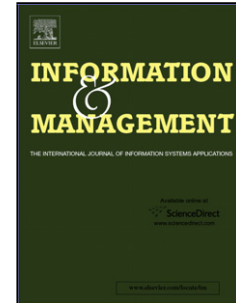# Accepted Manuscript

Title: Role of Local Presence in Online Impulse Buying

Authors: Charlotte Vonkeman, Tibert Verhagen, Willemijn van Dolen

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Title: Role of Local Presence in Online Impulse Buying

Charlotte Vonkeman, Vrije Universiteit Amsterdam

De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands, E: c.c.vonkeman@vu.nl

Tibert Verhagen, Amsterdam University of Applied Sciences

Wibautstraat 3b, 1091 GH Amsterdam, The Netherlands

Willemijn van Dolen, University of Amsterdam

Plantage Muidergracht 12, 1018TV Amsterdam, The Netherlands

Corresponding author: Charlotte Vonkeman, VU University Amsterdam, Faculty
Economics and Business Administration, Department Information, Logistics and
Innovation. Address: De Boelelaan 1081, 1081 HV Amsterdam, The Netherlands.
Tel: +31 20 59 82964. E-mail : c.c.vonkeman@vu.nl

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Highlights

- Perceptions of local presence increase when products are presented in a vivid and interactive manner in a web store

- Perceptions of local presence increase the urge to buy impulsively through increased product affect

- Although local presence reduces perceived product risk, product risk does not inhibit the urge to buy impulsively

Abstract

This paper proposes and tests a model to explain how consumers' perceptions of product presentation technologies may affect online impulse buying. Data from a laboratory experiment (N = 212), which were analyzed using a structural equation modeling approach, showed that vividness and interactivity of online product presentations increased the participants' perceptions of local presence, which refers to the sense of a product being present with a consumer in his or her own environment. Local presence, in turn, influenced the urge to buy impulsively by generating both cognitive (perceived risk) and affective (product affect) product responses. The implications of these results are discussed.

Key words

Impulse buying, online product presentation, local presence, vividness, interactivity

Role of Local Presence in Online Impulse Buying

1. Introduction

Following the increasing number of consumers who buy online impulsively [43], the academic community has started to adopt online impulse buying as a research topic. To date, most studies on this phenomenon have explored how online store elements presented to and perceived by visitors (e.g., website quality, variety of products selection, and recommender systems) influence impulse buying, thereby providing retailers with insight into how impulse buying may be stimulated at the online store level [22, 42, 43, 64, 70]. While the contributions of these studies are clear, they barely pay attention to how the presentation of products in e-commerce environments contributes to online impulse buying.

A consideration at the product presentation level is of interest for two reasons. First, impulse buying literature indicates that the presentation of and confrontation with products within a shopping environment often triggers impulsive purchases [22, 52]. Remarkably, previous empirical studies into the influence of online product presentations have mainly centered on rational buying processes [9, 12, 27], leaving their assumed effects on impulsive buying unaddressed. Second, the emergence of product presentation formats that emulate direct, unmediated product trial calls for attention to product presentation. Presentation formats such as 360 spin rotation applications, which permit consumers to rotate products and view them from different angles, and virtual mirrors, which allow consumers to try on products in a manner that closely resembles offline shopping settings, may give consumers the impression that a product is locally present with them. Given that previous research has indicated that "on the spot" product experiences drive impulse buying [52], an examination into the role of online product presentations seems worthwhile.

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This study aims to develop and validate a model relating consumers' perceptions of online product presentations to impulse buying. A key construct in this model is local presence, which refers to an individual's perceptions of physical objects presented online as actually being there in one's offline environment [65]. Specifically, two major issues are investigated. First, using the construal level theory [60], we study the mechanisms through which online product presentations convey a sense of local presence. In line with the work of Steuer [56] and Jiang and Benbasat [27], we identify vividness and interactivity as the mechanisms underlying online product presentations. Second, on the basis of the cognitive–affective framework [13], we investigate whether perceptions of local presence influence impulse buying through both cognitive and affective responses to products. With this approach, we aim to contribute to the growing body of literature on online impulse buying and the impact of web store information systems on consumers.

In the remainder of this paper, we first discuss of the literature that frames our research. Next, we develop our conceptual model and introduce the hypotheses. We then present the methodology and discuss our empirical results. Finally, we conclude with implications for theory and practice, a discussion of the limitations and suggestions for future research.

2. Conceptual background

2.1   Online impulse buying

In this paper, online impulse buying is defined as *an unplanned online purchase that is the result of exposure to a stimulus. The behavior is preceded by an urge to buy and tends to occur without thorough reflection.* The elements of this definition are firmly rooted in the existing literature on impulse buying in both the offline and online context.

Most scholars agree that a lack of planning is a necessary condition for a purchase to be classified as impulsive [38, 64]. Beatty and Ferrell [2] stated that impulse buying occurs *"with no pre-shopping intentions either to buy the specific product category or to fulfill a specific buying task"* (p.170). This implies that impulsive purchases are made on the spot, that is, within the shopping environment [64], and therefore highly driven by stimuli encountered within that shopping environment [52, 71]. Many scholars agree that the product itself can act as an activating stimulus [52], but other in-store stimuli (e.g., store lay out, atmospherics, point-of-purchase advertising) are also major triggers [38]. Such stimuli often elicit a sudden, powerful, and persistent urge to purchase something immediately [2], leaving consumers to feel temporarily out of control of their actions [67]. This urge to buy is likely to inhibit careful consideration and diminishes consumers' regard for the consequences of a purchase [67].

Because of the highly stimulus driven nature of impulse buying, web store environments are likely to play a pivotal role in seducing consumers to buy on impulse [22, 38, 73]. So far, a few empirical studies have focused on the general aspects of the online shopping environment as impulse buying triggers, showing that better overall website quality [42, 70], the availability of promotions and suggestions on a website [10], and beliefs about the functional and hedonic characteristics of a website [64] can increase online impulse buying. These studies, however, do not pay attention to the way products are presented to consumers. For instance, a study by Park et al. [43] included the concept of sensory product attributes as a determinant of online impulse buying, but because this concept is operationalized as the variety of color, sizes and styles of products offered on the site, it leaves the role of product presentation technologies on online impulse buying unaddressed.

