I Want to Pay more But I Don't Remember What You Just Said: Augmented Reality Effects on Attitude, Willingness to Pay and Memory Recall

Abstract

Through Augmented Reality (AR) apps on smartphones, many products are bringing information and entertainment to their consumers in its packaging. With AR technology, virtual elements are superimposed on the real world, allowing the reality to expand and add images, sounds, and animations. Despite having numerous applications and advantages for the success of marketing activities already documented by previous studies, little is known about the underlying mechanisms on the effect of AR on consumer's attitudes toward the brand, willingness to pay, and memory recall. In two experiments, we empirically demonstrate that while a positive attitude toward the brand and willingness to pay increases, memory recall decreases when consumers are exposed to AR media campaign compared to a traditional video campaign. The perception of the media's innovation and entertainment mediate the effect of AR on attitude toward the brand. Moreover, when the product is perceived as already new, there is no difference between the type of media. Thus, the novelty perception of the AR media, which contributes to its positives results on consumers has no effect when the product is already perceived as new.

Key Words: Augmented Reality, Attitude toward the Brand, Willingness to Pay, Memory Recall, Novelty.

INTRODUCTION

Imagine that you are at the supermarket and, by pointing your smartphone at a tomato sauce can, you can see on your screen how to prepare a new recipe for dinner. Or imagine that you have arrived at your home and realize that you need to change your sofa for a bigger one. It is just pointing the camera of your smartphone to your living room, and you can select, virtually add and dimension various models of sofas until you choose one that matches your decor. These are just two practical examples in the face of all other possibilities that already exist using Augmented Reality (AR) technology. The AR Heinz app allows consumers to access new recipes just by pointing it to the products, and the AR IKEA app enables consumers to test their new furniture at home in a much easier way (and lighter) – they use the "Try before to buy" slogan. Increasingly, new technologies have shown as important tools to attract new or increase the share of volume from existing shoppers, given technology's effect on shopper perceptions about the retailer and this effect on individuals' behavioral intentions (Inman & Nikolova, 2017).

Augmented Reality is the practice of displaying digital information over people's real-time view of objects, people, or spaces in the physical world (Scholz & Smith, 2016), differently from Virtual Reality (VR) that immerses the user entirely within a non-real environment (Azuma, 1997). Both technologies require equipment for their content to be accessed. Because AR is easily available on smartphones, it is becoming a mainstream technology in the market. Moreover, many companies are providing tools for developing AR content for all kinds of businesses – for example, Instagram and Facebook's lenses and filters, Google's ARCore, and Apple's ARKit. Such platforms have further accelerated the development of AR content and consumer experiences (eMarketer, 2018). Experts predict that commercial spending for AR and VR will surpass consumer spending for these technologies by 2020 and grow to a projected $80-billion market by 2025 (Forbes, 2019).

Previous studies of the AR application for commercial purposes indicate that the use of such technology can have positive responses. For example, it can improve customers' shopping experiences by providing it more interactive and fun aspects; increase engagement with brands; positively influence attitudes toward ads; and increase sales (Pantano & Servidio, 2012; Scholz & Smith, 2016; Yang, (Pantano & Servidio, 2012; Scholz & Smith, 2016; Yang, Carlson, & Chen, 2020; Yaoyuneyong, Foster, Johnson, & Johnson, 2016; Carlson, & Chen, 2020). Although there are significant advances in studies regarding the effects of AR and marketing managers can leverage AR technology to craft creatives and immersive brand experiences, little is known about the underlying mechanisms on the effect of AR on the consumers' responses. Furthermore, the negative effects of AR technology are still unknown. In this study, we address these gaps by initially developing two studies to empirically assess the effect of AR on consumer's attitudes, willingness to pay, and memory recall. Based on previous AR previous literature which highlights several positive effects involving the application of RA in the commercial context, we posit that individuals have a more positive attitude toward the brand and are willing to pay more for a product when they watch it advertised in AR media (vs. traditional video media). Also, we predict that this effect is driven by the perception of innovation and entertainment in the media. Consistently with attention capacity theories, we also predict that consumers will recall less information when it is presented by AR technology.

This study makes several contributions to the literature and practice. First, we empirically contribute to the literature construction on AR effects on consumer judgment and behavior. More specifically, our results amplify finding by providing insights about the psychological mechanisms behind the AR positive results already verified. Secondly, we contribute by offering evidence on when AR technology applied to the commercial context will have negative effects on consumer-brand relations. Also, showing when positive effects of AR on attitude toward the brand will be annulate. Thirdly, our results can help agencies, managers, retailers, and industries to use AR technology most efficiently to achieve their communication goals since they can choose the best type of media for each campaign content. And finally, unlike prior work, which has mostly considered AR effects on the e-commerce context, we explore its effect on physical context.

