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The association between need for touch and desire for unique products and consumer (inter) dependent problem-solving

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RESUMO

A relação entre necessidade de toque e desejo por produtos únicos e solução de problema (inter) dependente do consumidor

Algumas pessoas podem não comprar produtos sem os tocar em primeiro lugar, acreditando que isso poderia gerar mais garantia de informações e reduzir a incerteza da compra. A literatura sugere um instrumento para medir a experiência de toque, chamado Necessidade de Toque. Neste trabalho, tem-se por objetivo analisar se a necessidade de toque é empiricamente consistente. Com base em revisão de literatura, hipóteses de pesquisa são sugeridas a fim de avaliar a validade nomológica, convergente e discriminante do fenômeno. A partir delas, quatro suposições foram suportadas na direção esperada. Necessidade de toque foi associada com dependência e interdependência na tomada de decisão. Necessidade de toque não foi associada com desejo de consumir produtos únicos. Os resultados mostraram o construto como bi-dimensional. O efeito moderador foi também encontrado. Isso significa que quando o consumidor tem maior (vs. inferior) necessidade de toque, a motivação para fazer compras experimentais desempenha um papel mais (vs. menos) importante sobre a motivação impulsiva.

***Palavras-chave*:** necessidade, toque, produtos, único, dependência.

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1. INTRODUCTION

Consumers' behavior and decision-making process suggests that individuals decide to buy products based on different criteria, such as brand name, relevant attributes, perceived quality, convenience, and price. One means of

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assessment is touching the products. Touching is a way of obtaining information, since the tactile sense helps consumer decision making by providing sensory forms of pertinent information. For instance, individuals' confidence in a product may differ depending on whether a shopper has the opportunity to touch and examine it. In addition, a shopper's attitude toward a product may be more positive if they have the opportunity to touch it and experience pleasurable sensory feedback before purchase (for example by rubbing a soft leather coat; PECK and CHILDERS, 2003). The touch process influences the purchase decision by providing the consumer with better certainty about and familiarity with the product.

Peck and Childers (2003, p.430) comment on the possibility of evaluating details, saying that

> "[some] consumers touch products to simply place them in shopping carts, other consumers spend more time exploring products with their hands before ultimately making a purchase decision. [Thus, it] seems likely that some individuals would prefer information available through the sense of touch",

rather than information obtained through reading technical labels or listening to friends' opinions.

The literature suggests that information available through the sense of touch is called **haptic** information. For Klatzky and Lederman (1992; 1993) and Lederman and Klatzky (1987), touching with the hands, or activating the haptic system, has been reported to be particularly important in encoding the object's material properties corresponding to texture, hardness, temperature, and weight.

Based on the necessity of a more efficient decision-making process, product touching could help to explain why individuals gained more confidence, attitude, assurance, and greater ability to make their selection. To facilitate this, retailing strategies could be developed in order to facilitate consumers' touch. To begin with, marketing professionals and consumer analysts need to measure the necessity for touching. Since research on the need for touch has either developed or validated scales or instruments, or used the scales from previous studies without any change, their cross-cultural generalizability requires further research. Consequently, this study deals with the recommended methodology for testing the cross-cultural generalizability of the Need For Touch (NFT) scale. We devised three studies analyzing the NFT scale, and structured the paper as follows: in the next part, a literature review defines the Need For Touch construct and its dimensions. Subsequently, we propose some hypotheses about the nomological structure. Next, we present studies in which we analyze the sense of touch. **Study 1**, which is a survey, supports many of the hypotheses formulated using structural equation modeling, contributing to the international literature on the topic. **Study 2**, in which we manipulated the sense of touch in an experimental condition, does not support the hypothesis that touching increases consumer behavioral intention, but sustains the moderating role of touch × gender over marketing variables, such as satisfaction and purchase intent. **Study 3**, which is a survey, supports the NFT structure and shows new associations with the need for unique products and interdependent and dependent consumer decisions.

2. NEED FOR TOUCH THEORY

Peck and Childers (2003, p.431) defined Need for Touch (NFT) "as a preference for the extraction and utilization of information obtained through the haptic system". It means that by using the haptic system, consumers can obtain product information and use it to make better judgments. The NFT construct is based on motivational vs. ability differences among individuals (JOHANSSON, 1978).

According to Peck and Childers (2003), a further distinction can be made with regard to the type of haptic information extracted from products. For Holbrook and Hirschman (1982), one type, instrumental information, is more intrinsic to the product and more detailed to the goal-directed evaluation of a product's performance or its purchase. The instrumental properties are related less to the sensory enjoyment of the product than to its structural properties (PECK and CHILDERS, 2005). In disparity, autotelic forms of information are related to the sensory experience and hedonic appreciation of the product (HOLBROOK and HIRSCHMAN, 1982).

The need to examine products haptically can be driven by intrinsic motivations: some consumer are problem solvers, while others seek fun, fantasy, arousal, sensory stimulation, and enjoyment (PECK and WIGGINS, 2006). The dichotomy of motivational vs. capability has been represented in the international retail context by the themes of shopping as work vs. the festive perspective of shopping, as a fun activity (PECK and CHILDERS, 2003). In fact, the dual characterization of NFT from both the retail as well as the psychological literature on motivations is consistent with the perspective of NFT as a multi-dimensional construct with two primary factors. They are defined as instrumental and autotelic touch, or ability/work goals, vs. motivational/fun. We explain each one next.

- **The NFT instrumental factor**
  The instrumental dimension represents those aspects of pre-purchase touch that reflect outcome-directed touch with a salient purchase goal (PECK and CHILDERS, 2003). In this factor, consumers touch the products seeking to fill a gap, either by obtaining more information from the product or by analyzing its physical structure. Contained within the domain of this form of touch are goal-driven evaluative outcomes related to the consumer (e.g. eliminating doubt), as well as to the target product (e.g. evaluating quality, durability). An example of an instrumentally driven haptic product evaluation (PECK and CHILDERS, 2003) is pick-

ing up a notebook computer and holding it in one's hand to assess its weight, texture, hardness, properties, and to derive an inference with respect to its portability.

- **The NFT autotelic factor**
  The autotelic touch dimension corresponds to the sensory aspect of product touch, with no purchase goal necessarily salient, but with spontaneous investigation of multisensory psychophysical product relationships (HOLBROOK and HIRSCHMAN, 1982). Peck and Childers (2003) suggest that central to defining the domain of autotelic touch are the hedonic and compulsive need to engage in exploratory variety seeking. For example, consumers may comprehend hedonics as affecting fun, arousal and sensory stimulation, and the compulsive as a lack of control and indiscriminate processing. Some evidence for appreciating the experiential aspect of consumer behavior is found in museums that offer multisensory environments, including music and hands-on displays of sculpture which allow individuals to touch and interact with objects (FIORE, MORENO, and KIMBLE, 1996). The autotelic dimension of NFT relates to touch as an end in and of itself (PECK and CHILDERS, 2003).

2.1. Need for touch: international validity

Acoording to Sood (1990), few studies have mentioned the question of measurement equivalency in international market research, and none of the previous research has determined if this is indeed a problem across a variety of languages. The literature emphasizes that constructs and concepts may involve culture-specific attributes and meanings, which need to be clearly taken into account to guarantee the correct interpretation of cross-cultural data (PENG, PETERSON, and SHYI, 1991). In a comparable vein, there is proof that the language of the questionnaire affects the way respondents answer the same question, which argues against the use of single-language surveying (HARZING and MAZNEVSKI, 2002).

Surprisingly, there has been little research on the topic of Etic versus Emic scales and the problem of cultural impact on the meaning and scaling of constructs (HERCHE, SWENSON, and VERBEKE, 1996). Emic scales, those which are culture bound, if used in inappropriate research venues result in research which is neither valid nor reliable in any sense.

The NFT scale has been used in many English studies. Peck and Childers (2003) proposed the Need For Touch scale, and many studies have since used the scale without validity (WORKMAN, 2009; JANSSON-BOYD, 2011a, 2011b; KRISHNA, 2011; PECK and JOHNSON, 2011; SHU and PECK, 2011; SPENCE and GALLACE, 2011).

Peck e Wiggins (2006) investigated the persuasive influence of touch as an affective tool in the absence of useful product-related information. The authors find that for people who are motivated to touch because it is fun or interesting, a communication that incorporates touch leads to increased affective response and increased persuasion, particularly when the touch provides neutral or positive sensory feedback. People who are not motivated to touch for fun will also be persuaded by a communication that incorporates touch when they are able to make sense of how the touch is related to the message. The authors explore the effectiveness of different types of touch in generating an affective response, and they replicate the effects on attitudes and behavior in a real-world setting.

According to Meng, Elliott, and Hall (2009), the generalizability of measurements of international instruments across different cultures is becoming more important as marketers increasingly engage in cross-cultural research. It is essential to assess whether instruments used to measure relevant constructs in one culture can also be applied to others before any cultural comparisons can be made.

