior em comparação com a outra almofada.



2) Por favor indica o quanto foi importante

i) a tua percepção do toque

ii) o conhecimento do rating atribuído às almofadas

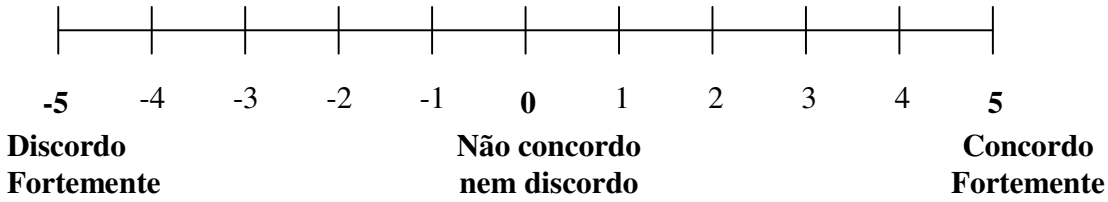
para te ajudarem na tua avaliação, dividindo 100 pontos entre as duas.

Exemplo: Atribuir 50 pontos a cada significaria que a Percepção do toque e o Conhecimento do Rating foram igualmente importantes para te ajudar a avaliar a qualidade da almofada.

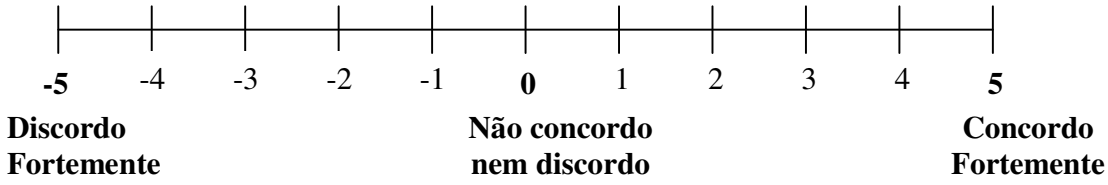
Percepção do toque	
Conhecimento do Rating	
Total	**100**

3) Por favor indica em que medida concordas com as seguintes frases.

a) É muito importante para mim tocar uma almofada antes de a comprar.



b) Eu nunca consideraria comprar uma almofada sem primeiro a tocar.

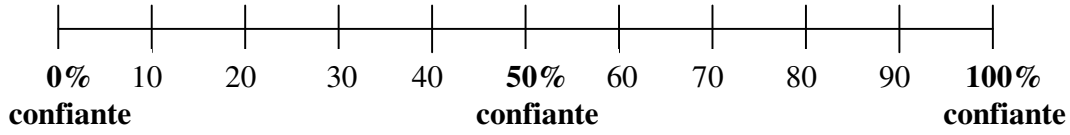


4.a) Agora, vou-te pedir que toques de novo numa das almofadas. Por favor indica que almofada é, A ou B. Se não tiveres a certeza, indica a que achas que poderá ser.

A ____

B ____

4.b) Por favor indica o quanto confiante estás de que a tua resposta está correcta.



5) Qual achas que é o objectivo deste estudo?

_____

_____

6) Indica:

Sexo: M ___ F ___

Idade: ___

Curso: Licenciatura ___ Mestrado___

Obrigada pela tua participação!

Appendix 6 - Stimuli presentation in memory check question

Appendix 7 - Kolmogorov-Smirnov tests

7.1. Tests of Normality – Extent of preference (Criteria vs. No criteria conditions)

	Criteria	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	Df	Sig.
Extent of preference	No criteria	.204	40	.000	.909	40	.004
	Criteria	.221	40	.000	.844	40	.000

a. Lilliefors Significance Correction

7.2. Tests of Normality – Confidence in guess (Criteria vs. No criteria conditions)

	Criteria	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	Df	Sig.
Confidence	No criteria	.259	40	.000	.708	40	.000
	Criteria	.265	40	.000	.763	40	.000

a. Lilliefors Significance Correction

7.3. Tests of Normality – Importance of Touch Perception (Criteria vs. No criteria conditions) and Importance of Knowledge of the Rating (Criteria vs. No criteria conditions)

	Criteria	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
Perception of how the touch felt	No criteria	.180	40	.002	.890	40	.001
	Criteria	.167	40	.006	.941	40	.038
Knowledge of the rating	No criteria	.180	40	.002	.890	40	.001
	Criteria	.167	40	.006	.941	40	.038

a. Lilliefors Significance Correction

7.4. Tests of Normality – Extent of preference (Congruent vs. Incongruent conditions)

	Congruency	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
Extent of preference	Incongruent	.214	40	.000	.837	40	.000
	Congruent	.199	40	.000	.896	40	.002

a. Lilliefors Significance Correction

Appendix 8 – Tests of Homogeneity of Variances

8.1. Test of Homogeneity of Variances - Extent of preference (Criteria vs. No criteria conditions)

Extent of preference

Levene Statistic	df1	df2	Sig.
.033	1	78	.857

8.2. Test of Homogeneity of Variances – Confidence in guess (Criteria vs. No criteria conditions)

Confidence

Levene Statistic	df1	df2	Sig.
.711	1	78	.402

8.3. Test of Homogeneity of Variances – Importance of Touch Perception (Criteria vs. No criteria conditions) and Importance of Knowledge of the Rating (Criteria vs. No criteria conditions)