In the next section, we review the literature related to AR technology implications to the commercial area and introduce our predictions. Following, we explain how we tested our predictions using two experimental studies. We then discuss our results and conclude with the theoretical and managerial implications.

THEORETICAL BACKGROUND

Augmented Reality

Augmented Reality (AR) is a computer-simulated interactive technology that displays digital information over individuals' real-time views of objects, people, or spaces in the physical world (Azuma, 1997; Scholz & Smith, 2016). With the use of virtually generated content, AR combines objects from the virtual and the real environment, recorded in 3D (Carmigniani & Furht, 2011). There are currently numerous applications for this technology, involving areas such as health, education, tourism, industrial production, and, mainly, entertainment. In the commercial area, consumer-driven companies leverage AR technology to enrich their customers' shopping experiences and increase engagement with their brands to ultimately increase sales (Yang et al., 2020).

One retailing application of AR technology is AR Try-Ons. As already described in the IKEA app case, this application allows users to test products virtually in their environment or even in their bodies. For instance, Sephora offers consumers the AR technology on its stores and e-commerce, which makes available to test all its products virtually right on consumers'

faces. Also, AR Try-Ons technologies are being used on called “magical mirrors” or “virtual fitting rooms”, that are big screens on stores where consumers can choose clothes and see themselves on it by just moving a finger.

Another retailing application of AR technology is the product packaging-consumer interaction. Increasingly, companies have utilized AR technology to create interactive packaging and improve customers’ retail experiences (Scholz & Smith, 2016). As already described in the Heinz app case, other companies are also offering virtual content to their products, such as nutrition information, recipes, ingredients’ origins, production chain, etc. For example, in Australia McDonald’s allows consumers to find the farms which produce its beef, chicken, and vegetables by using AR technology (named *McDonald’s Track My Macca’s app*) through their hamburger packaging. However, it is not just informative content that is in this application, as there is also entertainment content, such as games and animations. For instance, in 2019, Coke launched a partnership-campaign with Marvel Studios to promote the movie Avengers. In this campaign, consumers downloaded a Coke app and, by pointing the smartphone’s camera at the Coke can, an animation of the movie appeared on the smartphone’ screen. As a result, Coke’s can was transformed into a movie’s character.

Augmented Reality and individuals’ responses

The existing Augmented Reality literature has worked with three major focuses: *1) exploring consumer acceptance of AR technology* (Pantano, Rese, & Baier, 2017; Rese, Baier, Geyer-Schulz, & Schreiber, 2017; Roy, Balaji, Quazi, & Quaddus, 2018); *2) investigating the employ of the AR technology by retailers* (Dacko, 2017; Scholz & Duffy, 2018); and *3) examining the effects of AR technology on consumers’ responses* (Hilken, de Ruyter, Chylinski, Mahr, & Keeling, 2017; Javornik, 2016; Yim, Chu, & Sauer, 2017). The present work also focuses on examining the effects of AR technology on consumers’ responses. More specifically, we are interested in examining consumers’ responses, such as attitude, willingness to pay, and memory recall.

Previous works on uses of AR technology for commercial purposes have shown many positive results on consumers’ responses, such as attitude. For instance, some have suggested that AR advertising positively influences attitudes toward advertising (Yang et al., 2020; Yaoyuneyong et al., 2016). Comparing AR advertising to traditional video advertising, Yang et al. (2020) demonstrate that AR ads are more effective in influencing consumers’ attitudes toward the ad. Also, they offer evidence that while this effect is mediated by consumers’ curiosity and attention toward the ad, the effect happens only for individuals who are not familiar with AR ad technology.

In the same way, comparing AR product presentation to web-based product presentation, Yim, Chu, and Sauer (2017) showed that AR provides effective communication benefits by generating greater novelty, immersion, enjoyment, and usefulness, which resulted in positive attitudes toward media and purchase intention. Moreover, in the tourism context, He, Wu, and Li (2018) showed positive effects of AR design elements on the museum tourism experience. When the virtual presence is high, the virtual environment can function as a contextual cue that facilitates consumers’ mental imagery, which enhances the aesthetic experience, thereby increasing visitors’ willingness to pay more for the experience.

The positive effects of the use of AR are also observed in the consumer buying journey, which has been considerably influenced by the insertion of interactive technologies (Yadav & Pavlou, 2014). For instance, AR increases consumer involvement by providing a more interactive and fun shopping experience and bringing the in-store experience to their homes (Pantano & Servidio, 2012). Similarly, Park and Yoo's (2020) findings reveal that consumers who perceive controllability and playfulness experience greater elaboration and quality of mental imagery after shopping with AR, which, in turn, positively affects consumers’ attitudes

toward a product and their behavioral intentions. Likewise, studies in the online retail field showed that AR-enabled interaction positively influences customers' utilitarian and hedonic value perceptions of the online service experience (Hilken et al., 2017). In this sense, Javornik's (2016) work confirms that consumers become more immersed in the online purchase flow when perceiving the visual augmentation to be more intense. That is, results showed that the AR app had positive effects on the intention to engage with the AR app again in the future and positive effects on the attitude towards the shopping app.