3. HYPOTHESES

3.1. Convergent validity

Citrin *et al.* (2003, p.918) developed a six-item scale to measure Need for Tactile Input (NTI), defining it as "the desire or need for tactile input to make brand/product evaluations". First, Peck and Childers (2003) believe that NTI's domain overlaps with the instrumental dimension of the NFT scale, because most of the items in the NTI are very similar with those in NFT. For example, "I need to touch a product in order to create a general evaluation of it" (NFI) vs. "I feel more confident making a purchase after touching a product" (NFT). Second, since the instrumental dimension of the NFT scale refers to those aspects of pre-purchase touch that reflect outcome-directed touch with a salient purchase goal, and since NTI represents a tactile way of making brand/product judgments, it is assumed that these two constructs are positively associated and converge with each other. We suppose that they are related.

H_1 – The NTI scale has a positive relation with the instrumental dimension of NFT.

3.2. Discriminant validity

Peck and Childers (2003, p.434) comment that "although Need for Cognition, (NFC), similar to NFT, overlaps the domain of information-acquisition behavior, NFC taps this domain at a more macro level that is also not specific to the consumption context". We assume that the NFC scale does not incorporate the need for consumption (PAN, KIM, and VANHONACKER, 1995). For instance, the need for cognition might be met by the eventual reasoning of reading a newspaper or interpreting a movie. The cognition aspect of the NFC does not require a specific purchase moment, dispensing with the necessity of touch. In contrast, the NFT scale is more molecular

in terms of its sense-specific focus and narrower in tapping consumption behavior. Thus, we suppose that both scales are not related. Therefore:

H_2 – NFC scale has no relation with NFT.

Peck and Childers (2003) argue that Need To Evaluate (NTE) represents information acquisition, but in the context of chronic evaluation. This chronic form of evaluation across the board is in contrast to the product-specific nature of NFT, which is more peculiar to goods. In fact, evaluation relates to overall objects, while Need For Touch is dedicated to products. Thus, evaluation represents only one aspect of NFT, particularly when ther instrumental dimension is contrasted with autotelic touch. NTE represents a more global necessity of assessing things while NFT is more specific to the decision making process. Based on this argument, we hope that both constructs are not associated and are different. Then:

H_3 – NTE scale has no relation with NFT.

3.3. Nomological validity

As evidence of nomological validity, we consider three direct-marketing media variables, such as shopping via catalog/mail, via telephone, and via Internet. Klatzky, Lederman, and Matula (1993) evidenced a visual preview model in which vision constitutes a quick glance which results in broad but coarse information about the haptic properties of an object, information that is useful in directing further processing. Consequently, viewing a catalog or a web page may reveal that more detailed information about a haptic property is available because it is written, yet not readily attainable. Supposedly, a consumer who values haptic information would be expected to be less likely to purchase products via direct-marketing channels, because direct product touching is unavailable (PECK and CHILDERS, 2003). We believe that consumers might be averse to non-touch media, thus having a negative association. Hence:

H_{4a} – Purchasing via non-touch media has a significant negative relation with the instrumental dimension of NFT (i.e. goal-oriented factor).

First, when consumers purchase via direct media, it is more likely that they are engaged in shopping behavior with a salient purchase goal rather than for fun (PECK and CHILDERS, 2003). Thus, it is more difficult to find fun through e-retail than in a shopping mall. Second, a prominent goal could be saving time or finding a better price by comparing stores. Nevertheless, autotelic touch is concerned with touch **without** a guiding purchase aim, which is not associated with the assumption that consumers purchase via these direct media with a salient goal. For this reason, we suppose that:

H_{4b} – Purchasing via non-touch media has no relation with autotelic NFT.

The experiential motivation for shopping as a latent construct that represents social or recreational motivations rather than purchasing products as obligation (DAWSON, BLOCH and RIDGWAY, 1990). They suggest that the experience of buying is driven more by the desire for fun than by the necessity of acquiring information to purchase a product (goal setting orientation). The autotelic touch dimension corresponds to the sensory aspect of product touch with no purchase goal necessarily salient, but with spontaneous investigation of multisensory psychophysical product relationships. This dimension is expected to be associated with the experimental dimension, since that dimension does not necessarily have a salient purchase goal. In this context, it is expected that:

H_{5a} – Experiential shopping is associated positively with the autotelic dimension of NFT.

Because the instrumental factor reflects outcome-directed touch with a salient purchase end, we expect that this dimension will not associate with the experiential motivation for shopping. The instrumental factor reflects utilitarian orientation (vs. hedonic orientation), and they should therefore not be related. The instrumental factor does not reflect the recreational goal for shopping. Thus:

H_{5b} – Experiential shopping has no association with instrumental NFT.

The final evidence for nomological validity is based on the arguments of Rook and Fisher (1995). They point out that

> "highly impulsive buyers are more likely to experience spontaneous buying; their shopping lists are more 'open' and receptive to sudden, unexpected buying ideas" (ROOK and FISHER, 1995, p.306).

In that sense, the impulsive purchase trait is characterized by the lack of a salient purchase goal (ZHOU and WONG, 2004), at least at the start of the shopping experience, and because of this (H_{6a}) it is supposed to be positively related to autotelic NFT, since it is more spontaneous and characterized by a non-salient purchase objective (PECK and CHILDERS, 2003). Contrarily, instrumental NFT is more reflective and concerns a salient purchase goal ($H_{6b)}$. Hence:

H_{6a} – It is expected that buying impulsiveness will be related to autotelic NFT.

H_{6b} – It is expected that buying impulsiveness will be unrelated to instrumental NFT.

4. STUDY 1

4.1. Design

Our main goal is to test the cross-cultural generalizability of the Need For Touch scale and its nomological validity. For this purpose, we used back translation to create a portuguese version of the NFT instrument, done by two academics fluent in Portuguese (MALHOTRA, 2001). Consequently, the questionnaire was pre-tested with three students. In-depth interviews were conducted with each student to identify any problems, seeking out ambiguities and misleading of the instrument. Modifications were implemented and a final version of the scale was designed. A total of 171 observations were possible, using a university business faculty as a survey site: all individuals were undergraduate business students. The sample was defined as non-probabilistic by convenience (MALHOTRA, 2001). The results are limited to our sample size. It is not possible to generalize the results, since it is a convenience sample.

4.2. Measurement

The questionnaire contained the 12-item NFT instrument from Peck and Childers (2003) that can be viewed in Appendix I; the 16-item NTE scale from Jarvis and Petty (1996); the 18-item NFC instrument from Cacioppo and Petty (1982) and Pan, Kim, and Vanhonacker (1995); the 5-item NTI instrument from Citrin *et al.* (2003); the 3-item instrument for measuring non-touch buying styles from Peck and Childers (2003), such as tendency to buy by catalog, by telephone, and by Internet; the 6-item measure of Impulsive behavior from Rook and Fisher (1995) and a 5-item Experiential Shopping instrument from Dawson, Bloch, and Ridgway (1990). All scales were managed according to the Likert 7-point style; varying from strongly disagree to strongly agree.

4.3. Constructing conceptual definitions

Based on the theoretical review, the Need For Touch construct is the preferred means of the extracting and using information obtained through the haptic system (PECK and CHILDERS, 2003). Need To Evaluate is the assessment of the positive and/or negative qualities of an object (JARVIS and PETTY, 1996). Need for Tactile Input examines the role of tactility in making product choices on the Internet (CITRIN *et al.*, 2003). Need For Cognition is the necessity of extracting the best reasoning in the decision-making process (CACIOPPO and PETTY, 1982). Impulsive Buying Behavior is the consumer's tendency to buy spontaneously, unreflectively, immediately, and kinetically (ROOK and FISHER, 1995). Experiential Shopping relates to social or recreational motivations of buying rather than to purchase products out of obligation (DAWSON, BLOCH and RIDGWAY, 1990; SIN and TSE, 2002).

4.4. Results

Initially, all variables were analyzed in terms of missing values (observation and variable), univariate and multivariate outliers, multicollinearity, skewness and kurtosis, and normality. Although ten observations were excluded because of missing values, most fell within the boundaries suggested by Hair *et al.* (1998) and Kline (1998). We used exploratory factor analysis in analyzing the NFT structure. Criteria used for retaining variables were factor loading and communalities both above 0.45, and eigenvalues over one. The extraction method chosen was non-orthogonal (oblimin). We used this procedure because: the factors are supposed to be correlated in social science, oblique rotations will always meet the simple structure criterion better than orthogonal rotations, and some research supports a slight superiority of oblique rotations in terms of international factor replicability (REISE, WALLER, and COMREY, 2000).

4.1.1. International dimensionality

The first exploratory factor analysis showed three dimensions for the NFC scale (Kaiser-Meyer-Olkin = 0.88; $p <$ 0.000). This structure presented the first dimension as autotelic, the second dimension as instrumental, and the third dimension also as instrumental (variance explained at 46%, 12%, and 8% respectively). The three-dimensional structure is also different from the original two-dimensional model.

