

THE INFLUENCE OF VIVIDNESS AND METACOGNITIONS ON ONLINE INFORMATION PROCESSING

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ABSTRACT

The lack of physical contact between products and consumer represents a key characteristic of online environments that can influence consumer's purchase behavior. In an effort to offer a close experience with the product, websites usually present vivid information in order to convince consumers about the goodness of their products. Vivid information is likely to prompt different aspects of the purchase process, like reduced feelings of uncertainty or a higher need for physical information. This research adopts a metacognitive perspective by considering the potential effects of the ease with which vivid information evokes imagination on the impact of vivid information on consumers' attitudes and intentions. Furthermore, it is proposed that individual differences, related to the consumer's need to touch products, could influence the preferences toward the channel to carry out the purchase. The results of an experiment, which manipulated the presence and the style of product presentation videos, support the importance of vivid information in order to favor consumers' attitudes and purchase intentions, as well as to influence the relative preference for the purchase channel. Additionally, message and consumer characteristics are found as important factors that affect these relationships.

KEYWORDS:

Vivid product information, metacognition, ease of imagination, attitude, channel preference, need for touch

1. Introduction

The lack of physical interaction between people and products is one of the main characteristics of the online environment. Current research tends to reveal a decrease in overall online purchase risks, due to the development of security and warranty systems and the gradually maturation of Internet users (e.g., Dholakia et al., 2005; Verhoef et al., 2007). However, the inability to physically examine products on the computer screen is still considered a key deterrent of online shopping (Citrin et al., 2003; Cho et al., 2006). Consumers may delay purchase decisions if they are uncertain about whether the product will perform as expected (Greenleaf and Lhemann, 1995). Thus, consumers may have some level of experience with the Internet to research products (Verhoef et al., 2007), they may trust the websites they are familiarized with, but they may hesitate online shopping because they cannot touch the product, and finally buy the product in the physical store (Cho et al., 2006). In fact, recent studies reveal that, though online shopping figures increase every year, the major behavioral trend of online users is characterized by an extensive search for information on the Internet and an eventual purchase in the brick-and-mortar channel (Verhoef et al., 2007; Dholakia et al., 2010).

The evolution of the online environment has provided with alternative product experiences, that allow consumers to get a close and realistic impression of the tangible, sensory and experiential aspects of the product (Li et al., 2002, 2003; Jiang and Benbasat, 2007b). The importance of presenting vivid information has been acknowledged as a critical aspect of the online product presentation (Coyle and Thorson, 2001). Vivid information has the potential to bring the consumer closer to a direct experience (Nowlis et al., 2004), thus improving their understanding of products and their attitudes (Li et al., 2003; Coyle and Thorson, 2001; Jiang and Benbasat, 2007a,b). In the online environment, several studies have focused on the analyses of different presentation techniques, with varying degrees of interactivity and vividness (Li et al., 2002, 2003; Fiore et al., 2005; Park et al., 2005), in order to understand their effects on online users' behavior. The general finding on current literature reveals a positive effect of vivid information on users' attitudes and purchase intentions on the website (e.g. Coyle and Thorson, 2001; Li et al., 2003; Fortin and Dholakia, 2005). However, the majority of studies examining vividness effects in the online environment have considered the Internet channel exclusively, neglecting the traditional physical channel. Vivid information can offer a close, realistic experience to online consumers, which may reduce their uncertainty about the product and make them more willing to buy it online. Alternatively, vividness can also appeal to imagination about the physical aspects of the purchase and prompts the consumer to seek a direct experience (Li et al., 2003; Jiang and Benbasat, 2007a)

We argue that if the need for sensory, physical or experiential information about the product emerges, consumers may prefer to go to the bricks-and-mortar store to carry out the purchase episode. Thus, although vivid information in the online product presentation may enhance users' attitude toward the product and purchase intentions, it can also affect their preferences for choosing the purchase channel. In so doing, we offer a broader understanding about how vividness can operate in the virtual environment to influence consumers' shopping process. Conceptually, we stress the importance of the ease with which vivid information can alter the imagination of consumers, which should be incorporated to the study of vividness effects in online environments. The implications of our study can help virtual and multichannel retailers to effectively use vivid presentation techniques, which can influence consumers' preferences for the product and the channel to carry out the purchase.

Consequently, this research examines how consumers process vivid information of the online product presentation. We adopt a metacognitive perspective (Schwarz, 2004; Petty, 2006; Cohen and Reed, 2006; Petrova and Cialdini, 2008) in order to analyze whether vivid information can affect consumers' attitudes toward the product and persuade them to buy it. Given the potential of vivid information to stimulate imagination, the ease to elaborate imaginative thoughts is proposed as the underlying mechanism that may explain these relationships. In addition, we consider the potential impact of vivid information on consumers' purchase channel preferences. At this point, it should be important to note that individual differences, related to the chronic accessibility to haptic information (Citrin et al., 2003; Peck and Childers, 2003), are likely to moderate the effects of online vivid information on users' purchase channel preferences.