The rich media displays in AR presumably be one of the factors to increase excitement regarding the shopping experience. Hence, the consumers' higher perceived value of the consumption or usage experience might also influence consumer willingness (Shor & Oliver, 2006). Previous studies suggested that rich media could influence the amount of money customers are willing to pay, and this effect is higher for experience products when an interaction is possible (Li & Meshkova, 2013). Accordingly, as pointed out earlier, He et al. (2018), also in an experiential context, has documented substantial evidence for AR elements influence on visitors' willingness to pay. To the best of our knowledge, no studies have so far investigated the effect of AR design elements applied to material product promotional content on willingness to pay.

Thus, consistent with the AR literature that points to the positive effects of AR on consumers' responses, we predict that the use of AR as a media for product campaigns will result in higher attitude towards the brand and higher willingness to pay for the product compared to the use of traditional media such as video. Formally, we present the following hypotheses:

H_1: Individuals have a more positive attitude toward the brand in AR campaigns compared to Video campaigns.

H_2: Individuals are willing to pay more for a product promoted via AR campaigns compared to Video campaigns.

In order to extend our investigation, drawing from the studies that assessed the Technology Acceptance Model (TAM: Davis, 1989) in AR contexts, we predict that H_1 expected effect is explained by the perception of entertainment during consumer exposition to the campaign (Haugstvedt & Krogstie, 2012; Wojciechowski & Cellary, 2013). Additionally, is well established that 3D computer graphics technologies and innovative elements are more efficient in attracting consumers' attention (Hsieh, Hsieh, & Tang, 2012; Lee & Chung, 2008). Thus, seems reasonable to expect that the perception of the media innovativeness would also help to explain individuals' responses. This lead to the following hypotheses:

H_3: The H_1 effect is mediated by the perception of innovativeness and entertainment.

Augmented Reality influence on Memory Recall

During a purchase, individuals can base their decision on the stimuli, on memory, and on both stimuli and memory simultaneously (Adaval & Wyer, 2011; Srull & Wyer, 1989; Wyer & Srull, 1986; Xu & Wyer, 2010). The judgment usually requires the collection, evaluation, and integration of multiple information that is sometimes inferred by stimulus situationally available or retrieved from memory (Lynch & Srull, 1982; Srull & Wyer, 1989). Recent results have shown that subjective memory experiences guide decision making independently of objective accuracy (Hembacher & Ghetti, 2017), and individuals decide which memories to rely on based on the subjective qualities of those memories (Hembacher & Ghetti, 2013; Sanbonmatsu, Kardes, & Sansone, 1991).

Although there are no specific studies on the relationship between augmented reality and memory – as far as we know – some studies address the theme through the concept of attention. Menon and Soman (2002), for example, found that curiosity prompts consumers to seek information, given that curiosity increases the time spent and attention devoted to specific information. In that same sense, as we discussed earlier, Yang et al. (2020) showed that because the use of AR advertising arouses more curiosity on consumers, which, consequently, arouses more attention, the attitude towards the advertising increases.

However, according to attention capacity theories, if another task captures individuals' attention, they have less information capacity remaining to allocate to another task (Cowan et al., 2005; Unsworth & Robison, 2016). Héroux, Laroch, and McGown (1988) investigated situational factors on the quantity and content of information recalled from product labels. Although the authors did not find a direct effect of distraction, they suggested that the relationship between distraction and amount of label information or time pressure warrants further research. In a related vein, Choi, Lee, and Li (2013) found that distraction inhibits retrieval of implicit brand memory and the sensory distractions were more pronounced for familiar brands, probably because relatively less attention enhances the interference on implicit memory. Novel unfamiliar brands, conversely, seems to attract more attention and sensory distraction had no effect on information retrieval.

In fact, working memory can be easily overloaded by sensory input (Baddeley, 2010) such as 3D images from Augmented Reality. Aligned to that, Grewal et al. (2018) showed that individuals' deviation attention, such as that induced by mobile phone use in-store, increase customer purchases by diverting shoppers and a so-called distraction-based mechanism. That is, the use of mobile phone in-store ultimately increases consumers' purchases because they spend more time in the store, examining products and prices on shelves. Thus, based on attention capacity theories, we predict that exposure to AR media may generate information overload on individuals who, consequently, will have less capacity to memorize the information presented. Formally, we present the following hypothesis:

H_4: Individuals recall lees information from AR campaigns compared to Video campaigns.