2.2 Online product presentation

A major difference between offline and online shopping environments is that the latter does not allow consumers to touch, taste, or try products [27, 36]. This placed them at a disadvantage, as prior research concludes that direct product experiences (e.g., physical interactions with a product, product trial) are superior to indirect product experiences (e.g., exposure to mediated product information) in terms of persuasiveness and consumer learning [20]. Creating a satisfactory substitute for direct product experiences, by allowing consumers to assess products, their characteristics, and their performance prior to purchase, is therefore vital for online marketers [32].

To achieve this goal, online marketers can employ product presentation technologies [43, 46], which have significantly developed over the past two decades. Although more traditional presentation formats do exist, such as textual descriptions and static images remain prevalent on e-commerce websites, they fail to successfully convey the dynamic and tactile qualities of products [27, 39]. Therefore, richer presentation formats, including video, virtual product trial, and virtual mirrors, have been developed and are increasingly implemented in online shopping environments. The following sections discuss the mechanisms through which online product presentations may optimize indirect online product experiences [9, 27] and argue how these mechanisms may even help create an illusion of nonmediation.

2.2.1   *Optimizing the indirect online product experience: Interactivity and vividness*

Interactivity and vividness are widely recognized as mechanisms that determine consumers' perceptions of digital environments [5, 16, 36, 40, 56]. More specifically, they explain how online product presentations shape the way consumers perceive products [9, 27]. Interactivity refers to the experience that occurs when a consumer interacts with a mediated representation of a product on a website, and can be defined as "*the degree to which consumers perceive that a product presentation is two-way, controllable, and responsive to input*" [39] (p. 921). Vividness refers to "*consumers' perceptions of the breadth and depth of sensory dimensions and cues provided by the product presentation*" [16, 56].

Product presentation technologies provide varying levels of interactivity and vividness. For example, 360-spin rotation applications, virtual fitting rooms, and virtual mirrors allow consumers to have more control of the pace and exposure to

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information (i.e., interactivity), and provide richer sensory input through motion, audio and video files, etc. (i.e., vividness) than more traditional formats (i.e., pictures, text) do [9, 27]. According to prior research, such increased levels of vividness and interactivity are likely to diminish a consumers' perception of mediation by creating a sense of presence [16, 39, 56].

2.2.2 *Local presence*

In this study, the concept of presence is used to describe the degree to which an online product experience appears to be unmediated, rather than mediated. While many advances in research on presence have been made, the multitude of definitions of presence show that the concept is complex, applies to a set of diverse phenomena, and has many variants. Consequently, it is recommended to use a very explicit definition [37, 69]. To arrive at such a definition, we build upon the definition framework of presence by Waterworth et al. [69], which describes presence as a concept that provides the user with the illusion of nonmediation, is driven by external technological sensory cues, and is subjective in nature by focusing on the experience of the user. This description still is rather generic, however, and applies to multiple types of presence, including the regularly used telepresence, that is, the experience of "being there" (e.g., objects, oneself, others) in a computer-mediated environment [54] [39, 56]. While we do acknowledge the role of telepresence in creating online product experiences (also see [12, 32, 57]), we believe that recent developments in IT draw attention to another type of presence that focuses on different aspects of online product presentation (cf.[69]). In particular, we refer to the option of online product presentation formats to give consumers the impression that they, at least to some extent, experience the product as if it is real, that is, in the nonvirtual world. Thus,

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instead of presenting products online to create a realistic virtual reality [68], these online product presentations might (also) create an experience that brings the product to the environment of the consumer (cf. [17, 35]). This type of presence is what we refer to as local presence and is defined here as "*the observation of an individual experiencing physical things presented online (e.g., objects, activities, persons) as actually being there with him/her in one's offline environment*" [3, 54, 65].

There are multiple online product presentation formats that could elicit feelings of local presence. Traditional formats such as pictures and videos, for example, may serve as cues for consumers to construct a mental model and generate an internal representation of a product that is subsequently mapped onto an imaginary offline usage setting (cf. [7, 28]). Pictures and videos that contain people touching the product, focus on details of the texture of the product, or show the product in use may evoke tactile sensations in the mind of the consumer as if the product is actually there [41, 55]. Highly interactive and sensory-rich formats such as 360-spin rotation applications and virtual mirrors seem even more capable in generating local presence. Moreover, 360-spin applications allow consumers to manipulate a product on-screen to see it from any angle, which stimulates consumers' sense of touch [41] and provides them with an experience that mimics the inspection of a product in the real world [65]. Virtual mirrors provide consumers an experience that resembles actual product trial [6]. By creating an interactive, very realistic experience, virtual mirrors visually simulate that the product presented on the screen is actually "there" with the consumer [25].

Construal level theory (CLT) [60], which explains the relationship between psychological distance and construal levels, provides reasons to assume that local presence is of particular relevance when studying online impulse buying. It postulates

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that greater psychological distance between an object or event and the individual, whether it is caused by spatial distance, temporal distance, or hypothetical distance, will lead to a more abstract and high-level mental construal of that object or event. Psychological proximity, on the other hand, induces concrete and low-level construal of the object or event. Construal levels have been connected to self-regulation and impulsive behavior. Empirical studies by Ledgerwood and Trope [34] and Fujita et al. [18], for example, show that when high-level construals are activated, global, superordinate, and primary features of an object or event become more relevant, which directs attention to long-term goals and inhibits impulsive behavior. In contrast, when low-level construals are activated, attention is focused on local, subordinate, and secondary features of an object or event, making the "here and now" more salient, which leads to decreased self-control and an increase in impulsive behavior (e.g., [53]). Applied to the setting of our study, CLT may be used to explain how product presentations affect impulsive buying behavior through perceptions of local presence. In online stores, products are not just physically distant from the consumer's environment, they are also removed in terms of time as the consumer cannot directly access the product but has to wait for it to be shipped and delivered. This relatively large psychological distance between the consumer and the product is likely to activate high-level construals of the product and thus should inhibit impulsive behavior. Online product presentations may reduce psychological distance by increasing local presence; the higher the perceptions of local presence of a product, the smaller the psychological distance between the consumer and that product, and vice versa. Given the aforementioned links between psychological distance, construal levels, and impulsive behavior, we expect that increased local presence should activate low-level construals, which are expected to increase impulsive behavior.