It is important to note that there are some limitations to this first exploratory factor analysis. First, some authors have suggested that using eigenvalues over one as the criterion for determining the number of components to retain is problematic, since this method is 20% correct when compared to scree plot, parallel analysis, χ^2-Bartlett, and MAP (ZWICK and VELICER, 1986). Based on this limitation, Zwick and Velicer (1986), in their Monte Carlo simulation, discovered that the best procedure for finding the number of components is using parallel analysis, since it is correct in 80% percent of the cases vs. 20% using eigenvalues over 1. According to Zoski and Jurs (1996, p.444),

> "[if] parallel analysis compares the eigenvalues of the correlation matrix to those of a matrix of randomly generated variables, the eigenvalues from the research data should be greater than those from the random data".

Second, the three variables scored below 0.45 in commonality, indicated as a minimum value by Clark and Watson (1995). According to Floyd and Widaman (1995, 290), commonality of a "variable is the variance that variable shares with the latent variables underlying the set of observable measures". A result under 0.45 means that the item either is not related to the other items, or suggests an additional factor that should be explored

(COSTELLO and OSBORNE, 2005). The commonalities values were NFT 1, $h^2 = 0.33$; NFT 2, $h^2 = 0.34$; and NFT 6, $h^2 = 0.44$. Thus, the variables that did not achieve the minimum were excluded and a second factor analysis was done. The RanEingen Syntax program was used to determine the number of random eigenvalues in this analysis (ENZMANN, 1997). Eigenvalues from the research data (5.5; 1.5; and 1.05), when compared to random data (1.47; 1.34; and 1.24), showed that the ideal dimensions should be just two dimensions of the NFT scale, which matches the result suggested by the literature (PECK and CHILDERS, 2003).

The results perfectly represent the international dichotomy view of the utilitarian focus (consumers are concerned with purchasing products in an efficient and timely manner to achieve their goals with a minimum of irritation) and the adventure focus, which reflects the potential entertainment value of shopping and the enjoyment of any pre-specified end goal (PECK and CHILDERS, 2003). Table 1 presents the results. The variance explained was 51% in the first dimension and 16% in the second (67% total). Streiner (1994) suggests that factors should explain at least 50% of the total variance. Again using parallel analysis, this second exploratory factor analysis showed that eigenvalues from the research data (4.57 and 1.48), when compared to random data (1.37 and 1.25), perfectly present two dimensions of the NFT scale. In Table 1, we present the factor loading from the exploratory and confirmatory factor analyses.

The 4-item autotelic scale has a coefficient α of 0.85, while the 5-item instrumental scale has a coefficient α of 0.83. These two alpha coefficients are above ≥ 0.80 (NUNNALLY, 1978), and each construct has more than three variables (COSTELLO and OSBORNE, 2005). Other reliability indicators also indicate the scales' soundness. For example, according to average variance extracted (AVE), the 4-item autotelic scale has a value of 0.59 and the instrumental has a value of 0.53 (composite reliability (CR) for autotelic = 0.85 and instrumental = 0.84, FORNELL and LARCKER, 1981).

4.4.2. Scale structure

The next step was to assess scale structure, using confirmatory factor analysis. Concurrent models using the variance covariance matrix were estimated with AMOS (BYRNE, 2001). We analyzed competing measurement models, and the results are shown in Table 2. Model A has two factors with correlation fixed at zero. Model B is the same as Model A, however the correlation is free. Model C is a unidimensional construct. Model D is a higher order construct with two factors. Model E is the three-factor model found by AFE. Model F is the three-factor model without association, and model G is a higher-order construct. Table 2 presents the concurrent models tested and the structural equation adjustments.

The results indicate that the model B had an association of $r = 0.67$ between the variables ($p < 0.001$; $r^2 = 0.45$). This result is similar to the one found by Peck and Childers (2003) in their study ($r = 0.64$; $p < 0.001$). However, the problem is that the structural indexes are poor. For instance, AGFI, GFI, and NFI

Table 1

Confirmatory Factor Analyses of NFT

Variables	Study 1 (N = 171)				Study 2 (N = 41)		Study 3 (N = 77)	
	EFA		CFA		CFA		CFA	
	1	2	1	2	1	2	1	2
NFT 9 A	0.78	0.31	0.80		0.88		0.83	
NFT 7 A	0.73	0.35	0.77		0.78		0.82	
NFT 5 A	0.71	0.22	0.72		0.70		0.68	
NFT 12 A	0.79	0.36	0.78		0.62		0.79	
NFT 1 A					0.65		0.68	
NFT 4 I	0.28	0.81		0.66		0.79		0.79
NFT 3 I	0.40	0.80		0.71		0.81		0.85
NFT 6 I						0.74		0.68
NFT 8 I	0.58	0.78		0.85		0.81		0.89
NFT 10 I	0.67	0.46		0.67		0.58		0.66
NFT 11 I	0.65	0.51		0.67		0.61		0.67

Note: EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; Study 1 Varimax Rotation (PCA); Study 2 x2/d.f. = 2.74; Study 3 x2/d.f. = 2.97; I = Instrumental; A = Autotelic; N = Sample Size.

Table 2

Structural Equation Model Fits (Study 1)

Model	χ^2/d.f.	*p-value*	AGFI	GFI	NFI	RMSEA
A. Two factor without correlation	6.98	0.000	0.67	0.80	0.75	0.19
B. Two factor with correlation	4.96	0.000	0.71	0.83	0.83	0.16
C. One general factor	7.79	0.000	0.58	0.58	0.72	0.20
D. Second order two factors	4.96	0.000	0.71	0.83	0.83	0.16
E. Three factors with correlation	2.33	0.000	0.82	0.88	0.87	0.09
F. Three factors without correlation	4.79	0.000	0.70	0.79	0.73	0.15
G. Second order three factors	2.33	0.000	0.82	0.88	0.87	0.09

Note: Estimative Maximum Likelihood; X^2 Qui-Squared by Degree of Freedom; *p-value* = Significance Level; AGFI = Adjusted Goodness Fit Index; GFI = Goodness Fit Index; NFI = Normed Fit Index; RMSEA = Root Mean Squared Error Approximation.

are all under 0.90, and RMSEA is above 0.08 (McDONALD and HO, 2002). This indicates that the theoretical model does not fit well with the real data. Hox and Bechger (1998, p.9) explain that "perfect fit may be too much to ask for; instead, the problem is to assess how well a given model approximates the true model".

4.4.3. Convergent validity

The H_1 states that NTI scale has a higher relationship with the instrumental dimension of NFT vs. the autotelic dimension of NFT. A structural model was built to test this hypothesis. Initially, the model fits are χ^2/d.f. = 3.19; *p*-value = 0.000; AGFI = 0.75; GFI = 0.82; NFI = 0.83 and RMSEA = 0.11. The structural adjustment is not so good; however, it is important to reiterate that the main goal here is to verify the association of the variables, and not just the structural model fits. The 5-item NTI scale ($\alpha = 0.89$) is related positively to instrumental ($\beta = 0.77$; $p < 0.001$; $r = 0.75$; $p < 0.001$) and autotelic dimensions ($\beta = 0.63$; $p < 0.001$; $r = 0.65$; $p < 0.001$), where the instrumental factor is higher in beta value than autotelic. These consequences support H_1.

The results suggest that the desire or need for tactile input has a strong impact on those aspects of pre-purchase touch that reflect outcome-directed touch with a salient purchase goal – instrumental NFT. The evidences suggest that NFT converges with NTI phenomena.

4.4.4. Discriminant validity

The second hypothesis declares that the 18-item NFC scale does not have a significant association with either the instrumental dimension of NFT or the autotelic dimension of NFT. First, an exploratory factor analysis showed problems with the NFC dimensionality. It suggested five dimensions to a scale that is unidimensional (Kaiser-Meyer-Olkin = 0.71; $p < 0.000$). Because of this problem, we decided to fix the number of factors at one, instead of using the eigenvalue over one (Kaiser-Meyer-Olkin = 0.70; $p < 0.000$). Thus, four variables were retained ($\alpha = 0.71$), and these were used to represent the NFC latent construct. The structural model fits for the second hypothesis are χ^2/d.f. = 2.53; *p*-value = 0.000; AGFI = 0.78; GFI = 0.83; NFI = 0.72; and RMSEA = 0.10. The reduced NFC scale, as predicted, is neither related to instrumental ($\beta = 0.14$; p=NS; $r = 0.17$; p=NS) nor autotelic ($\beta = 0.19$; p=NS; $r = 0.10$; p=NS), supporting H_2. Here, the result indicates that although both NFT and NFC overlap in the domain of information-acquisition behavior, they are discriminated.

Next, H_3 states that the 16-item NTE instrument does not have a significant association with either the instrumental or the autotelic dimension of NFT. Originally, the exploratory factor analysis showed an issue with the NTE dimensionality, and recommended five dimensions to an instrument that is theoretically created in one factor (Kaiser-Meyer-Olkin = 0.70; $p < 0.000$). Because of this problem, it was decided to fix the number of factors at one (Kaiser-Meyer-Olkin = 0.70; $p < 0.000$), rather than use the eigenvalue over one. Thus, four items are retained ($\alpha = 0.71$) and these indicators are used to test the premise. Structural model fits (χ^2/d.f. = 3.57; *p*-value = 0.000; AGFI = 0.75; GFI = 0.83; NFI = 0.77; and RMSEA = 0.13) show that the 4-item NTE scale is related positively not only to the instrumental ($\beta = 0.44$; $p < 0.000$; $r = 0.39$; $p < 0.01$), but also to the autotelic ($\beta = 0.22$; $p < 0.03$; $r = 0.10$; p=NS). The results do not support H_3.