2. Theoretical Framework

Traditionally, vivid information has been defined as information that likely attracts consumers' attention and appeals to their imagination, is emotionally interesting and proximate in a sensory, temporal, or spatial way (Nisbett and Ross, 1980; Keller and Block, 1997; Nowlis et al., 2004)¹. According to this perspective, vivid information can be any piece of information (e.g., pictures, audiovisual content, colorful exemplars and metaphors, narrations of past experiences with the product), that evokes the physical and experiential aspects of the purchase. Research regarding vividness effects on persuasion and on attitudes' formation has received special attention in the consumer behavior literature. It has demonstrated different influences on consumers' information processing depending on their characteristics and the context in which the information is presented (e.g., Petrova and Cialdini, 2005, 2008).

On the one hand, vivid information can influence cognitive processing, because it is more interesting and prompts a more thorough review of product-related information than pallid information (Jiang and Benbasat, 2007b). According to the availability-valence hypothesis (Kisielius and Sternthal, 1984), vividness can stimulate cognitive elaboration of information and enhance the availability of previous stored information in consumer's mind, which can increase or decrease product preferences depending on the valence of the information made accessible. In this way, previous studies have revealed that increasing the vividness of product depictions result in greater product-relevant thoughts and recall of the product information (Petrova and Cialdini, 2005). Some authors have also found that vividness can have negative, even zero, persuasive effects on consumers (Keller and Block). Frey and Eagly (1993) showed that type of task or the attention devoted to it can undermine the persuasion of information, given that the vivid aspects of the message can distract consumers' information processing of the relevant arguments.

On the other hand, vividness can affect imagery processing of information. Imagery is a conceptually distinct way of representing information, which "involves concrete sensory representations of ideas, feelings, and memories" (MacInnis and Price, 1987; p. 474). Unlike discursive processing, which focuses on the specific elements of the message, imagery processing relates to stored knowledge and has the potential to transport consumers to a different reality, such as hypothetical purchase situations or consumption episodes (Epstein, 1994; Escalas, 2004). Several researchers have largely demonstrated the direct relationship between vivid information and mental imagery processing, which can influence product evaluations and intentions in a great extent (MacInnis and Price, 1987; Shiv and Huber, 2000; see Petrova and Cialdini, 2008 for an excellent review). In this sense, products depicted vividly can stimulate consumers' imagination about how the product would be or about hypothetical consumption situations (Escalas, 2004), or anticipate the satisfaction or pleasure derived from using or consuming the product (Shiv and Huber, 2000; Nowlis et al., 2004).

In the online environment, several studies have analyzed how the levels of vividness provided by different interactive presentation techniques affect users' attitudes toward the brand (Fortin and Dholakia, 2007), the website (Fiore et al., 2005), and the online purchase intentions (Li et al., 2002, 2003). Most of this literature generally supports the positive direct effects of vivid information on influencing consumers. However, there is a lack of literature about the psychological mechanisms through which vivid product information may operate to affect online users' evaluations and intentions. Given the consumers' need to form a realistic impression of the product on the web in order to consider its purchase, we focus on the potential role of vividness to influence imagery processing related to how the product would perform and how the future consumption experiences would be.

Theoretically, we adopt a metacognitive perspective to propose that when the consumers access to vividly product depictions on the Internet, the ease with which vivid information prompts imagination

¹ This concept differs from Steuer's definition of vividness (1992), who adopts a technological perspective to define vividness as the "representational richness of a mediated environment as defined by its formal features, that is, the way in which an environment presents information to the senses" (p. 81). Rather than considering the technological aspects of the product presentation, we focus on vividness from a psychological point of view, which relates to the capacity of vivid information to affect consumer's information processing and judgment.

represents a validation process by which attitudes and intentions can be established (Schwarz, 2004; Petty et al., 2002; Petty, 2006). Recently, metacognitions, or thoughts about thoughts (Briñol et al., 2004), have been incorporated into the study of information processing and persuasion, in order to better understand how attitudes are formed and change, as well as how decisions are made. According to these multiple processes models (Petty, 2006; Cohen and Reed, 2006), once the individual has processed a given piece of information, an internal process takes place so that all the thoughts that have emerged are validated or invalidated (Petty et al., 2002). Cognitive processes are usually accompanied by metacognitive experiences, such as the ease with which information can be accessible from memory or the fluency with which new information can be processed (Schwarz, 2004). In this way, judgments can be influenced not only by the content of the message, but also by the ease with which the individual generates or process this information (Nowlis et al., 2004). These experiences are informative for consumers, who incorporate them in their judgments and decision making (Petrova and Cialdini, 2008). Anyhow, there are circumstances under which metacognitive processes are more or less likely to occur. Past research has pointed out that the degree of motivation and ability to process information determines the influence of message-relevant content and the use of metacognitions to validate the thoughts generated (Briñol et al., 2004). Following this line of inquiry, the study of metacognitions in the online information search behavior may be especially relevant. Internet users who research products on the Internet are assumed to have a certain degree of involvement with the product or the purchase situation (e.g., Balasubramanian et al., 2005; Konaş et al., 2008). They also tend to have the appropriate skills and no time constraints to gather and process information thoroughly (Flavián et al., 2010). As a consequence, consumers are placed in a suitable context to carry out metacognitive evaluations about the validity of the information in order to generate more accurate judgments.