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3.   Conceptual model and hypotheses
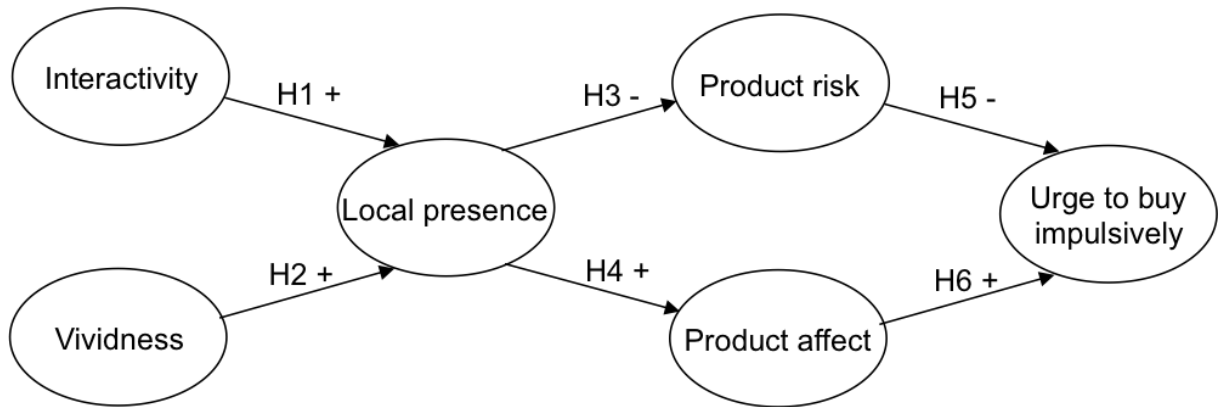
Figure 1: Conceptual model

In the following section, we elaborate on the constructs and the proposed interrelations in our conceptual model (see Figure 1). Interactivity and vividness are situated on the far left as perceptions generated by product presentation. In line with the previous literature on presence and virtual product experience, local presence is modeled as an effect of interactivity and vividness [16, 36, 56].

As consequences of local presence and antecedents of the urge to buy impulsively, the model includes both cognitive (product risk) and affective (product affect) response toward the product. Although prior literature emphasizes that impulse buying is mainly driven by emotions [31, 44, 66], we also include a cognitive factor for two reasons. First, numerous studies suggest that product presentations may trigger both cognitive and affective product reactions [9]. Second, recently several empirical studies have successfully linked cognitive factors, such as perceptions of website quality [42, 70] and online store beliefs [64], to online impulse buying.

The cognitive factor included in this study is perceived product risk, which refers to consumer's concerns about the quality and suitability of the product [15]. According to prior research (e.g., [11, 19, 72]), risk perceptions in online shopping situations may pertain to various aspects of the shopping process, such as financial matters (e.g., credit card security, being scammed) and matters of time and convenience (e.g., the time it takes to process a transaction). However, the present study focuses specifically on product risk as it is the risk dimension that aligns best with the product presentation context of our inquiry.

Product affect, defined as the extent to which a product has the potential to elicit a positive emotional response in consumers [33, 64], was included as the affective factor. The present study uses the urge to buy impulsively as a proxy for actual impulse buying. Theoretically, urge to buy is seen as a necessary precursor to the act of impulse buying [2], and this concept has been validated in several empirical studies [42, 70].

3.1 Effects of interactivity and vividness on local presence

Both perceived vividness and interactivity have been identified as the most important antecedents of different forms of presence in previous research [16, 36, 56]. High levels of interactivity are likely to create feelings of local presence for consumers through the availability of options to manipulate the product. Manipulating a product through a highly interactive computer interface generates immediate feedback, just like physically touching and trying a product would [9, 16, 27]. Therefore, the more interactive the product presentation is perceived to be, the more consumers are likely

to experience a perceptual illusion of the product being physically "there" with them.

Hence, we formulate the following hypothesis:

H1: Higher levels of interactivity will increase perceptions of local presence.

In highly vivid and unmediated physical environments, humans experience a natural sense of presence [56]. This means that the sensory experience is both rich (i.e., high sensory depth) and multisensory (i.e., high sensory breadth); we see someone's mouth move and at the same time we hear the words they speak. Such redundancy in sensory input increases perceptions of presence [56]. Thus, we can expect that when consumers perceive online product presentations as highly vivid, they are more likely to feel like the product is actually present with them. Thus, we hypothesize

H2: Higher levels of vividness will increase perceptions of local presence.

3.2 Effects of local presence on product risk and product affect

The Internet seems to increase the uncertainties inherent to purchase decisions [15]. Prior research consistently shows that consumers perceive higher levels of risk when purchasing online than when purchasing from brick-and-mortar stores [50]. This can be explained by the fact that it is much more difficult for consumers to accurately evaluate products online [65]. Because consumers cannot touch, try, and feel products through the mediated online channel, they may not be as certain that the product will perform as required or expected. If presented products are of reasonably good quality, higher levels of local presence may be expected to help reduce product risk because it reduces the barrier between the product and the consumer and thus creates a sense of nonmediation [56]. When a product is perceived as more physically present with a

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consumer, instead of just being present on the screen, consumers may be less likely to associate the product with negative consequences. Thus, we hypothesize

H3: Higher levels of perceived local presence will decrease perceptions of product risk.

