Consumers' online shopping experience with augmented reality: A way to influence consumers' knowledge and behavior

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Abstract

Augmented reality (AR) is an innovative technology that may provide a solution for consumers' feelings of uncertainty. Brands have already discovered the benefits of AR in online shopping, since an increasing number of brands are using it as a marketing tool to grow their market size. Whereas the focus of AR has mainly been on marketing opportunities and the development of the technology, this research aimed to investigate what beneficial effects it can have on consumers' online shopping experience. It was expected that uncertainty would be particularly high for products that would be perceived as high in financial and performance risk as opposed to low financial and performance risk perceptions The main study, is a 2 (use of AR technology, i.e., online shopping with AR vs online shopping without AR) by 2 (product functionality, i.e., high functional product vs low functional product) by 2 (product financial risk, i.e., high financial risk vs low financial risk) between-subjects design (*N* = 243). A survey was distributed in which participants were randomly assigned to one of the eight conditions to look at a mock-up of a webshop that sells a coffee machine. The participants of the with AR conditions also had to watch an AR video demonstration of the coffee machine. After, the visual materials participants answered statements that measured purchase uncertainty, purchase intention, satisfaction, evaluation and interactivity. The findings showed AR's effectiveness as participants' purchase uncertainty decreased when they perceived performance risk and financial risk perceptions. AR has positive influence on satisfaction, evaluation and interactivity while consumers have financial and performance risk perceptions. Finally, AR appeared to be important when financial risks were perceived as high because it induced greater levels of satisfaction. These, results testifies to the potential of AR to create an enjoyable and interactive online shopping experience and to be.

Keywords: augmented reality, product risk, online shopping, purchase uncertainty

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Introduction

These days, new technologies are rapidly developed to enhance online customers' experience and more companies try to keep up with these new developments. In particular, the implementation of augmented reality (AR) has received a lot of attention from well-known brands. AR can be defined as a real-time interactive technology that combines the physical world with a virtual layer to provide more information (Azuma, 1997; Javornik, 2016). Brands are more willing to use this technology as it is a new tool to use for their marketing strategies (Javornik, 2016). Cosmetic organizations (e.g., Sephora) were one of the first to present AR technology in the form of a virtual mirror (Jeakel, 2016). With the virtual mirror of Sephora shoppers have to look at the mirror which detects the look and outfit of the shopper then it recommends the shopper a make-up look which the client sees on themselves by looking at virtual mirror (Jeakel, 2016). Other well-known brands such as IKEA, Ray ban, Nike, and Adidas also saw the potential of AR in order to let the consumer experience a more realistic representation of the product (Archer, 2015; Javornik, 2016). Furthermore, it is expected that the overall market size for the implementation of AR increases from 640.2 million in 2015 to a predictable revenue of $120 billion in 2020 (Merel, 2015). AR technology is available on various devices, such as smartphones. Moreover, the number of smartphone users has increased from 2.5 billion to an estimate of 3.2 billion in 2019 (Dacko, 2016; Holst, 2019). This demonstrates that more and more people can and will have access to AR applications

Online shopping, in general, is a highly uncertain activity for most consumers as opposed to shopping in a physical store, where consumers can apply all of their sensory modalities to evaluate the product. For that reason, this study examined if AR technology can reduce purchase uncertainty when shopping online. Additionally, the influence of AR technology on

consumers' satisfaction, purchase intention and interactivity was also investigated. For this study, it was important to consider the type of product because purchase uncertainty varies across products. For example, uncertainty is lower when buying toothpaste online than when buying a washing machine. Therefore, this study explored if the relation of AR and uncertainty is moderated by product type (i.e., financial and functional risk).

Based on existing information the following research question was formulated: To what extent does augmented reality impact purchase uncertainty as well purchase intention, satisfaction, evaluation and interactivity during online shopping?

Theoretical framework

When consumers shop online they will most likely encounter feelings of uncertainty because of the various consequences their decision could have (Zhang & Liu, 2011). Multiple facets clarify why purchase uncertainty is particularly more conspicuous in an online shopping context than in a physical store context. First, in the online context consumers are not able to try or touch the wanted product which consumers need to do to increase their level of product knowledge or experience with the product (Zhang & Liu, 2011). Additionally, customers cannot immediately judge whether the state of the product is faulty or good, therefore online purchase uncertainty increase because of the chance to buy a damaged product (Naiyi, 2004). Not to mention that other sensory stimuli such as smell, which people also use when buying a product (e.g., perfume or flowers) are not possible (Zhang & Liu, 2011). Second, consumers have limited access to information because they are not able to directly communicate with an employee to ask for product-related information or even suggestions about possible alternatives (Dai, 2007). Third, online shopping is a technological experience which requires some steps such as sharing personal information that some consumers prefer not to award because people risk to be a victim of identity theft (Naiyi, 2004).