The ease of imagery generation represents a metacognition that can influence product evaluations and purchase intentions (Petrova and Cialdini, 2008). Information that is easily generated may have a greater weight in the formation of attitudes. The consumer may consider the ease or difficulty to elaborate thoughts about the product as an argument in favor or against it (Schwarz, 2004). Information processing literature also reveals that the characteristics of the message can exert a great influence on how information is processed and the impact on attitudes and intentions (Petty et al., 2002; Petrova and Cialdini, 2005). In this line, the way of presenting information is likely to affect the ease, extent, and type of elaboration that the consumer generates. More specifically, information vividness may facilitate the elaboration of imaginative thoughts (MacInnins and Price, 1987; Escalas, 2004). There is evidence that vivid presentations of products can influence consumers' anticipation of consumption outcomes, and the ease with which this anticipation is created affects the final evaluations and decision outcomes (Shiv and Huber, 2000; Nowlis et al., 2004). In addition, concrete vivid information may diminish the uncertainty related to product performance, given that vivid depictions of product information may compensate for a lack of haptic information (Peck and Childers, 2003).

Consequently, we analyze the effects of presenting product information vividly on consumers' attitudes and purchase intentions, formed in an electronic commerce environment. The role of ease of imagery generation about product performance and hypothetical consumption situations is examined as the potential vehicle for these effects. Specifically, we examine whether high levels of vividness in online product presentations, and different types of vividness, influence the attitude toward the product and the intention to buy it from the virtual or physical store. In this way, we propose that vivid depictions of products online can have two different effects on consumers' channel preferences for the purchase: on the one hand, vivid information can influence positively online purchase intentions, given the reduced risks associated with product performance and purchase outcomes (Jiang and Benbasat, 2007a); on the other hand, vivid information may evoke the physical and sensory aspects of the purchase process (Li et al., 2003), and consequently lead the consumer toward a shopping experience in the physical channel. Finally, an individual trait called need for touch (NFT), developed by Peck and Childers (2003), is examined as a potential moderator variable of all these relationships, given that people may differ in their needs for tactile information when considering the purchase of a product (Citrin et al., 2003)

Vividness' operationalization is made by means of displaying product information in a video format (Li et al., 2003; Jiang and Benbasat, 2007a,b). Product presentation videos (PPV henceforth) represent audiovisual resources that can help consumers to know the product on the Internet. These tools possess certain levels of interactivity (i.e., stop, reproduce, still, rewind, put forward), while their main feature is derived from their capacity to depict the product in a vivid manner². Online users have then an opportunity to access to some sort experience with the product prior to the purchase. In addition, due to the development of video broadcasting platforms, such as YouTube or Vimeo, the amount of video material in the online environment is boundless, as well as the variety of their contents; businesses, expert sources, consumers and online users in general, are sharing videos with others with to introduce products from different perspectives and situations. In spite of their important volume and plausible impact, current research on the effectiveness of PPV is scarce, compared with the study of other ways of presenting product information vividly on the Web, such as rich interactive tools or electronic word of mouth. A better understanding of the effects of PPVs is needed in order to ascertain how different types of vividness affect information processing and the purchasing process. The present research tries to advance in such an understanding by examining the effects of two qualitatively different kinds of PPV: promotional videos and demonstrative videos. Promotional videos are defined as audiovisual content created by the brand to present the product to the consumer. With this type of videos, companies try to catch users' attention through appealing to creative elements, such as music or animation. Online users can encounter with a promotional video in different points of the online navigation: promotional videos can be found in landing pages, brand's official websites, or popular broadcasting platforms. The other type of PPV, demonstrative video, constitutes a "scene" where the "actor" presents the product in a consumption situation, explain its characteristics, or examine it through different tests. Through demonstrations, online users may have access to a realistic experience with the product, where they observe how another human being handles and interacts with it. This information has the potential to diminish product uncertainty, given its closeness to direct experiences.

3. Research hypothesis

3.1. Direct effects of PPVs

Vivid information has the capacity to evoke imagery, which can affect product evaluations in a great extent (Petrova and Cialdini, 2008). Specifically, in the context of positively-framed vivid information about the product and hypothetical consumption situations, and when individuals possess adequate levels of motivation and capacity to process information, vividness has been demonstrated to impact favorably consumer's attitudes (e.g., Frey and Eagly, 1993; Coyle and Thorson, 2001; Escalas, 2004). In the case of videos, if PPVs can present information vividly to users, their attitude toward the product may be altered as a consequence of the enhanced imagery elaboration that is generated. Previous research has already found direct, positive effects of product videos on users' attitude toward the product (e.g., Li et al., 2003). In this way, Jiang and Benbasat (2007a,b) compared different levels of interactivity and vividness of product presentations. Their findings revealed that video-format presentations (i.e., video without narration and video with narration), through increased levels of diagnosticity of information, enhanced users' attitudes toward the product.

It is important to note, however, that the type of PPV can have differential impacts on product's attitudes. From an advertising perspective, promotional and demonstrative videos may resemble some characteristics of traditional television ads and infomercials (Singh et al., 2000), respectively. Promotional videos share some characteristics of traditional television ads to the extent that both use appealing contents to attract and entertain consumer's attention. Demonstrative videos and infomercials can be viewed as similar to the extent that they may offer the consumer an impression of the product proximate to a direct experience (Singh et al., 2000). However, unlike television settings, consumers play more active roles in the communication process in the online environment (Flavián et al., 2010). Online users self-select information and want to process content that they choose (Pavlou and Stewart, 2000). In this way, due to the different characteristics of promotional and demonstrative

² Previous findings regarding the effects of interactivity and vividness in online product presentations supports the consumer's overall preference for medium levels of interactivity (rather than low or high), while high levels of vividness are always better valued (Coyle and Thorson, 2001; Fortin and Dholakia, 2005; Jiang and Benbasat, 2007b)

videos (e.g. promotional videos may increase arousal and entertainment, while demonstrative videos may be more concrete and realistic), the type of PPV may influence differently the cognitive and affective dimensions of attitudes, and thus yield differences in product's evaluations.