Local presence may also generate affective responses, provided that the products presented are of good quality. It is well known that shopping often is a pleasurable activity for consumers [21]. In fact, consumers regularly shop to satisfy hedonic needs [4]. Physically interacting with products can generate a pleasurable shopping experience [46], which can result in more positive affective responses toward that product [45, 47]. However, the mediated nature of online shopping environments does not allow for such direct interactions. Prior research suggests that mediated and indirect product experiences elicit less positive emotional responses in consumers than direct and physical product experiences [65]. Local presence may be a way to overcome this problem. Experiencing a product in a locally present manner resembles actual product trial and is therefore likely to trigger positive affective responses toward the product. We therefore hypothesize the following:

H4: Higher levels of perceived local presence will increase perceptions of product affect.

3.3 Effects of risk and affect on the urge to buy

A large body of research shows that increased perceptions of risk associated with a product reduce the consumers' willingness to buy [57, 61]. This is not surprising because increased negative consequences associated with a product, and increased

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likelihood of these negative consequences occurring make the product less attractive to consumers. However, we do not yet know what role product risk plays in impulsive buying behavior. On the one hand, research shows that impulsive purchases are significantly driven by emotions and usually occur with diminished regard for consequences [31]. This would imply that product risk, which is a cognitive evaluation of a situation and its consequences, would play a marginal role in such behavior. On the other hand, empirical research indicates that impulse purchases are influenced by cognitive considerations, such as perceptions of website quality [42, 70] and online store beliefs [63]. Likewise, increased product risk perceptions may inhibit impulsivity and decreases the urge to buy on impulse. Because of the overwhelming evidence of the role of risk in online buying in general, combined with the empirical evidence regarding the role of cognition generated by available impulse buying studies, we follow the latter reasoning and expect that

H5: Higher levels of perceived product risk will decrease the urge to buy impulsively.

Impulse buying is inherently hedonically charged and emotion driven [21, 31] and mainly occurs when individuals experience strong positive emotions [42, 70]. The likelihood of a consumer experiencing an urge to buy impulsively is therefore expected to depend on the degree to which a consumer experiences a positive emotional response toward a product. This leads to the last hypothesis:

H6: Higher levels of perceived product affect will increase the urge to buy impulsively.

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4. Method and data collection

4.1 Study design and stimuli

The present study used a laboratory experiment to test how online product presentation affects online impulse buying. As the target website for this study, the site of the sunglasses brand Ray-Ban (www.Ray-Ban.com) was selected. Prior empirical studies have shown that fashion is a product category that is often bought on impulse [43, 64], which is why it was deemed an appropriate product category for the present study.

As the aim of this study was to examine impulsive rather than planned purchase behavior, it was necessary to ensure that participants did not have a predefined shopping goal when visiting the target website. Therefore, instead of telling participants the study was about purchase behavior in general, or impulsive buying in particular, they were told that they were participating in a study about the design and functionality of various websites. Accordingly, participants were instructed to browse the target website, using certain features to look at a selection of sunglasses. This assignment made no mention of selecting or purchasing anything while doing so. With this approach, we aimed to mimic browsing behavior more akin to window shopping than to planned purchase behavior. Any urge to buy that may have occurred during this browsing episode may thus be interpreted as impulsive rather than planned behavior.

The target website offered three different formats to view products: static pictures, a 360-spin rotation tool, or through a virtual mirror, which constituted our

three experimental conditions (see Appendix B for screen shots for each condition). Participants were randomly assigned to one of three formats. To assure that participants would not use another presentation format than the one they were assigned to, we set up computers in such a way that participants could only use the format they were assigned to. To control for confounding effects due to exposure to different sunglass models, we limited the number of models participants could see during their visit to the website to five pairs that were available in all three presentation formats and that were suitable for both women and men.

The pictures condition allowed participants to view the products on the site by looking at static pictures. In the 360-spin condition, participants could rotate the images of the glasses by clicking on the picture and dragging their mouse. In the virtual mirror conditions, participants could virtually try the different glasses through the webcam-based virtual mirror application on the website. In this condition, participants sat in front of a webcam, which showed video footage of their face on the screen. The virtual mirror application recognized the participant's facial features in the webcam footage and superimposed a selected pair of glasses over video footage of participants' face in real time. As such, participants could see what the glasses looked like on their own face in real time. The application allowed them to move their head to inspect the glasses from various angles. Configuration of this application was a seamless process that was guided by instructions given by the application.

The three different product presentation formats were used as experimental conditions because they were (a) representative of the range of presentation formats currently available in online retail practice and (b) capable of generating varying levels of vividness and interactivity. Prior research has shown that different product presentation formats elicit different levels of interactivity and vividness [26, 36, 39].

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For the former, we expected static pictures to elicit the lowest level of interactivity as they did not offer any active control over the visualization of a product. The 360-spin rotation tool allowed consumers to actively control the presentation on screen with the use of their mouse, and as such, this format was expected to generate higher levels of interactivity. The highest scores on interactivity were expected for the webcam-based virtual mirror as this presentation tool provides more realistic control over the display of the product (by means of head movement instead of through a mouse), as well as more complex and realistic feedback on the input than the 360-spin tool.

In line with prior research [16, 26, 56], we also expect the three product presentation formats to differ in levels of vividness, that is, they are expected to differ mainly in the depth (i.e., the quality of the sensory stimulation they provide). As still pictures only offer static visual input, this product presentation tool is expected to elicit the lowest level of vividness. Both the virtual mirror and the 360-spin rotation tool provide consumers with temporal visual information, but the quality of the sensory input from the virtual mirror tool is expected be of higher quality than the virtual mirror, and as such, the virtual mirror is expected to generate the highest levels of perceived vividness. Because we are interested in the effects of perceptions of vividness and interactivity, the analysis does not focus on these specific formats per se but rather uses them to generate variance in perceptions of vividness and interactivity.

In addition, the differences in product presentation, the lay out, and functionality of the website remained constant for all three conditions.