Augmented reality may be a beneficial technology that can assist consumers to reduce the feeling of online purchase uncertainty as it enables them to make better evaluations. This might be possible since the formerly mentioned technology is able to provide more visual and detailed information about the product (Javornik, 2016). Furthermore, AR technology is able to let the consumer try on their preferred product via a virtual layer (Olsson, Kärkkäinen, Lagerstama & Ventä-Olkkonen, 2012). For example, a consumer tries to fit shoes by focusing the camera of their mobile device towards their feet and the screen of the mobile device illustrates the shoes on the consumer's feet. To elaborate, according to Littler and Melanthiou

(2006) online purchase uncertainty is distinct from risk but still related to the perceived level of risk consumers attribute to the product type within a category.

Product type

Online shopping is already related to people experiencing some negative feelings which might be influenced by the type of product a person wants. In this study, a distinction of product type has been based on the perceived level of risk the product creates within the consumer. The perceived risk of a product consists of handheld risk and inherent risk (Lee & Huddleston, 2006). The former factor of perceived product risk is more relevant since it focuses on the levels of risk associated with a product within a certain category. Different studies demonstrated that several kinds of risks are interrelated and, therefore, create the overall level of the perceived risk of a product (Lee & Huddleston, 2006). A total of six components form the overall perceived risk of a product such as product performance risk, social risk, financial risk, psychological risk, physical risk, and time risk (Roselius, 1971; Jacoby & Kaplan, 1972). However, in this research the focus on perceived financial and product performance risk while shopping online because Bhatnager and Ghose (2004) found out there is a strong association between them.

First, some researchers investigated that consumers' level of perceived financial risk has a significant role when shopping for a product (Littler & Melanthiou, 2006; Zhang & Liu, 2011). Furthermore, the perceived financial risks level that consumers feel are higher in the online environment. First, as the price of a product increases so will the perceived financial risk, in the online setting this even more deeply experienced because there is only a picture of the product (Bhatnagar, Misra & Rao, 2000). Additionally, consumers will experience higher financial risk towards technological (e.g., laptop) or search products (e.g., camera, tv or

speakers) because these products are generally very expensive (Lee & Huddleston, 2006; Zhang & Liu, 2011).

Performance risk is another risk associated with online shopping, it refers to the risk of the product not functioning as it should (Low, 2010). The aforementioned can be related to the technical complexity of a product as well, because the substantial amount of technical features prompts the feeling that the product might not function (Bhatnagar, Misra & Rao, 2000; Lowe, 2010). AR would support consumers because it enhances consumer engagement which enables consumers to better evaluate the product performance (Javornik, 2016).

Consumers might perceive progressive levels of product failure because online shopping makes it more difficult to evaluate product quality (Masoud, 2013). Furthermore, consumers are not able to immediately test the product in order to evaluate the performance of the product (Kim & Lennon, 2009). Moreover, performance risk is commonly associated with the different types of products in different product categories such as clothing, electronics (e.g., laptop or computer accessories) or home entertainment (Ahuja & Raman, 2003; Ward, 2001).

These forms of product risks will lead to an increase in purchase uncertainty because as stated earlier in this paper product risks and uncertainty are interrelated. However, not only information about the product but also of other people can increase consumers' knowledge, since a lack of it increases uncertainty (Miliken, 1987; Zhang & Liu, 2011). An increase of knowledge would reduce the perceived level of financial and performance risk towards the product. AR would be beneficial as it is able to provide information via different media forms which decrease consumers' cognitive load and, therefore, learn more efficiently and gain more certainty (Javornik, 2016; Mayer, 2014).

Augmented reality

Augmented reality (AR) is a technology that is not only interactive but also combines the physical world and virtual fundamentals by putting a layer between the virtual elements and the real world (Javornik, 2016). The virtual layer adds different forms of information on the physical environment such as images, videos or written information (Javornik, 2016). Additionally, Azuma (1997) states that the three main features of AR consist of the ability to integrate the virtual elements in the physical world, it is applied in real-time, and AR renders in three dimensions. Furthermore, AR can be applied to smartphones, tablets, glasses, screens or online websites, for example (Carmigniani et al., 2010; Javornik, 2016).