Hypothesis 1: The presence of (a) a promotional video, (b) a demonstrative video, versus the absence of PPV, will affect positively the attitude toward the product.

Secondly, purchase intentions may be positively affected when the online product presentation is displayed vividly with the presence of a PPV. Vivid information can lead the consumer to anticipate the pleasure or satisfaction of having the product (Shiv and Huber, 2000; Nowlis et al., 2004), thus increasing the desire of having it. The potential impact of vivid information on purchase intentions is well documented in the literature, which is often determined by the valence of the imagination that the consumer is able to generate (Petrova and Cialdini, 2008). In the specific context of online product presentations, there is evidence supporting the positive relationship between the use of vivid and interactive presentations and the consumer's willingness to buy the product (Park et al., 2005). Thus, we may expect that the visualization of a video that presents the product vividly would increase consumer's purchase intentions. Again, we should note that the type of PPV may play a different role to determine purchase intentions. In this way, past research in the advertising domain has demonstrated differential effects for the type of advertisement on product purchase intentions. Specifically, infomercials, due to its greater closeness to direct experience with the product, are more likely to affect purchase intentions than conventional ads. Therefore, we expect that demonstrative videos and promotional videos will exert different impacts on consumer's product purchase intention.

Hypothesis 2: The presence of (a) a promotional video, (b) a demonstrative video, versus the absence of PPV, will affect positively the purchase intentions of the product.

Taking into account the above hypothesized effects, we may suggest that the presence and type of PPV could have different effects on the consistency between attitudes and behaviors. Coyle and Thorson (2001) demonstrated that websites containing high levels of vividness produced a greater consistency between attitudes and intentions toward the product and the website. This is due to the rich content that appeals to multiple senses of vivid information, which can contribute to the perception of telepresence, or feelings of "being there" (Steuer, 1992).

Nevertheless, as we propose different impacts for the type of PPV on consumer's attitude toward the product and purchase intentions, we could expect that demonstrative and promotional videos would differ in their capacity to create consistency between attitudes and intention. First, consumer behavior research has shown that attitudes formed through direct experience with the product are more confidently held, enduring, and predictive of subsequent behaviors than those formed through indirect experience (e.g., Singh et al., 2000; Li et al, 2003). To the extent that demonstrative videos can offer a more realistic impression of the product, closer to direct experience than a promotional video, we may propose that this type of video would generate a better consistency between attitudes and behaviors. Second, promotional videos are intended to be highly attractive to consumers, appeal to their arousal and positive affect, and exacerbate claims about the product. So, attitudes formed through the visualization of this type of videos may be exaggerated, provoking less consistency with their behavioral intentions.

Hypothesis 3: The presence of a demonstrative video will result in a greater consistency between attitude toward the product and purchase intentions than the presence of a promotional video.

3.2. Mediation effects of Ease of Imagination

For the present research, we state that the ease with which the consumer can generate imaginative elaboration can affect the processing of vivid information, and this can be used as valuable information to determine consumer's attitudes and purchase intentions. As noted above, vividness of product presentations may induce consumers to elaborate imaginative thoughts about the possible product performance and consumption experiences (MacInnis and Price, 1987; Nowlis et al., 2004). Depicting products vividly has been acknowledged as a provocative element that affects the likelihood of imaginative thinking (Petrova and Cialdini, 2008). In this way, online product presentations which incorporate PPVs are likely to influence positively the degree of imagery thinking and the ease with

which it can be generated, compared to pallid or static presentations of the product. Consumers may consider the ease or difficulty to imagine how the product and/or their consumption experiences would be, and incorporate this information into the formation of judgments and behavioral intentions (Schwarz, 2004). In an online environment, if consumers are able to easily picture the product, they can take into account this information to positively evaluate the product, and develop more favourable purchase intentions. In addition, if the PPV can evoke imaginations that are realistic and proximate in a physical way, rather than elusive or abstract, the ease to create such imagination should lead to a greater consistency between attitudes and intentions (Singh et al., 2000; Coyle and Thorson, 2001). Therefore, we expect that the ease of imagination would mediate the effects of PPVs on the generation of attitudes and intentions, as well as the degree of consistency between them.

Hypothesis 4: The relationship between PPVs and (a) attitude toward the product, (b) purchase intentions, (c) attitude-intention consistency, will be mediated by the ease with which the consumer can generate imagery thinking.

3.3. Moderation effects of Need for Touch on Preference of Purchase Channel

Finally, we should consider the potential impact that information presented vividly on the computer screen can exert on the consumer's preference for the virtual or physical channel to carry out the purchase. Previous studies dealing with vividness in online environments have demonstrated the capacity of this feature of information to influence positively online purchase intentions (Coyle and Thoson, 2001; Fortin and Dholakia, 2005). In this way, PPVs, through the creation of sensory experiences with the product prior to the purchase, are likely to improve consumers' understanding of products and reduce the uncertainty related to product performance (Jiang and Benbasat, 2007b). As a consequence, the perceptions about the website and the consumer's willingness to buy the product from the e-retailer may be favored. However, to the extent that vivid information can appeal to the haptic elements of the purchase, it could have also the ability to drive online users toward the physical store in the search for a direct experience with the product and a physical purchase episode (Li et al. 2003). Therefore, it seems interesting to consider both online and brick-and-mortar channels for the study of vividness effects in virtual environments.