4.2   Sample

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A total of 212 participants participated in the laboratory experiment, which was conducted at a mid-sized university in the Netherlands. All participants were undergraduate students attending this university. Participation was voluntary. To increase the participation, students were awarded with course credits and one iPad mini was raffled among the participants. Of the participants, 62.7% (133) were male and 37.3% (79) were female. The average age was 19.8 years ($SD = 1.48$). Of the participants, 182 (85.9%) rated themselves as "moderately experienced," "experienced," or "very experienced" with online shopping, whereas 30 participants (14.1%) rated themselves as below average in terms of experience with online shopping. Most of the participants (208, 98.1%) knew the Ray-Ban sunglass brand prior to participating in the study.

4.3   Measurements

To measure consumer responses, we modified established measurement instruments that have been validated in prior studies. The constructs included were interactivity, vividness, local presence, product risk, product affect, and the urge to buy impulsively (see Figure 1). All items were measured on a seven-point Likert scale, ranging from 1 (= Strongly disagree) to 7 (= Strongly agree). The scale for interactivity ($M = 4.88$, $SD = 1.53$) consisted of two items and was adapted from research by Jiang and Benbasat [27], as was the scale for vividness ($M = 4.22$, $SD = 1.17$, four items). Because three product presentation formats were included in this study to generate variance in levels of perceived vividness and interactivity, we focused on the levels of vividness and interactivity within each of the three conditions. As expected, the static picture condition generated the lowest level of vividness ($M = 4.10$, $SD = 1.17$) and

interactivity (M = 3.93, SD = 1.33), followed by the 360-spin rotation condition (M = 4.21, SD = 1.25 for vividness, and M = 4.30, SD = 1.19 for interactivity). The highest levels of vividness and interactivity were reported within the virtual mirror condition (M = 5.23, SD = 1.02 for vividness and M = 5.34, SD = 0.99 for interactivity).

Local presence was measured with five items, adapted from research by Juan and Joele [29], Klein [32], and Verhagen et al. [65] (M = 2.94, SD = 1.27). Levels of local presence were highest for participants in the virtual mirror condition (M = 3.40, SD = 1.36), followed by the 360-spin condition (M = 2.88, SD = 1.14). Perceptions of local presence were the lowest in the static picture condition (M = 2.73, SD = 1.27). Product risk was measured with three items (M = 5.50, SD = 1.13) based on the work of Forsythe et al. [15]. The measurement for product affect consisted of four items, which were taken from Beatty and Ferrell, [2] and Laros and Steenkamp [33] (M = 3.87, SD = 1.22). Finally, the urge to buy impulsively was measured with three items based on the work of Parboteeah et al. [42] (M = 3.70, SD = 1.63). The original items were adapted to better fit the design of our study. The study by Parboteeah et al. was designed so that participants had to perform a specific shopping task (i.e., asked to buy a certain item), and their urge to impulsively buy a product *in addition* to this shopping task was measured as the target behavior, which was reflected in the items ("As I browsed this website, I had the urge to purchase items other than or in addition to my specific shopping goal," "Browsing this website, I had a desire to buy items that did not pertain to my specific shopping goal," and "While browsing this website, I had the inclination to purchase items outside my specific shopping goal"). However, in our study, because participants were not given a shopping, but a browsing task, we changed the items to "As I browsed this website, I had an inclination to purchase an item," "When I was at the website I had the desire to buy something," and "While

browsing the website I felt an urge to purchase an item."

Table 1 provides an overview of the items included for each of the research constructs. All measurements were based on a seven-point Likert scale, ranging from 1 (=strongly disagree) through 7 (=strongly agree), except for Product risk, which was measured on a seven-point semantic differential scale, ranging from 1 (=not risky at all) through 7 (=very risky) (see Appendix A for an overview of all measurements and items).

5. Data analysis and results

To test the effectiveness of the manipulations, ANOVAs were conducted using IBM SPSS 23. Next, the proposed model was tested using a two-step structural equation modeling approach in IBM SPSS AMOS 20.

5.1 Test of experimental manipulations

To test whether the manipulations had their intended effects, that is, to create an adequate variance in perceived vividness and interactivity, we performed three one-way ANOVAs. The first unifactor ANOVA analysis showed significant main effects of the three conditions on vividness ($F(2,209) = 25.84$, $p < 0.001$). A post hoc Tukey's test showed that the virtual mirror condition scored significantly higher on vividness ($M = 5.23$, $SD = 1.02$) than both the static picture condition ($M = 4.10$, $SD = 1.17$; $p < 0.001$) and the 360-spin condition ($M = 4.21$, $SD = 1.25$; $p < 0.001$) in the expected direction. However, the static picture and 360-spin conditions did not differ significantly ($p = 0.99$).

A second unifactor ANOVA also showed significant main effects of the three conditions on interactivity ($F(2,209) = 36.04$, $p <0.001$). A post hoc Tukey's test showed a significant difference between the virtual mirror condition ($M = 5.34$, $SD = 0.99$), the static picture condition ($M = 3.93$, $SD = 1.33$; $p <0.001$), and the 360-spin condition ($M = 4.30$, $SD = 1.19$; $p <0.001$) in the expected direction. The static picture and 360-spin conditions also differed significantly ($p <0.05$), with the 360-spin condition producing higher levels of interactivity than the static picture condition.

The last unifactor ANOVA showed a significant main effect on local presence ($F(2,209) = 5.52$, $p <0.01$). According to the post hoc Tukey's test, there was a significant difference between the virtual mirror condition ($M = 3.40$, $SD = 1.36$) both and the static picture condition ($M = 2.73$, $SD = 1.27$; $p <0.001$) and 360-spin condition ($M = 2.88$, $SD = 1.14$; $p <0.001$). However, the static picture and 360-spin conditions did not differ significantly ($p = 0.75$).

These analyses show that our manipulations were reasonably well able to elicit different levels of perceived vividness and interactivity in our sample.

5.2   *Test of measurement model*

To assess the adequacy of the measurement model, we conducted confirmatory factor analysis (CFA) using AMOS 20. The measurement model contained six latent constructs.