4.4.5. Possible explanation of the H_3 result

Peck and Childers (2003) hypothesized that Need To Evaluate represents information acquisition, but in the context of chronic evaluation, and that Need for Touch does not take place in the context of persistent appraisal. These differences

discriminate both constructs. The empirical evidence indicates that both NTE and NFT represent information acquisition, since they are positively associated, but that NFT is more focused on information acquisition for evaluation, since some association exists. Specifically, the empirical evidence shows that NTE is positively associated with the instrumental dimension of NFT, which reflects information acquisition for decision making. We hypothesized that NFT's instrumental dimension represents the subconscious aspect of touching with a goal of evaluating the products for making better judgments. Thus, the construct is not only towards a goal pre-elaborated by consumer, but also part of an an evaluation process. It may be because these two constructs have similar aspects: chronic evaluation. It is subconscious because NFT and NFC did not associate. Peck and Childers (2003, p.434) comment that "evaluation represents only one aspect of the NFT, particularly when instrumental is contrasted with autotelic touch".

4.4.6. Nomological validity

The next hypotheses, H_{4a} and H_{4b}, assume that a consumer who values haptic information would be expected to be less likely to purchase products via direct marketing channels that prevent product touching. Thus, catalogs, telephone, and the Internet are ways that consumers might buy products without touching them. These three variables were regressed against autotelic and instrumental dimensions. The structural model fits are χ^2/d.f. = 6.29; *p*-value = 0.000; AGFI = 0.62; GFI = 0.75; NFI = 0.63; and RMSEA = 0.18. The results can be viewed in Table 3. Hypothesis H_{4a} is not supported since all associations are non-significant. Nevertheless, supposition H_{4b} is supported, because all associations of the autotelic are non-significant, as predicted.

Table 3

Results of H_{4a} and H_{4b}

Exogenous Variables	Endogenous Variables	
	Autotelic – H_{4b}	Instrumental – H_{4a}
Catalog	β = 0.05; *p*=NS	β = 0.11; *p*=NS
Telephone	β = 0.13; *p*=NS	β = 0.05; *p*=NS
Internet	β = -0.02; *p*=NS	β = -0.11; *p*=NS

Experiential buying behavior is the next construct analyzed. Just one dimension from Dawson, Bloch and Ridgway's (1990) scale was selected. The exploratory factor analysis showed that all variables loaded in just one dimension, in keeping with the literature (Kaiser-Meyer-Olkin = 0.79; $p < 0.000$). The structural model fits are χ^2/d.f. = 3.55; *p*-value = 0.000; AGFI = 0.75; GFI = 0.82; NFI = 0.76; and RMSEA = 0.13. The 5-item scale has coefficient α of 0.84, is not related to instrumental dimension ($\beta = 0.15$; *p*=NS; $r = 0.14$; *p*=NS), and is positively associated to the autotelic factor ($\beta = 0.19$; $p < 0.05$; $r = 0.18$; $p < 0.05$). These two results support both H_{5a} and H_{5b}.

The last assumption stated that the impulsive scale does not have a significant relation with the instrumental dimension of NFT (H_{6b}), but a positive and significant one with the autotelic (H_{6a}). An exploratory factor analysis showed that the impulsive instrument was loaded with just one factor (Kaiser-Meyer-Olkin = 0.84; $p < 0.000$). The structural model fits are χ^2/d.f. = 3.40; *p*-value = 0.000; AGFI = 0.75; GFI = 0.81; NFI = 0.76; and RMSEA = 0.12. The 6-item impulsive scale has a coefficient α of 0.85, is not related to the instrumental ($\beta = 0.12$; *p*=NS; $r = 0.11$; *p*=NS), and is positively associated with the autotelic ($\beta = 0.20$; $p < 0.05$; $r = 0.19$; $p < 0.05$). These outcomes support both hypotheses H_{6a} and H_{6b}.

The correlation matrix is showed in Table 4. Some results deserve to be highlighted at a first glance. Initially, the NTE did not associate with autotelic NFT, although the regression model showed a significant result ($\beta = 0.22$; $p < 0.03$). Second, the NFC scale did not associate with the NFT, as predicted by the literature and supported by the tests. Impulsive behavior showed a positive association with the NFC ($r = 0.24$; $p < 0.05$) and with experiential conduct ($r = 0.60$; $p < 0.001$). First, this result suggests that even though the individual is buying through momentum or impulse, she/he needs to use cognition to decide. Second, since experiential conduct relates to social or recreational motivations, rather than to purchase products or shopping for the sake of the experience (PECK and CHILDERS, 2003), it is related to impulse buying, which is not organized buying. These associations indicate that telephone and Internet shopping are buying systems prompted by leisure, used as entertainment.

4.5. Moderating effects of NFT

The moderating effects of NFT and NFC were tested by multigroup analysis with structural equation modeling (SAUER and DICK, 1993). The full sample was divided in two groups using a median split of the NFT autotelic scale, which is a common procedure suggested by the literature (BELL and LUDDINGTON, 2006; EVANSCHITZKY and WUNDERLICH, 2006).

4.5.1. Pre-conditions for moderating test

Baron and Kenny (1986, p.1174) comment that "it is desirable that the moderator variable be uncorrelated with both the predictor and the criterion to provide a clearly interpretable interaction term". This criterion is partially fulfilled in the first moderating test. See, for instance, experiential *vs.* autotelic ($r = 0.18$; *p*=NS); impulsive *vs.* autotelic ($r = 0.19$; $p < 0.05$); and NFC *vs.* NTI ($r = 0.11$; *p*=NS). It is totally accomplished

Table 4

Correlation Matrix of the Constructs (Study 1)

Variables	1	2	3	4	5	6	7	8	9
1. Instrumental NFT	[0.53]								
2. Autotelic NFT	0.67***	[0.59]							
3. NFC	0.17	0.10	[0.51]						
4. NTE	0.39**	0.13	0.02	[0.39]					
5. Experiential	0.14	0.18*	0.19*	0.03	[0.51]				
6. Impulsive	0.11	0.19*	0.24*	-0.07	0.60***	[0.50]			
7. Catalog	0.09	0.12	0.10	-0.06	0.14	0.19*	1[n.a.]		
8. Phone	0.06	0.16	0.25*	0.02	0.43***	0.34**	0.53***	[n.a.]	
9. NTI	0.75***	0.65***	0.11*	0.27	0.16	0.13	0.11	0.07	[0.62]
10. Internet	-0.03	0.07	0.16	-0.10	0.41***	0.41***	0.43***	0.50***	0.02

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; Between brackets are AVE; n.a. = not available.

in the second moderating test: see NFC *vs.* autotelic ($r = 0.17$; p=NS); NFC *vs.* instrumental ($r = 0.10$; p=NS); and NFC *vs.* NTI ($r = 0.11$; p=NS).

4.5.2. Hypothesis seven

Dawson, Bloch, and Ridgway (1990) propose that the experiential motivation for shopping is related to social or leisure motivations. On the other hand, Rook and Fisher (1995) highlight that highly impulsive buyers are more likely to experience spontaneous buying. We thus suppose that since the consumer is out shopping for recreational reasons, out of a desire for fun and relaxation, some spontaneous buying behavior could occur. It is because the individuals are more "open" and receptive to unexpected buying in that moment. Consequently, given that the autotelic NFT is not guided by a pre-existing purchase goal, it could moderate the association between the experiential motivation for shopping and the impulsive motivation. For instance, the experiential motivation for shopping should be associated with impulsive motivation, and that relation should be stronger when there is a greater level of need for touch. Hence:

H_7 – If the consumer has a higher (lower) NFT autotelic tendency; the experiential motivation for shopping would play a more (less) important role in impulsive motivation.

4.5.3. Results

Initially, the result of the association between experiential motivation and impulsive buying behavior is supported, according to our expectations ($\beta = 0.59$; $p < 0.000$; $R^2 = 0.35$). The effect of experience on impulsive buying behavior is different across high autotelic (i.e. high enjoyment) vs. low autotelic (i.e. less fun and arousal). The ΔX^2 value is = 47.35 (Δd.f. = 1, $p < 0.001$). A positive influence exists in both groups, but this relationship is stronger for the high autotelic when compared to the low autotelic, as expected ($\beta_{\text{high autotelic}} = 0.61$; $p < 0.01$; n = 75 vs. $\beta_{\text{low autotelic}} = 0.50$; $p < 0.01$).