Individual trait differences related to the need for touching and feeling the product may help us to predict what the effect of vividness should be. Previous research on multichannel marketing has pointed out the need to include individual differences in order to understand how and why consumers select and combine the different channels during the shopping process (e.g., Balasubramanian et al., 2005; Konuş et al., 2008). In this way, Dholakia et al. (2010) note that dispositional characteristics of consumers are important to understand channel interactions. Directly related to our research interests, they indicate that individuals with a high need for touch (Peck and Childers, 2003) are likely to gravitate toward physical channels. Need for Touch refers to "a preference for the extraction and utilization of information obtained through the haptic system" (Peck and Childers, 2003; p. 431). The need for tactile input in making product evaluations could play an important role in determining the selection of the purchase channel (Citrin et al., 2003). However, research on the Internet field has overlooked the potential influence of the need for touch products on the online search behavior. Considering individual differences in the need for tactile information may be especially relevant in current online product presentations, where vivid information has the capacity to evoke the physical aspects of the purchase. If the consumer has a high need for touch (Peck and Childers, 2003), the enhanced vividness of product information could provoke a switch of channel toward the physical store. With this regard, Citrin et al. (2003) found that consumers with high levels of tactile information appeared to be deterred from purchasing products online, particularly those products requiring high tactile cues.

Therefore, we propose that the presence of a PPV affects consumers' preference for shopping channel, depending on their dispositional need for touch products. Specifically, if the user does not feel the need to assess the product through tactile information, the greater vividness of the PPV will affect positively the online purchase intention. Conversely, for consumers with a high internal motivation to touch products, vividly depicted information could arouse the need for haptic information, thus affecting their preference for the physical channel.

Hypothesis 5: Need for Touch will moderate the effects of the presence of a PPV on the consumer's preference for the purchase channel.

4. Method

4.1. Design, Context and Stimuli

Hypotheses were tested using a 3 (no-PPV, promotional-PPV, demonstrative-PPV) x 2 (low NFT, high NFT) mixed-factorial experiment. Participants were randomly assigned to one of the three online product presentation conditions, whereas need for touch was measured as a within-subjects factor. We recruited a convenience sample of 297 graduate and undergraduate students of business studies, who enrolled in the experiment in exchange for a free coupon. In order to increase subjects' involvement with the task, they were also told that they would be part of a lottery whose prize was the product that they were going to evaluate. The profile of the sample was similar to the multichannel shoppers profile that has been showed in recent studies (e.g., Verhoef et al., 2007; Konuş et al., 2008).

The context of the experiment was the purchase of a smartphone in a realistic online setting. Smartphones were chosen as the target product because they are especially attractive to the sample demographic. Moreover, for this type of products, a direct experience would ideally be part of the decision process (Gupta and Harris, 2010), given the high importance of both search and experience attributes for the evaluation and the purchase. Thus, participants were placed in a purchase scenario, in which they entered to a fictitious e-retailer's website and attended to an online product presentation with different vivid content. In the no-PPV condition, full, objective product information was displayed, together with a picture of the product. The promotional-PPV condition supplemented the no-PPV by providing a video of the product featured by the brand, which presented the smartphone by means of animation techniques, appealing words, and cheerful music. The demonstrative-PPV was identical to the promotional-PPV condition except the video presented an anonymous person holding the smartphone in his hands, who showed the product by rotating it and used narration to present its characteristics³. Once the participants interacted with the website for a few minutes, they were linked to the web questionnaire which gathered information about the dependent variables and individual characteristics. Manipulation checks were previously performed in a pretest, which allowed us to obtain a successful qualitative difference between the two types of videos. Given that the video should contain a real product, the pretest served also to choose the target brand for the main study.

4.2. Pretest

Participants of the pretest were 125 students, recruited from the same population as the main experiment. First, participants were asked about their attitudes to several brands of mobile devices in order to obtain a reputable brand, with low variability into the sample's preferences, as the target stimulus (e.g. Li et al., 2002). Participants answered to a series of seven-point semantic differential scales (α 's ranging from 0.88 to 0.95; Bruner and Hensel, 1996; Childers et al., 2001; Briñol et al., 2004), assessing their attitudes toward five well-established brands in the mobile phone market (i.e., LG, HTC, Nokia, Sony-Ericsson, Samsung). Non-parametric Fieldman test and planned Wilcoxon contrasts were performed in order to detect the significant differences between the evaluations (Leech et al., 2008). The results yielded a significantly higher preference for the brand Nokia ($M = 6.036$, std. dev. = 0.904). Therefore, Nokia we selected as the target brand for the main study.