Augmented Reality as a Novel Innovation

Despite not being a new technology, AR is still associated with novelty, and its use and application in the market have been expanding in recent years. For instance, by comparing two advertising, Yaoyuneyong et al. (2016) showed that the AR ad provides higher perceptions of novelty and that it is one factor for the positive rated of AR ads compared to traditional ads. Similarly, previous work suggests that because consumers perceive AR ads as novel and engaging, the use of AR is likely to have a positive impact on attitude toward the ad (Sheinin, Varki, & Ashley, 2011). In this sense, Yim et al. (2017) suggest that all the benefits of AR (attitude toward media and purchase intention) partly come from consumers' perceptions of its newness and uniqueness, thereby producing a significant novelty effect. Their results revealed that AR-based product presentations are generally superior in media novelty, immersion, media enjoyment, usefulness, attitude toward media, and purchase intention compared to traditional web-based product presentations.

Based on previous studies, we assume that being something new is a current feature of AR technology that attributes positive effects to it, particularly related to a higher attitude and to a willingness to pay more. Therefore, we predict that when the novelty dimension is no longer relevant to the product evaluation (e.g. if the product is already new), the positive effect of AR on the product will no longer be verified. In other words:

H5: There is no difference in AR and Video evaluations when the campaign is promoting a new product, compared to a unnew product.

We tested our hypotheses via two lab experiments embracing two real products and AR campaigns. Study 1 demonstrates that an AR media increases consumers' perception of innovativeness and entertaining on the products' campaign, which mediates a positive effect on subsequent brand attitude. Moreover, Study 1 demonstrates that an AR media increases consumers' willingness to pay for a product but decreases memory recall about its information. In addition, Study 2 demonstrates that when a product is already perceived as new, augmented reality media is perceive as less innovative and its positive effect on attitude toward the brand, compared to a video media, is eliminated.

STUDY 1

The purpose of study 1 was to examine the main effect of the type of media (augmented reality vs. video) on individuals' attitudes toward the brand, willingness to pay, and memory recall. Furthermore, we examined whether an AR media would increases perceived innovativeness and entertaining, and positively influence attitude toward the brand.

Participants and Design

Seventy-two undergraduate students (65% male, M_{age} = 20.4) participated in a laboratory experiment for small prizes. They were randomly assigned to either one of two different conditions (see Appendix A). We emphasize that both the AR stimulus and the video were created exclusively for this study in partnership with a company that develops AR technologies. The study had a two-level single factor (Media type: augmented reality vs. video) between-subjects design. All participants were told that they would take part in a study about a new toast's brand marketing campaign and that was it developed using either an AR technology or video. The ethical review committee of the School approved the procedure and materials.

Procedures

Participants were invited to a computer lab to evaluate a new toast marketing campaign. We posited a product package next to each computer. Individuals in both conditions received a smartphone and were asked to open the AR application (or to play the video) to watch the campaign. The campaign animation consists of images of ingredients (gorgonzola, heavy cream, nuts, and basil) from a recipe for gorgonzola pate falling into a bowl and ending with a recipe book opening to present the ingredients. Next, they returned the smartphone to a research assistant and were asked to answer some questions on the computer to access their attitude toward the brand, willingness to pay the product, memory recall about the campaign's information, and attention check. We also measured whether innovative and entertaining the campaign was (measured by the following questions: "The campaign is innovative" and "The campaign is entertaining" on a 7-point scale ranging from 1, strongly disagree to 7, strongly agree). All questions were displayed in a randomized order.

Measurements

Attitude toward the brand. Participants responded to the following question: "The campaign made me see the brand ADRIA in a positive light." measured on a 7-point scale ranging from 1, strongly disagree to 7, strongly agree.

Willingness to pay. Participants responded to the following open questions: "How much would you pay for this package of Adria toast?"

Memory recall. Participants responded to the questions: "Which of the following ingredients were part of the recipe that was displayed? You can tick more than one alternative

among the following: gorgonzola, basil, heavy cream, nuts, mozzarella, ricotta, chestnut, and chive." Among the eight ingredients presented, only four were correct.

Attention check. To check if participants paid attention to the campaign media, they responded to the following question: "What type of media have you watched: augmented reality, video, or newspaper?"