4.5.4. Hypothesis eight

The next assumption assumes that NFC moderates the relationship between NFT and NTI. Given that the association between these two constructs was presented in the literature review, it is not explained (see details on H_1). Hence, the hypothesis explicitly states that if the consumer has a higher NFC (vs. low NFC), the instrumental NFT dimension will play a more (vs. less) important role in predicting NTI, since the instrumental factor represents outcome-directed touch with a salient purchase goal, and it presupposes more cognition to achieve a specific previously established outcome. On the contrary, if the consumer has a smaller (vs. higher) NFC, the autotelic NFT will play a more (vs. less) important role in predicting NTI, since the autotelic factor corresponds with no necessarily salient purchase aim. Thus, the autotelic factor could not demand more severe thinking or information processing from the individual (vs. the instrumental). Hence:

H_{8a} – The higher score on NFC (vs. lower NFC) creates the greatest association with the instrumental NFT dimension on NTI.

H_{8b} – The smaller score on NFC (vs. lower NFC) creates the greatest association with the autotelic NFT (vs. instrumental) dimension on NTI.

4.5.5. Results

According to the results, the effects of the autotelic NFT ($\beta = 0.26$; $p < 0.000$) and instrumental NFT ($\beta = 0.58$; $p < 0.001$) on NFI are significant. These two dichotomous constructs have different effects on NFI not only across high autotelic vs. low autotelic levels, but also across high instrumental vs. low instrumental levels. The two models show significance between them: $\Delta X^2 = 33.05$; d.f. $= 1$, $p < 0.001$. First, a positive influence is found for both groups, but this relationship is stronger for the high NFC ($\beta = 0.54$; $p < 0.01$; n = 77) when compared to the smaller NFC ($\beta = 0.48$; $p < 0.01$) (H_{8a}). Second, a positive influence is found for just one group (H_{8b}). Thus, this relationship is positive and significant for the low NFC ($\beta = 0.38$; $p < 0.05$; n = 78) when compared to the high NFC (p=NS). The results from the moderating effects can be viewed in Table 5.

5. STUDY 2

5.1. Design

In the second study, our main goal is to again test the cross-cultural generalizability of the Need For Touch scale and its nomological validity, and to analyze whether the sense of touch influences consumer intentions. Peck and Wiggins (2004) suggest that for products that have an instrumental touch element – for example, a sweater whose softness is a key desirable attribute – providing individuals with touch information has been shown to increase positive attitude toward the product and purchase intention. Thus, we believe that the sense of touch influences persuasion. Based on Peck and Wiggins' arguments and empirical findings, we believe that:

H_9 – The sense of touch could increase the (H_{9a}) likelihood of purchase, (H_{9b}) word of mouth, (H_{9c}) satisfaction, (H_{9d}) quality, and (H_{9e}) positive and negative emotion.

5.2. Procedure

We manipulated the sense of touch. Specifically, the first group of consumers analyzed hand soap advertising and did not touch in the product. We printed the photo on a high quality color sheet. After evaluating the products, consumers answered the questions. The second group of consumers instead touched the hand soap (they did not view the ad). They analyzed it, and afterwards answered the questions. Our main hypothesis is that through the sense of touch, consumers could increase their positive attitude. The sense of touch was manipulated between subjects. A total of 41 observations were possible ($n = 21$ consumers (51%) touched in the product). All individuals were MBA business students. The sample was defined as non-probabilistic by convenience (MALHOTRA, 2001). The results are limited to our sample size. It is not possible to generalize the results, since it is a convenience sample.

5.3. Measurement

The questionnaire contained a 12-item NFT instrument from Peck and Childers (2003) that can be viewed in Appendix I. In addition, we used an item to measure likelihood of purchase, quality, word of mouth, and satisfaction. We used two items to measure product effectiveness ($\alpha = 0.67$, $M = 6.41$), and we used a 5-item instrument to measure emotions (happiness, pleasure, security, confidence, anger). Rossiter (2002) argues that a single-item measure is sufficient if the construct is such that in the minds of raters (i.e. respondents to a survey), (1) the object of the construct is concrete and singular, meaning that it consists of one object that is easily and uniformly imagined, and (2) the attribute of the construct is concrete, again mean-

Table 5

Moderating Effects of NFT and NFC Constructs

Relation Examined		Moderator Variable	Lower Score		Higher Score	
			β	t-value	β	t-value
H_7	Experiential —> Impulsive Buying	NFT: Autotelic	0.50	2.88**	0.61	3.16**
H_{8a}	NFT Instrumental —> NTI	NFC: Cognition	0.48	2.96**	0.53	3.30***
H_{8b}	NFT Autotelic —> NTI	NFC: Cognition	0.38	2.37*	0.24	1.73

Note: Maximum Likelihood (ML) estimation was used; moderation test analyses were used with unstandardized coefficient for comparation as suggested by Kline (1998). For reading purposes standardized coefficients are presented. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

ing that it is easily and uniformly imagined. In addition to the metric scales, we use nominal variables.

The dummy scales were involvement with hand soap (high vs. low), like the product (yes vs. no), use the product (yes vs. no) and gender (male vs. female). All NFT scales were managed in the Likert 10-point style; ranging from strongly disagree to strongly agree. The other scales were managed using a 10-point semantic scale.

5.4. Results

The initial exploratory factor analysis showed three factors (74% variance explained, Oblimin rotation) for an instrument that is bidimensional. We excluded some items and conducted other factor analyses to find a better solution. According to the results, it is important to note that two NFT instrumental variables showed problems (NFT 10 and NFT 11) in Study 1 and then were excluded in Study 2, since they had high loads in both dimensions. The variable NFT 2 showed crossover load and was excluded. These initial results support a few problems with some NFT variables. In fact, some items had crossover loads, but the global aspect of the construct was supported. The exploratory factor analysis showed a high Kaiser Meyer Olkin value of 0.79 ($p< 0.000$). The total variance explained in Study 2 was 55.34% for factor 1 (eigenvalue 4.98) and 14.14% for factor 2 (eigenvalue 1.27). The 5-item autotelic scale has a coefficient α of 0.83 ($M = 6.02$, $r_{average} = 0.51$), while the 4-item instrumental scale has a coefficient α of 0.86 ($M = 7.05$, $r_{average} = 0.63$). These two alpha coefficients are according with the ≥ 0.80 suggested by Nunnally (1978).

Next, we analyzed the emotion scale. The anger variable presented problems since its load was low; it was excluded. The 4-item emotion scale was unidimensional (α of 0.74; $M = 4.65$; $r_{average} = 0.43$). The total variance explained was 64% (factor 1, eigenvalue 3.23). Table 6 presents the correlation matrix.

To test the assumption that the sense of touch could increase consumer intention, we ran a GLM multivariate. The independent variable was the sense of touch. The covariate measures were involvement with hand soap, liking the product, use of the product, and gender. The dependent variables were likelihood of purchase, word of mouth, satisfaction, emotion, NFT autotelic dimension, and NFT instrumental factor. No covariate had impact on dependent variables.

5.5. Main effects of touch and gender

The results showed that the sense of touch did not alter the likelihood of purchase ($F(1,39 = 0.97$; p = NS), $M_{touch} = 4.95$ vs. $M_{no\ touch} = 4.45$), word of mouth ($F(1,39 = 0.11$; p = NS), $M_{touch} = 3.23$ vs. $M_{no\ touch} = 3.47$), satisfaction ($F(1,39 = 0.75$; p = NS), $M_{touch} = 5.33$ vs. $M_{no\ touch} = 5.85$), emotion ($F(1,39 = 0.15$; p=NS), $M_{touch} = 4.57$ vs. $M_{no\ touch} = 4.82$), autotelic ($F(1,39 = 1.59$; p = NS), $M_{touch} = 6.36$ vs. $M_{no\ touch} = 5.67$), and instrumental ($F(1,39 = 0.91$; p = NS), $M_{touch} = 7.30$ vs. $M_{no\ touch} = 6.78$). The results showed that gender had an important effect on the autotelic ($F(1,39 = 6.41$; $p<0.01$), $M_{male} = 5.11$ vs. $M_{female} = 6.49$), and NFT ($F(1,39 = 4.95$; $p<0.03$), $M_{male} = 5.79$ vs. $M_{female} = 6.92$). These results can be viewed in Table 7.

5.6. Moderating effect of NFT

Since the moderating effect of NFT has received support in the literature (PECK and CHILDERS, 2005), we ran a GLM multivariate. We manipulated touch between subjects. We created NFT groups using the median scale ($M = 6.53$; Median

Table 6

Pearson Correlation Matrix of the Constructs (Study 2)

Variables	1	2	3	4	5	6	7	8
1. Likelihood of purchase	1							
2. WOM	0.68**	1						
3. Quality	0.42**	0.37*	1					
4. Satisfaction	0.42**	0.43**	0.71**	1				
5. Emotion	0.55**	0.44**	0.36*	0.48**	1			
6. NFT Autotelic	0.15	-0.07	-0.12	-0.04	0.14	1		
7. NFT Instrumental	0.17	-0.11	-0.14	0.06	0.26	0.67**	1	
8. NFT	0.18	-0.10	-0.14	0.01	0.22	0.91**	0.91**	1

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; NFT = Need For Touch; WOM = Word Of Mounth.