The second part of the pretest dealt with the evaluation of two videos about the product, one promotional and one demonstrative, in order to detect qualitative differences about the characteristics that this type of videos can convey. The order of presentation of videos was counterbalanced, and participants responded to seven-point semantic differential scales regarding the aesthetics, arousal, informativeness, concreteness and realism of the PPVs. A series of repeated-measures ANOVAs with the participant's responses regarding the two videos as the dependent variable revealed significant differences between the promotional PPV and the demonstrative PPV. Specifically, the promotional video was significantly more aesthetically appealing (mean diff. = 3.72; $F(1, 124) = 449.487$, $p <$

³ The original videos were manipulated in order to obtain similar durations and contents displayed. We performed an information inventory checklist to ensure the same product-related information appeared in both PPVs.

0.001), and arousing (mean diff. = 3.50; $F(1, 124) = 433.262$, $p < 0.001$) than the demonstrative PPV. In contrast, the demonstrative PPV was rated as more objective (mean diff. = 3.45; $F(1, 124) = 406.887$, $p < 0.001$) and realistic (mean diff. = 3.60; $F(1, 124) = 471.663$, $p < 0.001$) than the promotional PPV. Both videos did not differ significantly in their degree of informativeness (mean diff. = 0.26; $F(1, 124) = 1.388$, $p = 0.241$). Altogether, the results of the pretest allowed us to select two PPVs featuring a Nokia smartphone that successfully included qualitative differences in their characteristics.

4.3. Measures

In the final questionnaire, attitude toward the product was measured in a similar way as in the previous pretest, with the same seven-point semantic differential scales. Given that the items presented good levels of reliability ($\alpha = 0.87$), participants' responses were averaged to form an overall measure of attitude toward the product. Purchase intention was measured by asking participants about the likelihood of purchasing the product (ranging from 1: "very unlikely" to 7: "very likely"). Following past research (e.g., Coyle and Thorson, 2001), the consistency between attitude and purchase intentions was obtained by calculating the difference between the average attitude of participants and their purchase intentions. If the difference between attitudes and purchase intentions was very small, there was greater attitude-behavior consistency. In addition, participants' preference for the purchase channel was measured by asking participants: "If you were to buy the product, you would... definitively buy it online (1)... definitively buy it at the physical store (7)". The middle point of the scale indicated indifference between the two channels.

In order to measure how easily the participants could imagine the product performance and consumption situations, we adapted previously validated scales (Nowlis et al., 2004). Specifically, participants indicated to what extent they agreed or disagreed (1 = totally disagree; 7 = totally agree) with the four following statements: "After viewing the information about the product... (1) it is ease to know how well the product can perform, (2) I can easily imagine myself using the product, (3) it is ease to fantasize about how using the product would be, (4) I can easily imagine myself enjoying the product". Item responses showed good levels of reliability and unidimensionality ($\alpha = 0.84$; one only eigen-value higher than 1 with a 68.7% of explained variance), so they were averaged to form an overall measure of the ease of imagination. Finally, to measure need for touch, participants were asked to fill out the twelve-item scale of NFT developed by Peck and Childers (2003). Scale validation procedures (reliability analysis and factorial analysis) confirmed the two-dimension structure of the scale (i.e., one instrumental dimension related to the aspects of purchase that reflect outcome-directed touch; one autotelic dimension related to the hedonic-oriented aspects of touch). However, results of the hypotheses's testing did not yield different effects among two dimensions. Therefore, the items were collapsed to form a unique measure of individual's NFT.

5. Analysis and Results

5.1. Direct Effects of PPVs

Analyses of variance were carried out in order to test Hypotheses H1 to 3, with attitude toward the product, purchase intentions, and consistency between attitude and behavior as the dependent variables, and the PPV condition as the independent variable. Table 1 summarizes the mean values (standard deviations in brackets) for the dependent variables, F-statistics and significant differences between the PPV conditions. The presence of a PPV produced a significant difference on the participants' attitude toward the product ($F(2, 216) = 5.317$, $p < 0.01$). Participants showed a greater attitude toward the product when either a promotional-PPV ($M = 5.91$) or a demonstrative-PPV ($M = 5.76$) was presented, compared with participants exposed to the no-PPV condition ($M = 5.45$). Tukey HSD post-hoc comparison tests at a significance level of 0.05 (Arnold and Reynolds, 2003) revealed a significant difference between the promotional-PPV condition and the no-PPV condition (mead diff. = 0.46, $p < 0.05$), and a marginal significant difference between the demonstrative-PPV and the absence of PPV (mead diff. = 0.31, $p < 0.1$). Thus, we found evidence to support Hypothesis H1a, whereas H1b was partially supported.

For Purchase Intention variable, again, there was a main effect for the PPV treatment ($F(2, 216) = 4.600, p < 0.05$). Participants who did not visualize a PPV presentation were less likely to purchase the product ($M = 3.49$), compared to participants who visualized a promotional-PPV ($M = 3.73$) and those who visualized a demonstrative-PPV ($M = 4.33$). In support of Hypothesis H2b, post-hoc comparison tests showed that demonstrative-PPVs produced the highest purchase intentions. The superiority of promotional-PPV, compared to the no-PPV condition, showed no significant differences ($p = 0.681$). Hypothesis H2a was then rejected.