Results

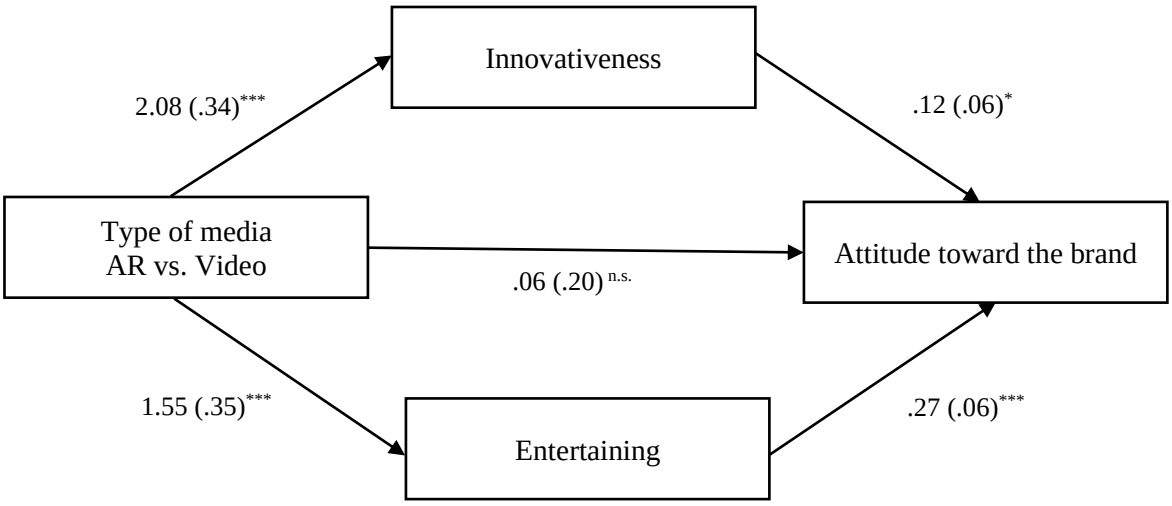
Attention check. One participant (1.39%) failed an attention check question, leaving 71 subjects available for analysis (64.8% male, M_{age} = 20.4; *SD* = 2.52).

Attitude toward the brand. An independent sample t-test reveals a significant result which indicates that for participants exposed to the AR media campaign, the attitude toward the brand was higher (M_{AR} = 5.63, *SD* = 1.03) than to the video campaign (M_{video} = 4.72, *SD* = 1.32, t(69) = -3.214, *p* = .002).

Willingness to pay. An independent sample t-test reveals a marginally significant result which indicates that individuals in the AR media condition were willing to pay more for the toast packet (M_{AR} = 5.72 Brazilian real; *SD* = 2.76) than individuals in the video media condition (M_{video} = 4.66 Brazilian real, *SD* = 1.80, *t*(69) = -1.909, *p* = .06).

Memory. An independent sample t-test reveals a significant result which indicates that individuals in AR media condition (M_{AR} = 2,82, *SD* = .82) recalled less information about the recipe than individuals in the video condition (M_{video} = 3.25; *SD* = .73, *t*(69) = 2.283, *p* = .026).

Mediation analysis. A bootstrapping procedure (Model 4; Hayes, 2013), specifying a confidence interval of 95% with 5,000 resamples, indicated the total indirect effect of innovativeness and entertaining on attitude toward the brand with a confidence interval excluding zero (indirect effect =.8630; CI[.3539, 1.5528]) (see Figure 1).



NOTES: *p <.05, **p <.01, ***p <.001, n.s.= not significant.

Fig. 1 Mediation analysis showing the effect of type of media on attitude toward the brand via innovativeness and entertaining in Study 1.

Discussion

As expected, our results indicate that the use of the AR media has positive influences on attitude toward the brand and willingness to pay. Also, our results show that the effect of the type of media on the attitude toward the brand is fully mediated by the perceived innovativeness and entertainment of the media campaign. Consistent with previous research, the richer visual

effects in the AR campaign seems to impact consumers' attitude (Hsieh et al., 2012). More interactive and fun aspects of the AR content, compared to the video, positively influenced attitudes toward the brand (Pantano & Servidio, 2012; Scholz & Smith, 2016; Yang et al., 2020; Yaoyuneyong et al., 2016).

However, the use of the AR media had negative effects on memory recall. Consistent with attention capacity theories, being exposed to AR captured individuals' attention in such a way that they had less information remaining (Cowan et al., 2005; Unsworth & Robison, 2016). This distraction effect elicited by the media enjoyment and innovativeness effect may have conflicts results for the marketers. On one hand, it seems to lead to better general evaluations, on the other hand, it includes the possibility of information overload when assessing product' attributes. For consumers, this is particularly important because decisions made without knowledge of important attributes can lead to sub-optimal choices.

STUDY 2

The purpose of Study 2 was to examine whether the perception of novelty on the product moderates the effect of the type of media (augmented reality vs. video) on the attitude toward the brand, willingness to pay, and memory recall about media content. More specifically, we examined whether the level of novelty of the product would decrease the positive effect of the augmented reality media on the attitude toward the brand and willingness to pay. Furthermore, Study 2 intended to investigate whether the perception of novelty on the product would decrease perceived innovativeness on augmented reality media, and consequently, eliminate the higher positive effect of augmented reality on attitude toward the brand compared to a video campaign.

Participants and Design

Two hundred and six undergraduate students (66.8% female, M_{age}= 21) participated in a laboratory experiment for small prizes. They were randomly assigned to one of four conditions (see Appendix B). This study followed a two (media type: augmented reality vs. video) by two (novelty: present vs. absent) between-subjects design. All participants were told that they would take part in a study about an orange juice market. As in the previous study, both the AR stimulus and the video were created exclusively for this study in partnership with the IT department of the School. Also, the procedure and materials were approved by the ethical review committee of the School.