Table 7

Effects of Need for Touch and Gender on Consumer Intentions (Study 2)

Dependent Variables	Female	Male	Touch	No Touch
1. Likelihood of purchase	**5.14**	3.85	4.95	4.45
2. WOM	3.53	**3.00**	3.23	3.47
3. Quality	5.92	6.23	**5.57**	6.52
4. Satisfaction	5.37	6.00	5.33	**5.85**
5. Emotion	4.72	4.64	4.57	4.82
6. NFT	6.92	5.79	6.83	6.22
7. NFT Autotelic	6.49	5.11	6.36	5.67
8. NFT Instrumental	7.35	6.48	7.30	6.78

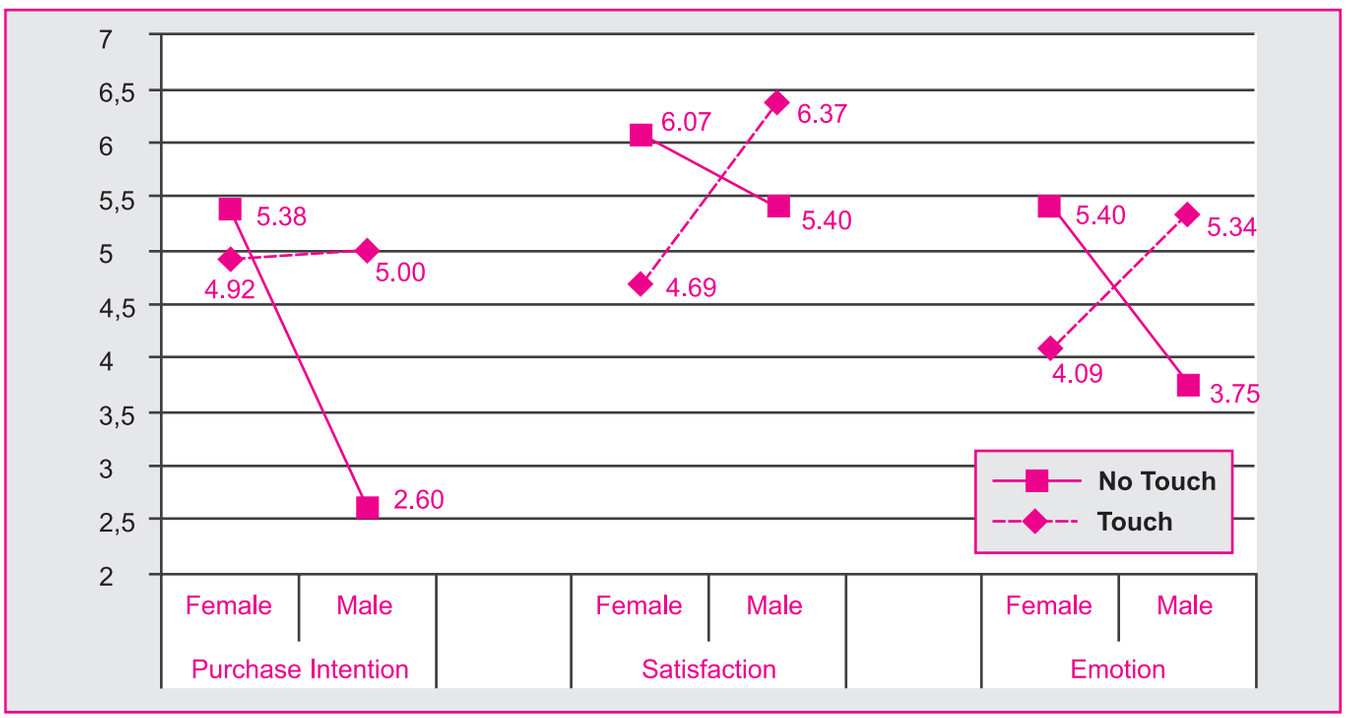
Note: 1 to 10 point scale.

= 6.72; s.d. = 1.6), and gender and involvement were dummy variables answered by the customers (high vs. low levels). Peck and Wiggins (2004) predicted that a touch-based appeal could be more persuasive than a non-touch based appeal, and that this effect could be significantly higher for those individuals who are high in NFT than for those who are low in NFT. Thus, we supposed that:

$\mathbf{H_{10}}$ – NFT plays a moderating role in the relationship between gender and consumer response.

The moderated effect of touch vs. gender was significant for likelihood of purchase ($F(1,39 = 2.80$; $p< 0.10$; $\eta_p^2 = 0.07$), satisfaction ($F(1,39 = 3.26$; $p< 0.08$; $\eta_p^2 = 0.08$), and emotion ($F(1,39 = 4.22$; $p< 0.04$; $\eta_p^2 = 0.11$). Figure 1 shows the results. The three moderating explanations follow the same direction.

These interactive results suggest that for retailers it is better to create a soap touch experience for males, (vs. for female segment), since the possibility of touch increases purchase intention. First, female consumers have greater intention to buy the product without touching it ($F(1,25 = 0.21$; $p< 0.64$; $M_{touch} = 4.92$ vs. $M_{no\ touch} = 5.38$); however, male consumers have greater intention to buy the product after touching it ($F(1,12 = 4.22$; $p< 0.06$; $M_{touch} = 5.00$ vs. $M_{no\ touch} = 2.60$). Second, when female consumers do not touch (vs. touch) the products, they report higher scores for satisfaction ($F(1,25 = 3.75$; $p< 0.06$; $M_{touch} = 4.69$ vs. $M_{no\ touch} = 6.07$). On the other hand, when male consumers do not touch (vs. touch) the products, they report



Note: Significant two way interactions; negative (lower scores) and positive (higher scores) emotions; scale 1 to 10 points.

Figure 1: Moderating Effects of Touch and Gender on Purchase Intention, Satisfaction, and Emotion (Study 2)

lower scores for satisfaction ($F(1,12 = 0.63$; $p< 0.44$; $M_{touch} = 6.37$ vs. $M_{no\ touch} = 5.40$). Third, greater scores for emotion (happiness, pleasure, etc.) appear for females in the no touch condition ($F(1,25 = 3.21$; $p< 0.08$; $M_{touch} = 4.09$ vs. $M_{no\ touch} = 5.34$). On the contrary, greater scores on emotion (happy, pleasure, etc.) appear for males in the touch condition ($F(1,12 = 1.55$; $p< 0.23$; $M_{touch} = 5.40$ vs. $M_{no\ touch} = 3.75$). These results suggest that positive emotion is more present for females than for males in the absence (vs. presence) of touch.

6. STUDY 3

6.1. Design

In the third study, our main goal is to again test the generalizability of the Need For Touch scale and its nomological validity, and to analyze whether the sense of touch influences consumer uniqueness and the dependent and interdependent problem solving. We believe that the sense of touch influences persuasion. A total of 79 MBA graduate students answered the questionnaire, which had three dimensions: need for touch, uniqueness, and exclusivity on problem solving.

6.2. Measurement

Consumers' need for uniqueness is defined as an individual's pursuit of differentness relative to others that is achieved through the acquisition, utilization, and disposition of consumer goods for the purpose of developing and enhancing one's personal and social identity (TIAN, BEARDEN, and HUNTER, 2001). The desire for unique consumer products scale (DUCP – LYNN and HARRIS, 1997) is an individual differences measure designed to quantify the desire for unique consumer goods, services, and experiences. The scale comprises eight items designed to tap into this desire (TERMAN, 2007). For example, the scale contains items such as "I am more likely to buy a product if it is scarce" (see Appendix II for full DUCP scale and Appendix III). Lynn and Harris (1997) comment that this scale was created to deal with several critical flaws in the Snyder and Fromkin (1977) need-for-uniqueness scale (NU). The first criticism of the older scale centers on its multidimensionality (LYNN and HARRIS, 1997). Lynn and Harris (1997) suggest that because the NU scale loads on three different factors, the overall scoring on the scale is difficult to interpret. Further, they note that the scale overemphasizes public and socially risky displays in the quest for uniqueness. For example, people who want to satisfy their uniqueness needs without alienating others may acquire rare, inconspicuous possessions. The final criticism of the scale is most relevant to the present investigation. The NU scale does not include any items pertaining to consumer products. Consumers acquire and display material possessions for the purpose of feeling differentiated from other people and, thus, are targeted with a variety of marketing stimuli that attempt to enhance self-perceptions of uniquenes (TIAN, BEARDEN, and HUNTER, 2001). Hence:

H_{11} – NFT is associated with desire for unique consumer products.

The second scale is an independent-interdependent problem-solving scale, which is a general-purpose measure of dispositional preferences for independent and interdependent problem-solving (RUBIN, WATT, and RAMELLI, 2012). The scale measures of 10 items. Participants respond using a point Likert-type response scale anchored by "Strongly Agree" and "Strongly Disagree". Five of the items measure the preference for independent problem-solving, and five measure the preference for interdependent problem-solving. Independent problem-solvers prefer to work on their own when solving problems. In contrast, interdependent problem-solvers prefer to consult with other people (CROSS, BACON, and MORRIS, 2000). An example of an item measuring independent problem-solving: "When faced with a difficult personal problem, it is better to decide yourself rather than to follow the advice of others". According to Cross, Bacon, and Morris (2000), individuals who scored high on the Relational-Interdependent Self-Construal (RISC) Scale characterized their important relationships as closer and more committed than did individuals who scored low on this measure (Study 1) and were more likely to take into account the needs and wishes of others when making decisions (Study 2). In Study 3, using a dyadic interaction paradigm with previously unacquainted participants, the partners of persons who scored high on the RISC scale viewed them as open and responsive to their needs and concerns; these perceptions were related to positive evaluations of the relationship:

H_{12a} – Interdependent problem solving is associated NFT.