TABLE 1
Summary of Direct Effects

Treatment	No PPV	Promotional PPV	Demonstrative PPV	F	Sign.
Dependent variable					
Attitude toward the product	5.45 (1.115)	5.91 ^a (0.633)	5.76 ^b (0.791)	5.317	0.006
Purchase Intention	3.49 (1.840)	3.73 ^c (1.624)	4.33 ^a (1.684)	4.600	0.011
Consistency between attitude and purchase intention	1.96 (1.533)	2.18 ^d (1.438)	1.43 ^d (1.442)	5.474	0.005

^a Significant difference ($p < 0.05$) compared to the No-PPV condition

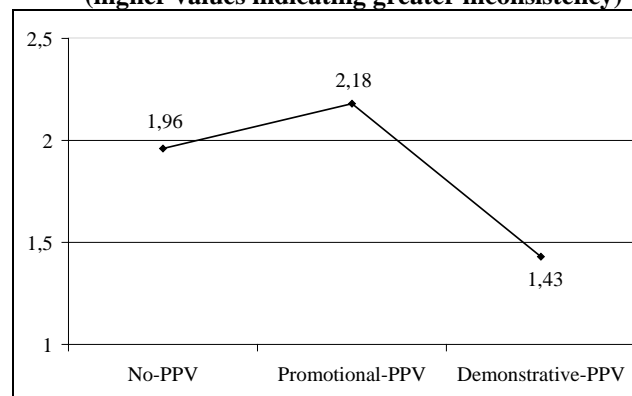
^b Marginal significant difference ($p < 0.1$) compared to the No-PPV condition

^c Marginal significant difference ($p < 0.1$) between promotional-PPV and demonstrative-PPV

^d Significant difference ($p < 0.05$) between promotional-PPV and demonstrative-PPV

Finally, Hypothesis 3 proposed a differential impact between promotional and demonstrative videos on the consistency between attitude toward the product and purchase intentions. The smaller the differences between attitudes and intentions, the greater would be the participant's consistency. The ANOVA analysis revealed a significant effect of the type of PPV on attitude-intention consistency ($F(2, 216) = 5.474; p < 0.01$; see Figure 1 for directional effects). Participants in the demonstrative-PPV condition had a greater consistency between their attitudes toward the product and intentions to purchase the product ($M = 1.43$), followed by the no-PPV condition ($M = 1.96$). Furthermore, participants in the promotional-PPV showed a high degree of attitude-behavior inconsistency ($M = 2.18$). Post-hoc analysis confirmed the significant difference in consistency between the demonstrative-PPV and the promotional-PPV, thus supporting Hypothesis 3.

FIGURE 1
Attitude-behavior consistency between PPV conditions
(higher values indicating greater inconsistency)



5.2. Mediation Effects of Ease of Imagination

We followed Baron and Kenny (1986) mediation analysis' test in order to examine the possible mediating effects of the ease with which imagination can be created on the previously analyzed relationships. Table 2 shows the results of the mediation analysis' tests, which present the beta coefficients and their significance for PPV and ease of imagination in separated regressions and grouped regressions. According to this procedure, mediation is said to exist if three criteria are met: first, the independent variable, vividness treatment, influences the potential mediator, that is, the ease with which imagination about the product performance and consumption experience could be

generated. An analysis of variance, considering the ease of imagination as the dependent variable and the PPV treatment as the independent variable, allowed us to satisfy the first criterion. Specifically, the ease of imaginative elaboration was significantly affected by both a promotional-PPV ($M = 5.62$), and a demonstrative-PPV ($M = 5.68$), compared to the no-PPV condition ($M = 4.99$; $F(2, 216) = 7.001$, $p = 0.001$). The two types of PPVs yielded a similar effects on the ease of imagination ($p = 0.947$).

The second criterion for mediation analysis requires the direct influence between the potential mediators on the dependent variables. As Table 2 indicates, ease of imagination positively affected attitude toward the product, purchase intentions, and attitude-intention consistency.

TABLE 2
Summary of Mediation Effects

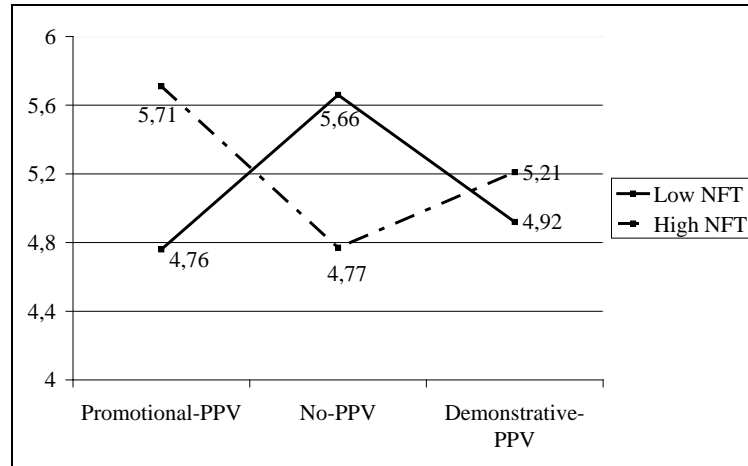
Dependent variable	Separate Analysis		Grouped Analysis	
	PPV	Ease of Imagination	PPV	Ease of Imagination
Attitude toward the product	0.213 (0.002)	0.602 (0.001)	0.095 (0.087)	0.583 (0.001)
Purchase Intention	0.197 (0.004)	0.508 (0.001)	0.088 (0.144)	0.488 (0.001)
Attitude-Intention Consistency	0.215 (0.001)	-0.246 (0.001)	0.210 (0.001)	-0.242 (0.001)

Finally, the third criterion for mediation effects (Baron and Kenny, 1986) establishes that the relationship between the independent variable and the dependent variable should be weakened when the mediator is introduced. In this way, the regression analyses revealed that ease of imagination mediated the relationship between the PPV conditions and the attitude toward the product, although the effect of PPV was marginally significant in the second regression. Moreover, the ease of imagination fully mediated the effects of the presence and type of PPV on participants' purchase intentions. However, when ease of imagination was included as a predictor in the relationship between PPV and attitude-intention consistency, the type of video still produced a strong impact on the consistency between attitude and purchase intentions. Therefore, we found support for hypothesis H4a and H4b, but the results point to a rejection of H4c.