Procedure

Participants were invited to a computer lab to evaluate the brand "dobem" orange juice marketing campaign. Individuals in all conditions received an orange juice box and a smartphone next to each computer. They were presented to a visual banner campaign on a computer screen which informed about the presence of novelty (or absent) of the product. Next, they were asked to open the AR application (or to play the video) to watch the campaign. The animation of the campaign consists of opening the juice box, followed by internal images of trees and oranges moving to the sound of music and ending with messages about product features. In sequence, as Study 1, they were asked to answer some questions on the computer to access their attitude toward the brand, willingness to pay the product, memory recall about the campaign's information, attention check, and manipulation check. We also measured whether innovative the campaign was using the same question as Study 1 (measured on a 7-point scale ranging from 1, strongly disagree to 7, strongly agree). All questions were displayed in a randomized order.

Measurements

Attitude toward the brand. Participants responded to the following question: "The campaign made me see the brand dobem in a positive light." measured on a 7-point scale ranging from 1, strongly disagree to 7, strongly agree.

Willingness to pay. Participants responded to the following open questions: "How much would you pay for this dobem orange juice box?"

Memory recall. Participants responded to the questions: "The campaign animation showed four characteristics of dobem orange juice. Check these four characteristics among the following options: native fruits, multivitamins, natural, dried fruits, without added sugar, without preservatives, organic, vitamin C."

Attention and Manipulation check. To check if participants paid attention to the campaign media, they responded to the following question: "What type of media have you watched: augmented reality, video, magazine, radio, or social media?". To check if participants perceived novelty on the product after the manipulation through the visual banner campaign, they responded to the following question: "How new is this product on the market?".

Results

Attention check and Manipulation check. Twenty participants (9,70%) failed an attention check question, leaving 186 subjects available for analysis (55.9% female, M_{age} = 21; *SD* = 3.97). An independent sample t-test revels that our manipulation of novelty was successful: for participants exposed to novelty visual banner campaign, the perception of novelty on the product was higher ($M_{Novelty}$= 4.42; *SD* = 1.42) than for participants exposed to an absent novelty visual banner campaign, (M_{Absent}= 3.95, *SD* = 1.73 $t(184) = -1.995$, $p = .047$),

Attitude toward the brand. ANOVA revealed a significant main effect of type of media (M_{AR} = 5.53, *SD* = 1.19; M_{Video} = 4.93, *SD* = 1.40; $F(1, 185) = 9.44$, $p = .002$), a non-significant main effect of novelty (M_{Absent} = 5.18, *SD* = 1.42; $M_{Novelty}$ = 5.26, *SD* = 1.24; $F(1, 185) = .081$, $p = .777$), and, more importantly, a marginally significant interaction effect between type of media and novelty ($F(1, 185) = 2.87$, $p = .092$), in a way that absent novelty conditional participants evaluated the AR media better than video (M_{AR} = 5.67, *SD* = 1.27; M_{Video} = 4.75, *SD* = 1.42; $p = .001$), while participants in the novelty condition evaluated both media equally (M_{AR} = 5.40, *SD* = 1.09; M_{Video} = 5.13, *SD*= 1.37; $p = .341$) (see Figure 2).