Augmented reality is a technology that offers various functions that provide online shoppers a rich experience that could lead to beneficial outcomes such as satisfaction (Carminiani et al., 2010; Poushneh & Vasquez-Parraga, 2017). First, as stated earlier AR can add a virtual layer of different media forms (e.g., videos, pictures or text) on the real-life environment that serves as cognitive support (Bower, Howe, McCredie, Robinson & Grover). Additionally, the cognitive support that stems from the use of AR technology may result that a person memorization enhances (Fujimoto, Yamamoto, Kato & Miyazaki, 2012; Fujimoto, Yamamoto, Taketomi, Miyazaki & Kato, 2013). For instance, if people buy a product of a specific brand that uses AR, people tend to memorize that brand better. According to Mayer (2014), AR has the capability to decrease the cognitive load because AR is able to visualize the information via different digital channels depicted in the real world making it easier to process the given information (Mirbabaie & Fromm, 2019). This allowes individuals to make it easier to retrieve information from their memory.

Furthermore, studies have demonstrated that AR can increase consumers' purchase intention. This is due to the fact that AR technology is to some extent able to let consumers interact with the product through rotation or virtual try-on (Javornik, 2016). Consumers who shop online

are, for instance, able to use an application via their smartphone or their laptop in order to use AR. For example, customers of Converse can use an application (e.g., tablet or smartphone) to see whether the shoe looks good or not (Paine, 2018). Another example is RayBan, the brand allows their customers to try-on its preferred glasses via the camera of their device (e.g., laptop) (Paine, 2018). Yim, Chu, and Sauer (2017) explained that AR can increase purchase intention because of people's perception of the usefulness and interactivity of the technology, which generates positive feelings towards AR.

Another impact of AR technology on consumers is that it can increase the level of satisfaction of them. Consumers might perceive AR technology as a hedonic technology, which makes the experience of shopping online more pleasurable or enjoyable (Poushneh & Vasquez-Parraga, 2017). Customers are satisfied when they consider the experience as pleasurable but also that the experience lives up to their expectations (Poushneh & Vasquez-Parraga, 2017). AR can make buying a product enjoyable and better because consumers have more access to information, vivid images and interaction with a product (e.g., rotating and zooming-in) (Javornik, 2016; Poushneh & Vasquez-Parraga, 2017). The fact that consumers can use a device such as a smartphone, which enables them to use AR technology, increases the level of an engagement during the shopping experience (Cano, Perry, Ashman & Waite, 2017).

AR and price risk

Prior studies already demonstrate that consumers have certain risk perceptions when shopping online that influence their purchase intention (Grewal, Krishan, Baker & Borin, 1998; Sweeney, Soutar, & Johnson, 1999). According to a study by Roselius (1971) and a study by Taylor (1974) consumers' intent to purchase a product is low when the perceived risk level is high. High financial risk perceptions would mean that the monetary loss, such as product price, taxes, and possible delivery costs, would be too high (Kukar-Kinney & Close, 2010). Consequently, consumers that perceive higher levels of financial risk when shopping online

for a product, will most likely not have the intent to buy that product. Similarly, high performance risk will also induce less intention to purchase a product. Consumers would experience more purchase uncertainty when the perceived level of financial risk is high. To explain, online consumers can only see a static image of a product with a brief product description, which might not be enough information to be certain about the purchase of the wanted product (Egeln & Joseph, 2012). Thus, besides consumers' lack of knowledge and other sensory stimuli that generate uncertainty, there is also the fear and risk of losing a lot of monetary value which contributes to an increase of uncertainty (Howcroft, Hamilton & Hewer, 2007).

AR technology would be more valuable for consumers with high perceptions of financial risk. AR technology is beneficial because it can increase certainty due to its ability to show product demonstrations and provide detailed product information (Dacko, 2017). AR can display the product more vividly and aid product interaction, which stimulates consumers' information processes (Yim, Chu & Sauer, 2017). Consumers' intention to purchase the product would increase as AR reduced the gap between the high financial risk perceptions and lack of knowledge.