5.3. Moderator Effects of Need for Touch

Participants were first divided into two groups according to a median split (Median = 5.0) and categorized as low ($M = 3.94$; $n = 111$) or high in NFT ($M = 5.78$; $n = 106$). The NFT groups and the PPV treatment were submitted to an analysis of variance with the preference for the purchase channel as dependent variable. The average preference of participants was higher for the physical channel than for the online channel ($M = 5.11$). The results of the ANOVA yielded no main effect for either the PPV condition ($F(2, 216) = 0.197$, $p = 0.821$) or NFT ($F(2, 216) = 0.223$, $p = 0.637$). However, a significant interaction effect between PPV and NFT emerged ($F(2, 216) = 0.070$, $p = 0.933$). The presence of a PPV on the online product presentation had different effect on low-NFT and high-NFT participants' preferences for the purchase channel. Specifically, for low-NFT participants, the presence of a PPV produced a higher preference for the online channel to carry out the purchase. In contrast, for high-NFT subjects, the mere presence of a PPV affected positively to their preferences for purchasing the product in the physical channel (see Figure 2). H5 was supported.

FIGURE 2
Interaction Effects between PPV and NFT on the Preference for the Purchase Channel



6. Discussion, Conclusions, and Implications

The present research takes the advantage of current development of information processing theories (Schwarz, 2004; Cohen and Reed, 2006; Petty, 2006) to adopt a metacognitive perspective to the study of vividness on online product presentations. Given the potential of vivid information to stimulate imagination, we consider the ease with which imaginative thoughts can be generated, as the underlying mechanism that may explain the effects of vivid information on consumers' attitudes and intention in a computer-mediated environment.

Overall, the findings of the experiment allow us to stress the importance of attending to how vivid information is presented to online users. The presentation of product videos in the online retail setting impacted on individuals' attitudes toward the product and purchase intentions, thus affecting the persuasiveness of the online product information. In addition, the results of the research contribute to current literature on vividness effects (Fortin and Dholakia, 2005; Petrova and Cialdini, 2005; Jiang and Benbasat, 2007), by including the ease of imagery elaboration as a potential mechanism to explain the effects of vividness in online settings.

Nevertheless, it should be noted that the characteristics of the audiovisual content may exert different effects on the evaluations of the product and behavioral intentions. Specifically, we found that a promotional-PPV, due to its great appealing and capacity to arouse consumers, produced better attitudes toward the product than less exciting presentations. However, displaying a realistic and objective product presentation video had a stronger influence on purchase intentions and individuals' consistency between their attitudes and intentions. Looking at the mediating effects of the ease of imagination, it seems that vivid information affects the ease with which individuals may envision how the product would be or picture consumption outcomes. If the individuals generate imaginations easily about the product in a realistic way, their behavioral intentions toward the product may be enhanced, as well as the consistency of attitudes and intentions, rather than appealing and abstract presentations.

Yet, promotional product presentations affected attitude toward the product in a greater extent than the other presentation formats, and this effect was partially mediated by the ease of imagination. More research is needed in order to further investigate how online users process the different types of vivid information that are available online to research products. In this way, it would be interesting to examine whether product presentations depicted in qualitatively different levels of vividness, may affect the nature of the thoughts that the consumer generates. This would allow for a better understanding of how the ease of imagine is incorporated to the formation of judgments and behavioral intentions. From a practical point of view, web product managers should take into account the different effects of product presentation videos on online users to develop strategies that lead them to effective purchases.

Moreover, this study considers the preference for the website or the brick-and-mortar as the channel to carry out the purchase. Consumer behavior research in online environments has often overlooked that

online consumers (and virtually multichannel consumers) may consider different channels during their purchase decisions. Depending on personal and situational characteristics, the processing of vivid information may appeal to different sub-decisions of the purchase process, regarding products, brands, and channels. In this way, the Need for Touch was introduced as a dispositional difference related to an increased interest for information related to the tactile aspects of the product and the purchase. Our findings indicate that this individual trait may affect the way that vivid information is presented on the computer screen. When vivid information is presented in the computer screen through audiovisual content, individuals high in need for touch may perceive a greater desire for the physic aspects of the purchase episode, and therefore lead them to prefer the brick-and-mortar setting to have a direct experience with the product. In contrast, displaying vivid information can also affect preferences for individuals low in need for touch. For these consumers, obtaining vivid information about the product might be sufficient to know about its experience attributes, or even they barely consider these aspects in their evaluation. Thus, their preference for purchasing the product in the online channel may be enhanced. These findings stress the importance of consumer characteristics for the development of effective multichannel marketing strategies, and open future research avenues with the aim of better understand how people are incorporating the Internet as an integrated part of their consumption behavior.

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