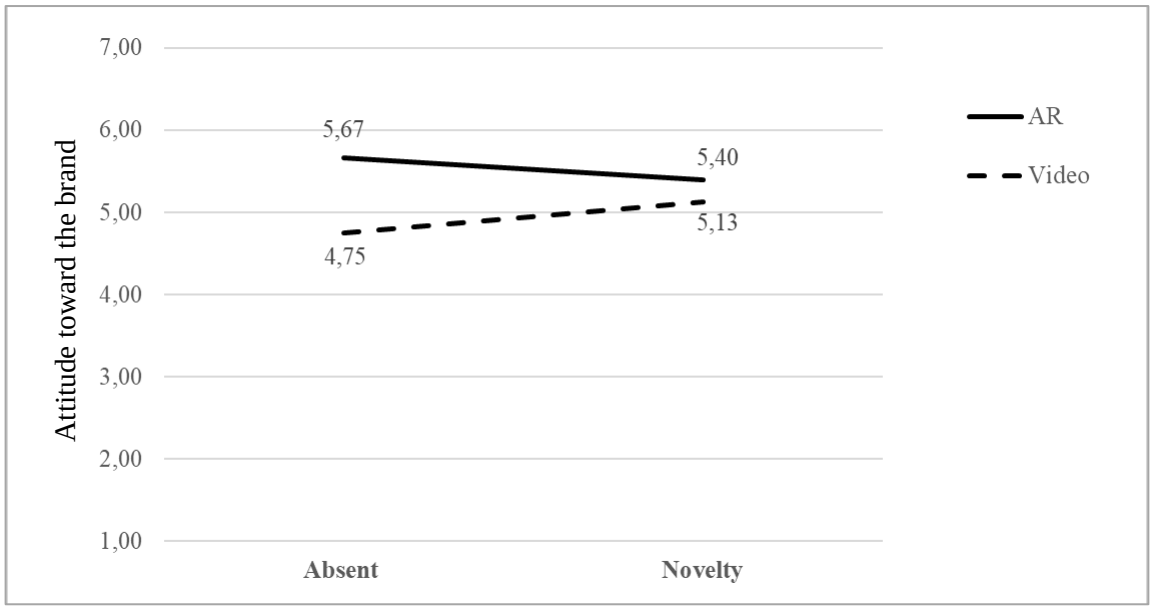
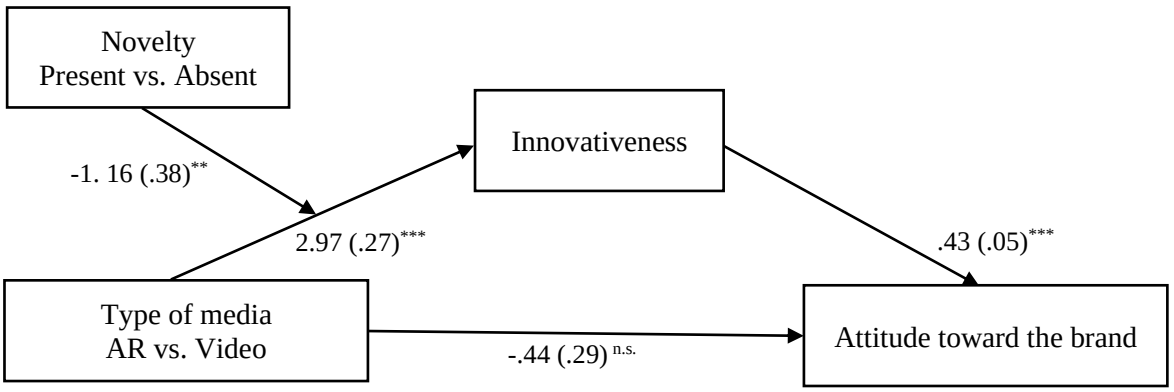


Fig. 2 The effect of type of media and novelty on attitude toward the brand

Willingness to pay. ANOVA results on willingness to pay indicated non-significant main effect either of type of media (M_{AR} = 2.97, SD = .95; M_{Video} = 2.87, SD = 1.02; $F(1, 185)$ = .307, p = .580) or novelty (M_{Absent} = 2.90, SD = .98; $M_{Novelty}$ = 2.94, SD = 1.00; $F(1, 185)$ = .024, p = .877). However, more interesting, the significant interaction ($F(1, 185)$ = 6.09, p = .015) indicated that participants in the absent novelty condition were willing to pay more for the orange juice on the AR condition (M_{AR}= 3.13 Brazilian real, SD = 1.00; M_{Video}= 2.69 Brazilian real, SD = .93; p = .030) while participants in the novelty condition were willing to pay equally on both conditions (M_{AR} = 2.80 Brazilian real, SD = .88; M_{Video} = 3.07 Brazilian real, SD = 1.09; p = .186).

Memory. ANOVA results on memory recall revealed a marginally significant main effect of type of media (M_{AR} = 3.00, SD = .72; M_{Video}= 3.18, SD = .64; $F(1, 185)$ = 3.13, p = .078), a non-significant main effect of novelty (M_{Absent} = 3.09, SD = .70; $M_{Novelty}$ = 3.10, SD = .67; $F(1, 185)$ = .032, p = .858), and a non-significant interaction effect ($F(1, 185)$ = 1.37, p = .243).

Mediation analysis. A bootstrapping procedure (Model 8; Hayes, 2013), specifying a confidence interval of 95% with 5,000 resamples, indicated that the type of media effect on attitude toward the brand is fully moderated mediated by how innovative individuals perceive the media campaign with a confidence interval excluding zero (indirect effect on absent novelty condition = 1.204, CI [.805, 1.684]; indirect effect on novelty condition = .813, CI [.471, 1.266]) (see Figure 3).



NOTES: *p <.05, **p <.01, ***p <.001, n.s.= not significant.

Fig. 3 Moderated Mediation analysis showing the effect of the interaction between type of media and novelty on attitude toward the brand via innovativeness in Study 2.

Discussion

As seen in the previous study, our results indicated that the use of the AR media has positive influences on attitude toward the brand. Again, as seen in the previous study, the AR media hurts memory recall.