After an initial CFA analysis, one item for the measurement of vividness and one item for the measurement of local presence were dropped because they decreased the model fit. The CFA of the revised measurement model revealed fit indices approaching (AGFI= 0.89) or exceeding (CMIN= 173.23, df= 137, CMIN/df = 1.26;

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GFI = 0.92; AGFI = 0.89; NFI = 0.92; CFI = 0.98; TLI = 0.97; IFI = 0.98; RMSEA =

0.04) the acceptable values as formulated by Hu and Bentler ([23, 24] CMIN/df <

2.00; GFI, AGFI, NFI >0.90; CFI, TLI >0.95, RMSEA <.05;), CMIN= 173.23, df=

137, CMIN/df = 1.26; GFI = 0.92; AGFI = 0.89; NFI = 0.92; CFI = 0.98; TLI = 0.97;

IFI = 0.98; RMSEA = 0.04). Cronbach's alphas exceeded 0.70, indicating acceptable

reliability for each of the constructs (see Table 1). Convergent validity for all scales

was acceptable as the average variance extracted (AVE) exceeded 0.5 for all construct

(see Table 1). Discriminant validity was assessed by comparing the average variances

extracted (AVEs) with the squared cross construct correlations (see Table 1). All

AVEs were larger than the squared cross construct correlations, thereby showing

adequate discriminant validity [14]. A Harman's single-factor test was conducted to

test for common method bias. The single factor explained less than 50% of the

variance (31.74%), thus the absence of a common method bias was confirmed [48].

Table 1: AVEs versus squared cross construct correlations (N = 212)

	Interactivity	Vividness	Local Presence	Product Risk	Product Affect	Urge to buy
Interactivity	**0.81**					
Vividness	0.31	**0.68**				
Local presence	0.17	0.15	**0.72**			
Product risk	0.04	0.04	0.20	**0.63**		
Product affect	0.15	0.20	0.15	0.02	**0.70**	
Urge to buy	0.08	0.16	0.14	0.00	0.41	**0.90**

Note: The bold scores on the diagonal are the AVEs of the individual constructs. Off-diagonal values
are the squared correlations between the constructs

5.3 Test of structural model

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Next, the proposed structural model was tested using AMOS 20. Goodness-of-fit

statistics indicated an acceptable model fit (CMIN/df = 1.42; GFI = 0.91; AGFI =

0.89; NFI = 0.91; CFI = 0.97; TLI = 0.96; IFI = 0.97; RMSEA = 0.04). As is common

with larger sample sizes, the chi-square statistic was significant (CMIN= 205.58, df =

145). However, the χ^2 test is widely recognized to be problematic because it is

sensitive to sample size and violations of distributional assumptions. Fit indices less

susceptible to sampling characteristics showed the model fit to be adequate, with all

the fit indices approaching (AGFI = 0.88) or better than the cutoff values

recommended by Hu and Bentler [23, 24].

The structural model showed that all the hypotheses, except H5, were accepted

(see Table 2). As predicted, higher levels of vividness and interactivity significantly

increased the perceptions of local presence. In total, 22% of the variance in local

presence was explained by these factors. As expected, perceptions of local presence

decreased participants' perceived product risk (R^2 = 0.20) and increased their product

affect (R^2 = 0.19). Contrary to our expectations, product risk did not substantially

decrease the urge to buy impulsively. Product affect did increase the urge to buy

impulsively as expected. In total, 42% of the variance in the urge to buy was

explained.

Table 2: Hypothesis testing results (N = 212)

Hypothesis	Path	ß	Sign.
H1	Interactivity → Local presence	0.25	<0.01
H2	Vividness → Local presence	0.25	<0.05
H3	Local presence → Product risk	−0.45	<0.001
H4	Local presence → Product affect	0.43	<0.001
H5	Product risk → Urge to buy	0.03	n.s.
H6	Product affect → Urge to buy impulsively	0.66	<0.001

We performed additional analyses to further test whether the effect of local presence

was mediated by either perceived product risk or perceived product affect, using the method described by Baron and Kenny [1]. Cohen's F^2 was used to assess whether the amount of variance that was explained by the mediating effects was significant [8, 58, 59]. While local presence did significantly affect product risk (the mediating variable) and the urge to buy impulsively (the dependent variable), the lack of a significant effect of product risk on the urge to buy indicated that product risk did not mediate the effect of local presence on the urge to buy impulsively.

For product affect, a partial mediation effect was found. The effect of local presence on the urge to buy impulsively diminished significantly when the mediating variable product affect was added to the analysis, although a small direct effect of local presence on the urge to buy remained. The Cohen's F^2 showed that the increase in the amount of variance that was explained by the mediating effect (27%) was significant (Cohen 1988) (see Table 3 for an overview of the mediation tests).

Table 3: Mediation analyses

					IV+M→DV				R^2			
IV	M	DV	IV→DV	IV→M	IV	M	Mediation	IV+M →DV	IV →DV	ΔR^2	Cohen's F^2
LP	PR	UTB	0.33***	−0.37***	0.37**	0.10(ns)	None	0.34	0.33	−0.01	−0.02 (small)
LP	PA	UTB	0.33***	0.35***	0.15*	0.53***	Partial	0.60	0.33	0.27	0.68 (large)

Note 1: *Significant at the 0.05 level, ***Significant at the 0.001 level.
Note 2: LP = local presence; PR = product risk; PA = product affect; UTB = urge to buy impulsively.
Note 3: Mediating effects are tested by using the three-step method as suggested by Baron and Kenny (1986)
  Step 1: IV → DV is significant
  Step 2: IV → M is significant.
  Step 3: IV + M → DV: (a) If M is significant and IV is not significant, then M fully mediates the impact of IV on DV.
  (b) If both M and IV are significant, then M (partially) mediates the impact of IV on DV.
Note 4: Cohen's $F^2 = \Delta R^2_I/(1 - R^2_{IV+M})$.