	Levene Statistic	Df1	df2	Sig.
Perception of how the touch felt	4.126	1	78	.046
Knowledge of the rating	4.126	1	78	.046

8.4. Test of Homogeneity of Variances - Extent of preference (Congruent vs. Incongruent conditions)

Extent of preference

Levene Statistic	df1	df2	Sig.
1.501	1	78	.224

8.5. Test of Homogeneity of Variances - Extent of preference (Incongruent with Criteria vs. Incongruent with No criteria conditions)

Extent of preference

Levene Statistic	df1	df2	Sig.
.497	1	38	.485

Appendix 9 – Cross-tabulation analysis between preferred pillow and provision of criteria and Chi-Square Test

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preferred Pillow * Criteria	76	100.0%	0	.0%	76	100.0%

Preferred Pillow * Criteria Crosstabulation

			Criteria		Total
			No criteria	Criteria	
Preferred Pillow	A	Count	14	7	21
		Expected Count	10.2	10.8	21.0
		% within Criteria	37.8%	17.9%	27.6%
	B	Count	23	32	55
		Expected Count	26.8	28.2	55.0
		% within Criteria	62.2%	82.1%	72.4%
Total		Count	37	39	76
		Expected Count	37.0	39.0	76.0
		% within Criteria	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.756[a]	1	.053		
Continuity Correction[b]	2.827	1	.093		
Likelihood Ratio	3.805	1	.051		
Fisher's Exact Test				.073	.046
Linear-by-Linear Association	3.707	1	.054		
N of Valid Cases[b]	76				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 10,22.

b. Computed only for a 2x2 table

Appendix 10 – Mann-Whitney test for the significance of the difference between the extent of preference in criteria versus non criteria conditions

Group Statistics

	Criteria	N	Mean	Std. Deviation	Std. Error Mean
Extent of preference	No criteria	40	1.72	4.894	.774
	Criteria	40	3.72	5.272	.834

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Extent of preference	80	2.72	5.153	-8	10
Criteria	80	.50	.503	0	1

Ranks

	Criteria	N	Mean Rank	Sum of Ranks
Extent of preference	No criteria	40	35.00	1400.00
	Criteria	40	46.00	1840.00
	Total	80		

Test Statistics[a]

	Extent of preference
Mann-Whitney U	580.000
Wilcoxon W	1400.000
Z	-2.127
Asymp. Sig. (2-tailed)	.033

a. Grouping Variable: Criteria

Appendix 11 - Cross-tabulation analysis between guessing what pillow it was and provision of criteria and Chi-Square Test

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Memory Check * Criteria	80	100.0%	0	.0%	80	100.0%

Memory Check * Criteria Crosstabulation

			Criteria		Total
			No criteria	Criteria	
Memory Check	Does not guess	Count	2	3	5
		Expected Count	2.5	2.5	5.0
		% within Criteria	5.0%	7.5%	6.2%
	Guesses	Count	38	37	75
		Expected Count	37.5	37.5	75.0
		% within Criteria	95.0%	92.5%	93.8%
Total		Count	40	40	80
		Expected Count	40.0	40.0	80.0
		% within Criteria	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.213[a]	1	.644		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.215	1	.643		
Fisher's Exact Test				1.000	.500
Linear-by-Linear Association	.211	1	.646		
N of Valid Cases[b]	80				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.50.

b. Computed only for a 2x2 table

Appendix 12 – Mann-Whitney test for the significance of the difference between the confidence level about the guess in criteria versus non criteria conditions

Group Statistics

	Criteria	N	Mean	Std. Deviation	Std. Error Mean
Confidence	No criteria	40	87.25	18.672	2.952
	Criteria	40	88.50	15.115	2.390

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Confidence	80	87.88	16.891	10	100
Criteria	80	.50	.503	0	1

Ranks

	Criteria	N	Mean Rank	Sum of Ranks
Confidence	No criteria	40	40.49	1619.50
	Criteria	40	40.51	1620.50
	Total	80		

Test Statistics[a]

	Confidence
Mann-Whitney U	799.500
Wilcoxon W	1619.500
Z	-.005
Asymp. Sig. (2-tailed)	.996

a. Grouping Variable: Criteria

Appendix 13 – Mann-Whitney test for the significance of the difference between the importance attributed to touch perception relative to the market information in the evaluation in criteria versus non criteria conditions