H_{12b} – Independent problem solving is associated with NFT.

6.3. Results

The initial exploratory factor analysis showed two factors (69% variance explained, Varimax rotation) to an instrument that is bidimensional (KMO = 0,86). The 4-item autotelic scale has a coefficient α of 0.88 (M = 5,74), while the 5-item instrumental scale has a coefficient α of 0.87 (M = 6,28). The cronbach alpha was very high.

The independent-interdependent problem-solving exploratory factor analysis showed two dimensions for the scale (Kaiser-Meyer-Olkin = 0.67; $p < 0.000$). This structure presented the first dimension as independent, and the second dimension as interdependent (variance explained 33%, and 23% respectively). The 5-item interdependent scale has a coefficient α of 0.77 (M = 5,99), while the 5-item independent scale has a coefficient α of 0.78 (M = 5,28).

Moreover, the desire for unique consumer products exploratory factor analysis showed two dimensions for the scale. We excluded the item "I like to try new products and services before others do". The 7-item scale has a coefficient α of 0.85 (M = 5,57).

The correlation matrix is shown in Table 8. Initially, all variables are associated with the independent-interdependent problem-solving construct. Secondly, NFT did not show an association with desire for unique consumer products. Third, NFT shows association with only one dimension, the interdependent (r = 0.27 and r = 0.24).

In addition, the results showed that independent problem-solving construct had a significant and direct effect over NFT (β = 0.22; t=2.00; p<0.05) and that interdependent problem-solving construct also had a significant effect over NFT (β = 0.31; t=2.82; p<0.01). It suggests that the dependence or independence in problem-solving influences the way that consumers will get information by the touch. The impact of independent problem-solving over NFT was moderated by the desire for unique consumer products scale (DUCP) (β = 0.20; t=2.98; p<0.01). When desire for unique is low, independent problem-solving has negative effect over NFT. When desire for unique is high, independent problem-solving has positive effect over NFT. See Figure 2 for details. Otherwise, the impact of interdependent problem-solving over NFT was not moderated

Table 8

Correlation Matrix of the Constructs (Study 3)

Variables	1	2	3	4	5	6
1. NFT Autotelic	1					
2. NFT Instrumental	0.83**	1				
3. NFT Global	0.96**	0.95**	1			
4. Independent	0.19	0.12	0.16	1		
5. Interdependent (by others)	0.27*	0.24*	0.27	-0.17	1	
6. Independent-Interdependent Global	0.35**	0.27*	0.33**	0.73**	0.53**	1
7. Unique (desire for)	0.10	0.21	0.16	0.31**	-0.10	0.20

Note: *p < 0.05; **p < 0.01; ***p < 0.001.

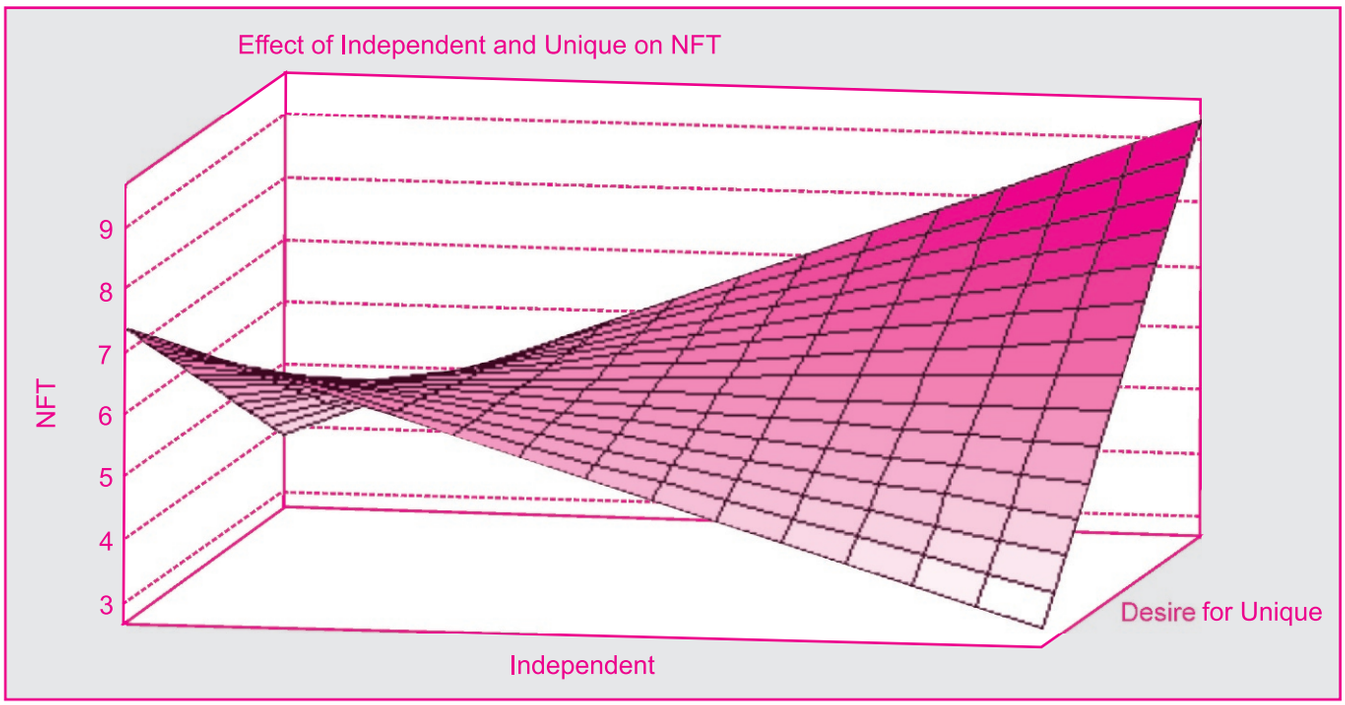


Figure 2: Moderating Effects of Desire for Unique and Independent Problem over NFT (Study 3)

by the desire for unique consumer products scale (DUCP) ($\beta = 0.03$; $t = 0.35$; $p<0.72$).

7. FINAL REMARKS: MANAGERIAL IMPLICATIONS

Study 1 has as a core goal the analysis of the international psychometric proprieties of the 12-item NFT scale. As an initial contribution, the instrument really possesses the hypothesized two-factor structure, demonstrating high reliability in each of the two dimensions. The dual characterization of NFT from both the retail as well as the psychological literature on motivations (and empirically confirmed here) is consistent with the perspective of NFT as a multi-dimensional construct with Instrumental and Autotelic Touch. The 4-item autotelic scale has a coefficient α of 0.85, while the 5-item instrumental scale has a coefficient α of 0.83.

Second, even though H_{4a} was not supported, H_{4b} was confirmed. This result, in addition to convergent validity using Garver and Mentzer (1999) *t*-values above 1.96, indicates that the instrument has convergent validity. For example, all *t*-values in the confirmatory factor analysis were above 8.56 ($p < 0.00$).

Third, the Need for Tactile Input is related positively to the instrumental and autotelic dimensions of NFT. The reduced NFC scale, as predicted, is neither related to the instrumental nor the autotelic, supporting the discriminant validity and demonstrating that they are not the same phenomenon. The impulsive instrument is positively associated to the autotelic, since this last one denotes touch as an end in and of itself.

McDaniel and Baker (1977) show that a negative packaging attribute can sometimes lead to higher product quality evaluations. The researchers found that potato chips in polyvinyl (vs. wax-coated) bags, which were harder to open, led consumers to believe the chips tasted better. It could be that harder-to--open bags were seen as sealing in the freshness of the chips and hence were diagnostic for product evaluation (KRISHNA and MORRIN, 2008). Based on that, we can assume that touch affects the taste of products. Thus, international potato chip companies can assess the best bag for presenting to their consumers and influencing the perceived flavor.

The empirical findings support the notion that touch influences consumer decision making. Supermarkets such as Wal-Mart, Morrisons, and Tesco, can present the opportunity for men to touch soap products inside the store. This generates more information and the confidence to make a better judgment. Specific products for men, such as Dove Man Care, can sell more units using this retail strategy.

In addition, organizations should invest in touch in order to create better consumer experiences. For instance, the use of multi-touch technology (as found in iPads etc.) allows retailers to make a portion of the in-store experience as familiar to consumers as the mobile devices they carry with them every day.

Does food served on a paper plate taste worse than the same food served on a china plate? Does mineral water served in a flimsy cup taste worse than the same water served in a firmer cup? Companies need to observe that the firmness of a cup in which water is served affects consumers' judgments of the water itself (KRISHNA and MORRIN, 2008). The result is especially relevant to Perrier and Nestle in the mineral water segment. In addition, McDonalds, Burger King, and Subway can use this information in serving their soda to clients.