6. Discussion and conclusions

With online impulse buying on the rise, understanding how such behavior is triggered is vital for both marketing professionals and researchers. By creating and testing a

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model that focuses on consumers' perceptions of online product presentations, the present study sheds light on the impact of an important web store characteristic that has not yet been addressed by previous studies, i.e., local presence. The results of our experimental study offer three main findings, the implications of which will be discussed below. First, the study is the first to apply the concept of local presence in the context of online impulse buying. The present study has placed the concept into a nomological network that is rooted in a theory on presence [56], the CLT [60], and the literature on impulse buying [64, 70], thereby creating a model that integrates these different streams of research. By focusing on local presence, as opposed to the more widely adopted concept of telepresence, the present study has demonstrated that vivid and interactive product presentations can seemingly transport products from the online shopping environment to the consumer. In the context of brick-and-mortar shopping, the importance of physical proximity to products has been shown to increase consumers' impulsivity [46]. The present study provides first evidence that in online shopping situations, a sense of local presence can produce similar effects. The relevance of the concept of local presence for practice is underscored by recent technological developments. For instance, IBM is working on an application that will allow consumers to feel different textures on their smartphone [51], and Disney is currently developing a touch screen that will allow users to touch virtual objects [62]. These examples clearly show that developers of product presentation technologies are eager to find ways to bridge the gap between virtual environments and the consumer.

Second, the results endorse the theory on impulse buying, which has suggested that in-store stimuli can be important drivers of impulsive behavior [52, 71], especially in online environments [38]. Because online shopping channels do not afford direct product experiences, consumers' perceptions of products are largely

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determined by the way the product is presented. The present study shows that a vivid and interactive product presentation can set in motion a process that influences consumers' emotional states and may result in higher levels of impulse buying and thus complements prior literature on online product presentation [27]. An implication for e-commerce practice is that online product presentations can be used as a marketing tool to induce consumers' impulsiveness. Online marketers would do well to not just look at product presentations per se but at the mechanisms underlying such technologies and look for product presentations that afford consumers an optimal product experience.

Third, the findings of the present study offer interesting insights regarding the relative impact of two cognitive and affective antecedents of online impulse buying. In line with conceptualizations of impulse buying literature, our results showed product affect as a strong mediator between the perceptions generated by product presentations and the urge to buy impulsively. Our study thus underlines the pivotal role of affect in the impulse buying process. However, the cognitive factor included in this study, i.e., product risk, failed to diminish the urge to buy. Prior research suggests that impulse buying is not influenced by cognitive deliberations [2] and occurs with a diminished regard for the consequences of such behavior [63], a view that the present study seems to confirm. Interestingly enough, the risks involved with products were not completely disregarded by participants: on average, risk perceptions were quite high. However, these cognitions failed to curb the participants' urge to buy. Thus, our study provides further evidence that emotion rather than cognition steers the impulse buying process, even in online shopping environments.

7. Limitations and future research

Some limitations of the present study should be addressed. First, the use of a student sample means generalizations to a wider population should be made with caution. However, we considered students to be a relevant target group for our study because the selected product represents a product category that students find important [49], which was confirmed in a pretest. Furthermore, the fact that a website from a real online retailer (as opposed to a website created for the purpose of the experiment) was used increases the external validity of the study. However, we do suggest future empirical study to cross-validate our findings with other samples.

The second limitation pertains to the scope of our research. Several of our hypothesized relations may hold mainly under conditions of high product quality, specifically the hypothesized positive relation between local presence and product affect and the negative relation between local presence and perceived product risk. These conditions were met in the present study as it focused on products from a well-known brand that is generally known to sell high-quality products. However, it seems plausible to assume that the magnitude of these relations may differ under the conditions of moderate or low product quality. It is likely that high local presence facilitates product comprehension (e.g., [27, 30]) and consumer learning [59]. Thus, when poor-quality products are presented in a locally present manner, their negative aspects may become more apparent to consumers. As such, product quality may be an important moderator for the effects of local presence, and future research should address this issue.

The third limitation concerns the lack of influence of product risk perceptions on the urge to buy impulsively. It could be debated that because of the laboratory setting of the present study and the lack of a real purchase situation, participants may

not have perceived the product under study to be risky. However, the average scores on the perceived product risk scale were above the scale average, which seems to indicate that the risks associated with the product were understood by participants. Although prior research confirms that the urge to buy precedes and accurately predicts impulse buying [70], it is possible that the urge to buy is not inhibited by risk perceptions, although the actual impulse purchase is. Future studies could therefore explore whether risk perceptions may in fact become influential during the final phase of the impulse buying process. Furthermore, participants' awareness of and experience with the lenient return policies e-tailers are required to offer consumers may have also have diminished the impact of risk perceptions on the urge to buy impulsively. Thus, more empirical research is needed to confirm the effects of risk perceptions on online impulse buying.

Future research could also address the relevance of the local presence concept for rational and planned purchase decisions. In rational purchase situations, increased local presence could facilitate consumers' understanding of products within online shopping environment, for example, by increasing perceived diagnosticity. Future research on more deliberate purchase behavior could therefore specifically focus on the cognitive factors that may underlie the effects of local presence, such as perceived diagnosticity [27].

Second, although this study used the CLT to explain how the psychological distance between a consumer and products presented online may be decreased by local presence and foster impulsive behavior, we did not measure psychological distance directly. Future studies could directly measure perceptions of psychological distance in various online shopping setting to further shed light on the applicability of

this concept for online marketing research and thus contribute to the growing body of literature on the CLT in marketing.

Another avenue for future research concerns the potential long-term consequences of impulse buying for both consumers and online retailers. Impulse buying has been theoretically linked to subsequent feelings of regret, guilt, and shame [74]. Such negative emotional consequences are obviously undesirable from a consumer welfare point of view, and they could also harm the relationship between consumer and company, for instance, by decreasing customer satisfaction and brand loyalty. Therefore, future research could investigate whether and how online impulse buying may generate emotional backlash effects.