However, the effect of the AR media on attitude toward the brand disappears when the product was already new. The same novelty moderation effect happens on willingness to pay. Presumably, individual perceptions that a stimulus is new or unfamiliar was stronger in AR compared to video condition. The perceived novelty, however, can be elicited not only by the technology used to promote the product. Actually, stimulus-relevant factors as the uniqueness in the way the stimulus is presented also can affect individuals' novelty perception (Grigorovici & Constantin, 2004). Our results confirm this assumption by showing how positioning the

target product as a brand-new option significantly reduced the difference in AR and Video condition.

GENERAL DISCUSSION

Given the growth in the use of smartphone phones, AR technology indicates particularly relevant benefits for the B2C market, as it allows the application of special communication strategies to assist consumer decision making. The Ikea, McDonald's, and Coke examples that we mentioned earlier show how this type of technology has been used to promote the relationship between consumers and brands. In addition to promoting entertainment and assisting in sales promotion, the effects of using AR are also observed in the consumer's shopping journey, which has been considerably influenced by the insertion of interactive technologies. AR can be useful for brands to get closer to their consumers, both in physical and online store environments, as in any other environment in which the consumer wants to interact through the use of the mobile device.

In the e-commerce segment, the possibility of trying a product before buying it is one of the factors that can help the decision to purchase and create experiential value for consumers, when developers focus on integrating the variety of message, the richness of image or visual pleasure, shaping the persuasive online interactive experience (Pantano et al., 2017). For physical retail, AR provides the possibility of obtaining quick information about consumer behavior, improving the point of sale through new tools, and positively influence consumers' shopping experience (Pantano & Naccarato, 2010).

In this research, we built upon the literature of commercial uses for AR technology to suggest that products' campaign using AR media increases consumers' perceptions of innovativeness and entertainment, which can accordingly improve brands' evaluations. We provided insights about the psychological mechanisms behind the positive effect of an AR media camping on the attitude toward the brand. Also, we demonstrated that consumers are willing to pay more for products when they are exposed to AR media camping.

Although our results suggest that the consumers' perception of an AR media as more innovative and entertaining than a video increases attitude toward the brand, the "wow" factor due to the innovative visualization and experience (Chandler, 2009; Parise, Guinan, & Kafka, 2016) shows a negative consequence of using an AR for campaigns with detailed information. It happens because of individuals' difficulty retrieving content information when exposed to an AR campaign. Consumers who were exposed to the video campaign remembered more information about it when compared to consumers exposed to the AR campaign, which can be explained by attention capacity theories: if alternative tasks capture consumers' attention (i.e., AR media), they will have less information capacity remaining to allocate to another task (i.e., memorize information) (Unsworth & Robison, 2016). Our results are supported by previous studies, which showed that curiosity prompts consumers to seek information and, in turn, increases the time spent and attention devoted to specific information (Menon & Soman, 2002).

The current work makes another theoretical contribution in establishing when an AR media campaign may not have the expected effects on the attitude toward the brand. Study 2 results showed that employing the AR media campaign on a new product brings results for a brand as positive as using the video campaign and renewing that product. Thus, an AR media campaign can give an innovative look to a product that is not new; however, it does not affect a product that is already new.

Studies on the application of AR in retail indicate that the use of this technology can influence conversion rates, reduce return rates and provide a means of personalized pre-purchase evaluations (Dacko, 2017), in addition to promoting positive attitudes towards the environment and increased purchase intent (Yim, Chu, & Sauer, 2017). Our results are

consistent with these assumptions by showing AR effects on attitude, willingness to pay, and perception of innovativeness and entertaining. However, unlike previous literature that focuses almost exclusively on the AR positive effects, our study shows a negative consequence of using an AR technology for campaigns with detailed information. Besides, we demonstrate why and when AR media campaigns are positive for products' communication, which may support managers to decide when uses the technology for their marketing strategies.

As a final consideration, given the infinity of potential theoretical and practical expansions on marketing AR applications, we hope the current work invites future explorations of how and when the entertaining AR media characteristics may influence consumers' perception of hedonism and pleasure on utilitarian products. Also, the negative effect on individuals' memory also reveals a relevant research task. Individuals' subjective confidence in their memories seems to influence their subsequent decision-making (Hembacher & Ghetti, 2014; Krebs & Roebers, 2012) even when they recollect information from non-accurate memories (Hembacher & Ghetti, 2017; Otgaar, Scoboria, & Mazzoni, 2014). More information can increase confidence in judgments (Gill, Swann, William, & Silvera, 1998), however, previous studies found that this confidence was observed even when the accuracy of judgments was not necessarily affected (Stewart, Heideman, Moninger, & Reagan-Cirincione, 1992). Thus, future studies could investigate how confident individual is on the information they recalled and to assess how it affects individuals' general evaluations.

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APPENDIX A

Study 1: Augmented reality and video conditions



APPENDIX B

Study 2: Novelty and augmented reality manipulation conditions



Study 2: Novelty absent and video manipulation conditions