Another conclusion is that the NFT Autotelic dimension has a moderator effect, since when the consumer has a higher NFT autotelic score (e.g. touching by fun), the experiential motivation for shopping plays a more important role in impulsive motivation. On the other hand, if the consumer has a higher NFC score, the instrumental NFT dimension plays a more important function in predicting NTI, given that the instrumental factor reflects outcome-directed touch with a prominent purchase goal. On the other hand, if the consumer has a lower NFC score, autotelic NFT will play a more important role in predicting NTI, since the autotelic factor corresponds to no necessarily salient purchase aim. In summary, it is important to note that the moderator role of the NFT autotelic dimension calls out for further study, as does its mediator role.

The autotelic and instrumental dimensions of Need For Touch were not associated with the desire for unique consumer products. It means that the need for touch did not entail consumers being unique in the products chosen (e.g. tattoos). Touching is a way of acquiring information, and Study 3 showed that it is also a way of involving others in interdependent problem-solving. Thus, consumers can touch the product and then show it to friends, which helps in acquiring information for problem-solving.

The international interest in haptic (touch) information in consumer behavior and marketing is growing (WORKMAN, 2009; JANSSON-BOYD, 2011a, 2011b; KRISHNA, 2011; PECK and JOHNSON, 2011; SHU and PECK, 2011; SPENCE and GALLACE, 2011). However, the correspondence between a self-reported measure of whether touch is important to product evaluation and a behavioral measure of actual touching behavior during product evaluation has not been demonstrated. Study 2 demonstrates this correspondence and examines an individual's preference for haptic information (Need For Touch) as a moderator variable influencing different relationships in marketing. The first main conclusion is that we support the bi-dimensional structure of the need for touch. Just a few variables had crossover loads, but the general structure of the autotelic and instrumental dimension exists.

There is a moderating effect of gender × sense of touch on consumer intention. Greater response scores exist for female and no possibility of touch, but lower intention scores exist for males with no opportunity for touch. This result could help retailers in merchandizing strategies to different segments. This finding is in agreement with Workman's (2009) study, in which fashion change agents and females had a greater NFT — total, autotelic, and instrumental — than fashion followers and males. Fashion change agents and females scored equally

high in the autotelic and instrumental dimensions of NFT, but fashion followers and males scored higher in the instrumental than the autotelic dimension.

Future investigations should test other associations with NFT, looking to strengthen the phenomenon in a nomological network. These studies can analyze:

- attitude toward product and confidence in the purchasing moment, as consequences of touch;
- the NFT construct and its relationship with attention and memory — for instance, higher NFT individuals might be able to more readily retrieve information from memory than those with lower NFT;
- finally, according to data, it is important to note that two instrumental variables showed problems (NFT 10 and NFT 11), since they had high loads in both dimensions. ◆

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ABSTRACT

The relationship between need for touch and desire for unique products and (inter)dependent problem-solving

Some people cannot buy products without first touching them, believing that doing so will create more assurance and information and reduce uncertainty. The international consumer marketing literature suggests an instrument to measure consumers' necessity for pohysical contact, called Need for Touch (NFT). This paper analyzes whether the Need for Touch structure is empirically consistent. Based on a literature review, we suggest six hypotheses in order to assess the nomological, convergent, and discriminant validity of the phenomenon. Departing from these, data supported four assumptions in the predicted direction. Need for Touch was associated with Need for Input and with Need for Cognition. Need for Touch was not associated with traditional marketing channels. The results also showed the dual characterization of Need for Touch as a bi-dimensional construct. The moderator effect indicated that when the consumer has a higher (vs. lower) Need for Touch autotelic score, the experiential motivation for shopping played a more (vs. less) important role in impulsive motivation. Our Study 3 supports the NFT structure and shows new associations with the need for unique products and dependent decisions.

***Keywords*:** haptic information, scale, touch, cognition, input.

RESUMEN

La relación entre necesidad de tocar y deseo por productos únicos y la resolución de problema (inter)dependiente del consumidor

Algunas personas pueden dejar de comprar productos si no los han tocado antes, porque creen que hacerlo podría generar más garantía de información y reducir la incertidumbre de la compra. La literatura sugiere un instrumento para medir la experiencia del tacto, que se denomina necesidad de contacto. El objetivo en este estudio es analizar si la necesidad de contacto es empíricamente consistente. Con base en la revisión de la literatura, se sugieren algunas hipótesis para estudio con el fin de evaluar la validez nomológica, convergente y discriminante de este fenómeno. Cuatro de las hipótesis tuvieron apoyo en la dirección esperada. La necesidad de tocar aparece asociada con dependencia e interdependencia en la toma de decisión. La necesidad de tocar no presentó relación con el deseo de consumir productos únicos. Los resultados mostraron el constructo como bidimensional. El efecto moderador también se encontró. Esto significa que cuando los consumidores tienen más (frente a menos) necesidad de tocar, la motivación para hacer compras experimentales juega un papel más (frente a menos) importante sobre la motivación impulsiva.

***Palabras clave*:** necesidad de tocar, producto único, dependencia.

APPENDIX I

NFT Pearson Correlation Matrix (Summated Scale)

Dimension	Variable	1	2	3	4	5	6	7	8	9	10	11	12
NFT A1	When walking through stores, I can't help touching all kinds of products	1	0,42**	0,47**	0,53**	0,51**	0,40**	0,43**	0,61**	0,55**	0,41**	0,21	0,33**
NFT A2	Touching products can be fun	0,35**	1	0,42**	0,51**	0,26	0,50**	0,34*	0,66**	0,36*	0,34*	0,43**	0,37*
NFT I3	I place more trust in products that can be touched before purchase	0,42**	0,44**	1	0,84**	0,43**	0,51**	0,34**	0,66**	0,36*	0,34*	0,43**	0,37*
NFT I4	I feel more comfortable purchasing a product after physically examining it	0,37**	0,33**	0,67**	1	0,42**	0,58**	0,27	0,61**	0,33*	0,33*	0,34*	0,30*
NFT A5	When browsing in stores, it is more important for me handle all kinds of products	0,33**	0,42**	0,22**	0,11	1	0,43**	0,53**	0,54**	0,64**	0,44**	0,32*	0,26
NFT I6	If I cannot touch a product in the store, I am reluctant to purchase the product	0,24**	0,31**	0,23**	0,27**	0,43**	1	0,29	0,57**	0,34**	0,67**	0,55**	0,53**
NFT A7	I like to touch products even if I have no intention of buying them	0,34**	0,40**	0,38**	0,18*	0,54**	0,32**	1	0,62**	0,77**	0,23	0,33*	0,42**
NFT I8	I feel more confident making a purchase after touching a product	0,29**	0,36**	0,63**	0,60**	0,37**	0,45**	0,45**	1	0,60**	0,37*	0,43**	0,53**
NFT A9	When browsing in stores, I like to touch lots of products	0,39**	0,34**	0,29**	0,22**	0,57**	0,41**	0,63**	0,39**	1	0,41**	0,46**	0,57**
NFT I10	The only way to make sure a product is worth buying is to actually touch it	0,25**	0,32**	0,30**	0,29**	0,47**	0,54**	0,44**	0,56**	0,46**	1	0,66**	0,58**
NFT I11	There are many products that I would only buy if could handle them before purchase	0,27**	0,36**	0,42**	0,34**	0,38**	0,52**	0,42**	0,50**	0,49**	0,65**	1	0,79**
NFT A12	I find myself touching all kinds of products in stores	0,37**	0,37**	0,30**	0,26**	0,59**	0,39**	0,56**	0,44**	0,62**	0,55**	0,51**	1

Note: *p < 0.05; **p < 0.01; ***p < 0.001; above diagonal Study 2; under diagonal Study 1.

APPENDIX II

DUCP Scale

1. I am very attracted to rare objects.
2. I tend to be a fashion leader rather than a fashion follower.
3. I am more likely to buy a product if it is scarce.
4. I would prefer to have things custom-made than to have them ready-made.
5. I enjoy having things that others do not.
6. I rarely pass up the opportunity to order custom features on the products I buy.
7. I like to try new products and services before others do.
8. I enjoy shopping at stores that carry merchandise which is different and unusual.

APPENDIX III

THE IIPSS

Please indicate how much you agree or disagree with each of the following items.

1. When faced with a difficult personal problem, it is better to decide yourself rather than to follow the advice of others.
2. I value other people's help and advice when making important decisions.
3. In general, I do not like to ask other people to help me to solve problems.
4. I prefer to make decisions on my own, rather than with other people.
5. I like to get advice from my friends and family when deciding how to solve my personal problems.
6. I prefer to consult with others before making important decisions.
7. I usually find other people's advice to be the most helpful source of information for solving my problems.
8. I would rather struggle through a personal problem by myself than discuss it with a friend.
9. I do not like to depend on other people to help me to solve my problems.
10. I usually prefer to ask other people for help rather than to try to solve problems on my own.