Biographies

Charlotte Vonkeman is a PhD candidate at the Department of Information, Logistics and Innovation at VU University Amsterdam (Faculty of Economics and Business Administration). She studies how consumer behavior is influenced by marketers and by other consumers in online environments. Her work has been published in journals such as *Computers in Human Behavior, International Journal of Advertising,* and *Psychology & Health.*

Tibert Verhagen is an Associate Professor of E-business at the VU University Amsterdam (Faculty of Economics and Business Administration) in the Netherlands. He has a PhD in online consumer behavior. His research interests include the influence of emerging forms of IT on online consumer decision-making, online marketing, and research methodology. His work has been published in journals such as *European Journal of Information Systems*, *Information & Management*, *Computers in Human Behavior*, *Journal of Computer-Mediated Communication*, *New Media & Society*, and *International Journal of Information Management*.

Willemijn van Dolen is a full-time Professor of Marketing at the University of Amsterdam. She received her PhD from Maastricht University and spent 2 years as a visiting researcher at the Haas School of Business, University of California, Berkeley. Her research interests include social media and social influence. She is a member of several advisory boards and of the supervisory board of Amsterdam Marketing (the city marketing organization of the Amsterdam Metropolitan Area). She also conducts research for the Dutch Child helpline and is chair of the Research, Advisory and Policy council of Child Helplines International, an organization dedicated to the protection of children around the world. She has published extensively in professional journals such as the *Journal of Retailing, Information & Management*, *Journal of Business Research, Journal of Business Ethics, Journal of Service Research, Child Abuse & Neglect, California Management Review, Journal of Computer Mediated Communication* and *Psychology & Marketing*.

Appendix A: Measurements scales

Constructs and indicators	Cronbach's alpha
Interactivity (I)	0.76
I1: I am able to interact with this product	
I2: The product can respond to my input on this Web interface	
Vividness (V)	0.76
V1: The product presentation on this website is animated	
V2: The product demonstration on this website is lively	
V3: I can acquire product information on this website from different sensory channels*	
V4: This website contains product information exciting to the senses	
Local Presence (LP)	0.85
LP1: Experiencing sunglasses on the website is like experiencing sunglasses in the real world*	
LP2: Experiencing sunglasses on the website corresponds with my memories of experiencing sunglasses in reality	
LP3: The products on the website seemed "real" rather than "virtual"	
LP4: During my experience on the website the product seemed to me "something in reality" rather than "something in a virtual environment"	
LP5: While I was on the website, the products were as present to me as in the "real world"	
Product Risk (PR)	0.71
PR1: How risky do you think it is that you cannot try the sunglasses before you make a purchase?	
PR2: How risky do you think it is that you cannot touch or feel the sunglasses before you make a purchase?	
PR3: How risky do you think it is that you cannot estimate the size of the sunglasses before you make a purchase?	
Product Affect (PA)	0.85

PA1: I felt enthusiasm toward the sunglasses
PA2: I felt proud toward the sunglasses
PA3: I felt excited toward the sunglasses
PA4: I felt inspired toward the sunglasses

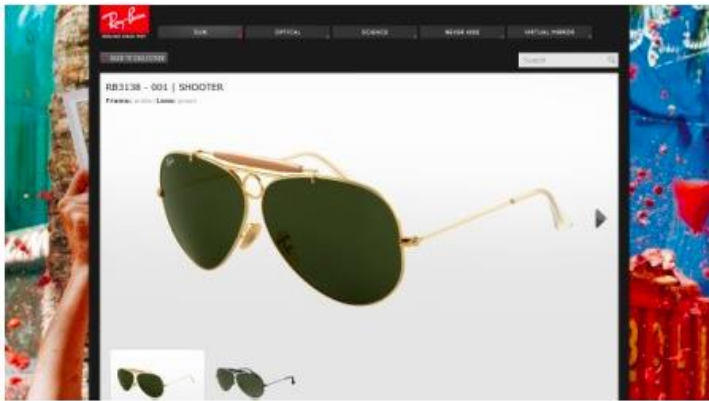Urge to Buy (UB)   0.92
UB1: As I browsed this website, I had an inclination to purchase an item
UB2: When I was at the website, I had the desire to buy something
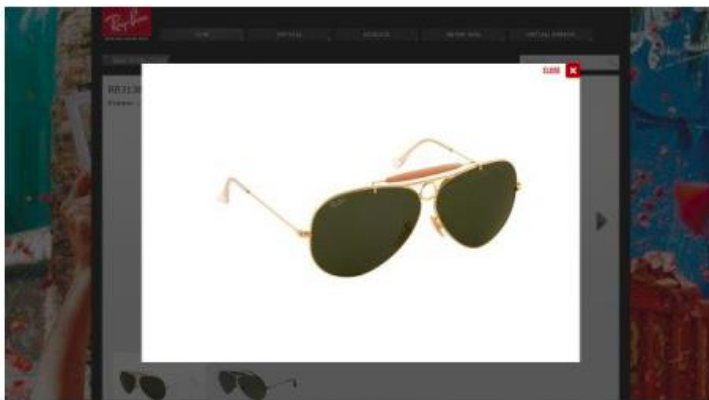UB3: When I was at the website, I felt an urge to purchase an item

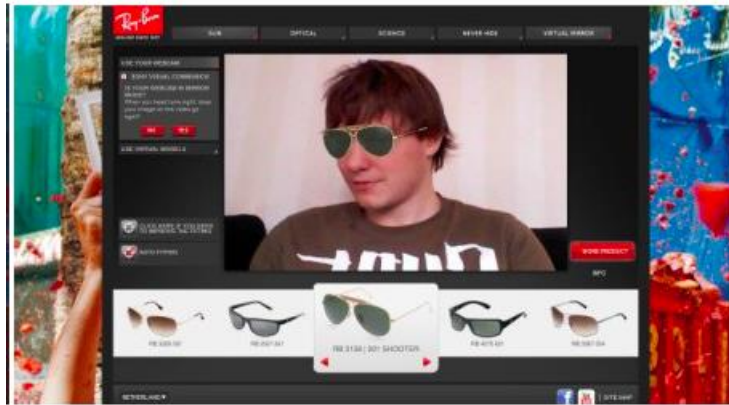*Note*: *Items excluded from further analyses because they deteriorated the model fit.

Appendix B: Screenshots of the three experimental conditions

Condition 1: Static image

Condition 2: 360-spin rotation

Condition 3: Virtual mirror

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