Group Statistics

	Criteria	N	Mean	Std. Deviation	Std. Error Mean
Perception of how the touch felt	No criteria	40	82.38	16.679	2.637
	Criteria	40	79.12	12.501	1.977
Knowledge of the rating	No criteria	40	17.62	16.679	2.637
	Criteria	40	20.88	12.501	1.977

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Perception of how the touch felt	80	80.75	14.736	40	100
Knowledge of the rating	80	19.25	14.736	0	60
Criteria	80	.50	.503	0	1

Ranks

	Criteria	N	Mean Rank	Sum of Ranks
Perception of how the touch felt	No criteria	40	43.95	1758.00
	Criteria	40	37.05	1482.00
	Total	80		
Knowledge of the rating	No criteria	40	37.05	1482.00
	Criteria	40	43.95	1758.00
	Total	80		

Test Statistics[a]

	Perception of how the touch felt	Knowledge of the rating
Mann-Whitney U	662.000	662.000
Wilcoxon W	1482.000	1482.000
Z	-1.349	-1.349
Asymp. Sig. (2-tailed)	.177	.177

a. Grouping Variable: Criteria

Appendix 14 – Cross-tabulation analysis between preferred pillow and congruence/ incongruence conditions and Chi-Square Test

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preferred Pillow * Congruency	76	100.0%	0	.0%	76	100.0%

Preferred Pillow * Congruency Crosstabulation

			Congruency		Total
			Incongruent	Congruent	
Preferred Pillow	A	Count	8	13	21
		% within Congruency	20.5%	35.1%	27.6%
	B	Count	31	24	55
		% within Congruency	79.5%	64.9%	72.4%
Total		Count	39	37	76
		% within Congruency	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.030[a]	1	.154		
Continuity Correction[b]	1.365	1	.243		
Likelihood Ratio	2.043	1	.153		
Fisher's Exact Test				.202	.121
Linear-by-Linear Association	2.003	1	.157		
N of Valid Cases[b]	76				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.22.

b. Computed only for a 2x2 table

Appendix 15 – Mann-Whitney test for the significance of the difference between the extent of preference in congruent versus incongruent information conditions

Group Statistics

	Congruency	N	Mean	Std. Deviation	Std. Error Mean
Extent of preference	Incongruent	40	2.82	5.109	.808
	Congruent	40	2.62	5.261	.832

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Extent of preference	80	2.72	5.153	-8	10
Congruency	80	.50	.503	0	1

Ranks

	Congruency	N	Mean Rank	Sum of Ranks
Extent of preference	Incongruent	40	39.92	1597.00
	Congruent	40	41.08	1643.00
	Total	80		

Test Statistics[a]

	Extent of preference
Mann-Whitney U	777.000
Wilcoxon W	1597.000
Z	-.222
Asymp. Sig. (2-tailed)	.824

a. Grouping Variable: Congruency

Appendix 16 – Mann-Whitney test for the significance of the difference between the extent of preference in criteria versus non criteria conditions (within the incongruent condition)

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Extent of preference	No criteria / Incongruent	20	3.35	4.815	1.077
	Criteria / Incongruent	20	2.30	5.459	1.221

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Extent of preference	40	2.82	5.109	-8	9
Criteria	40	.50	.506	0	1

Ranks

	Criteria	N	Mean Rank	Sum of Ranks
Extent of preference	No criteria	20	21.60	432.00
	Criteria	20	19.40	388.00
	Total	40		

Test Statistics[b]

	Extent of preference
Mann-Whitney U	178.000
Wilcoxon W	388.000
Z	-.599
Asymp. Sig. (2-tailed)	.549
Exact Sig. [2*(1-tailed Sig.)]	.565[a]

a. Not corrected for ties.

b. Grouping Variable: Criteria

Appendix 17 – Descriptives of Importance attributed to touch by the participants

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
3.a) É muito importante para mim tocar uma almofada antes de a comprar.	80	0	5	4.46	.993
3.b) Eu nunca consideraria comprar uma almofada sem primeiro a tocar.	80	-4	5	3.81	2.032
Valid N (listwise)	80				

Frequencies - 3.a) ‘‘É muito importante para mim tocar uma almofada antes de a comprar.”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I don't agree nor disagree	2	2.5	2.5	2.5
	3	9	11.2	11.2	13.8
	4	15	18.8	18.8	32.5
	I strongly agree	54	67.5	67.5	100.0
	Total	80	100.0	100.0	

Frequencies - 3.b) “Eu nunca consideraria comprar uma almofada sem primeiro a tocar.”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-4	2	2.5	2.5	2.5
	-3	1	1.2	1.2	3.8
	1	1	1.2	1.2	5.0
	I don't agree nor Disagree	3	3.8	3.8	8.8
	1	1	1.2	1.2	10.0
	2	4	5.0	5.0	15.0
	3	9	11.2	11.2	26.2
	4	14	17.5	17.5	43.8
	I strongly agree	45	56.2	56.2	100.0
	Total	80	100.0	100.0	