In general, consumers try to be risk averse which means that consumers are focused on reducing uncertainty, especially when financial risk is high. The perceptions of high financial risk could be mitigated as their knowledge increases. According to Howcroft, Hamilton, and Hewer (2007) consumers want to gain information about the products and stressed the importance of consumers' urge to feel more engaged with products, during their information search. AR technology apps enable consumers to be more immersed with the product while increasing their product knowledge (Scholz & Smith, 2016). Consumers can see the augmented product in their environment through their device which assists consumers to interact with the product by zooming- in, rotating the product or even virtually trying-on their

product (Reitmayr & Schmalstieg, 2004; Olsson, Kärkkäinen, Lagerstama & Ventä-Olkkonen, 2012). Moreover, consumers can make better evaluations of whether it is worth to take the peril of purchasing a high financial or performance risk product as AR offers more information and better images of the product (Javornik, 2016).

The results of Johnson, Sivadas, and Garbarino (2008) demonstrate that customers' perceptions of risk may also jeopardize satisfaction. In particular, customers' satisfaction will be low when perceived financial risk is high because customers would judge their product experience more negatively (Oliver, 1997). However, customer satisfaction may become better as certain measures can reduce perceptions related to financial risk (Johnson, Sivadas & Garbarino, 2008). AR would be a measure that would be able to reduce customers' risk perceptions because it provides richer information that is displayed in customers' real-time environment, and therefore, increase satisfaction (Dacko, 2017).

AR and performance risk

Consumers' perceived product performance risk is an important factor to take into account when shopping online as it could result in negative effects. A product that is high in perceived performance risk would negatively affect consumers' purchase intention (Roselius, 1971; Taylor, 1974). High perceived performance risk products refer to consumers' perceptions of the product not being able to perform according to their expectations (Low, 2010). Moreover, the more functionalities the product has the more complex it will be, which increases consumers' perceptions of performance risk (Bhatnagar, Misra & Rao, 2000; Lowe, 2010). Subsequently, the purchase intention of consumers will decline as their performance risk perceptions increase because consumers would not buy products of which they fear it would not perform as it should.

Next, consumers become more uncertain about their purchase when they have high performance risk perceptions. Online consumers are dependent on product descriptions, images, and perhaps reviews, which might not be adequate to be entirely informed about the product performance and its complexity (Jarvenpaa & Tractinsky, 1999; Korgaonkar & Karson, 2007). Additionally, consumers are missing the tangible experience with a product, and have difficulties to fully understand the capabilities of the product because they do not have sufficient information (Masoud, 2013). Hence, a shortage of information and physical contact with the product increases purchase uncertainty. AR provide consumers with complete information and better product images that could decrease the risk perceptions of the products performance and increase consumers' purchase intention.

AR provide consumers with complete information and better product images that could decrease the risk perceptions of the products performance and increase consumers' purchase intention. Furthermore, AR is an technology which enables consumers to try if the product fits in their home environment or on their own body before buying (Smink, Frowijn, Reijmersdal, Noort, & Neijens, 2019). This would lead to an interactive experience for consumers who would obtain in-depth information to make better evaluations about whether the product will perform accordingly, and therefore, reduce performance risk perceptions.

Besides, customers would be hypercritical towards their customer satisfaction assessments when they perceive high levels of performance risk (Oliver, 1997). Products of which consumers have high performance risk perceptions will mostly likely not fulfil customers' needs or expectations as they would not function as anticipated. According to Mengi (2009) customers satisfaction could be increased as customers become more assured about the product. Moreover, if customers gain more information about the product they would have more confidence in the performance of the product. AR would be a tool that could provide customers with more detailed information about the product (Dacko, 2017). Therefore, they

would become more assured about how the product would perform, which would result in higher levels of customers satisfaction (Kumar, Mani, Mahalingam & Vanjikoven, 2010; Mengi 2009).

H1: Online shopping with (as opposed to without) AR technology reduces the feeling of online purchase uncertainty.

H2: The level of purchase intention is higher of online shoppers that use AR technology compared to the online shoppers without AR technology.

H3a: Customers' satisfaction is higher for online shoppers with AR technology (as opposed to without AR).

H3b: Shopping online with AR technology (as opposed to without) increases consumers' ability to make explicit product evaluations.

H3c: AR technology increases consumers' online shopping interactivity as opposed to shopping online without AR technology.

H4a: Shopping online with AR has a greater effect on purchase uncertainty when the financial risk perception is high as opposed to when the financial risk perception is low.

H4b: Shopping online with AR has a greater effect on purchase intentions when the financial risk perception is high as opposed to when the financial risk perception is low.

H5a: Shopping online with AR will have a greater effect on purchase uncertainty when the performance risk perception is high as opposed to when the performance risk perception is low.

H5b: Shopping online with AR will have a greater effect on purchase intentions when the performance risk perception is high as opposed to when the performance risk perception is low.

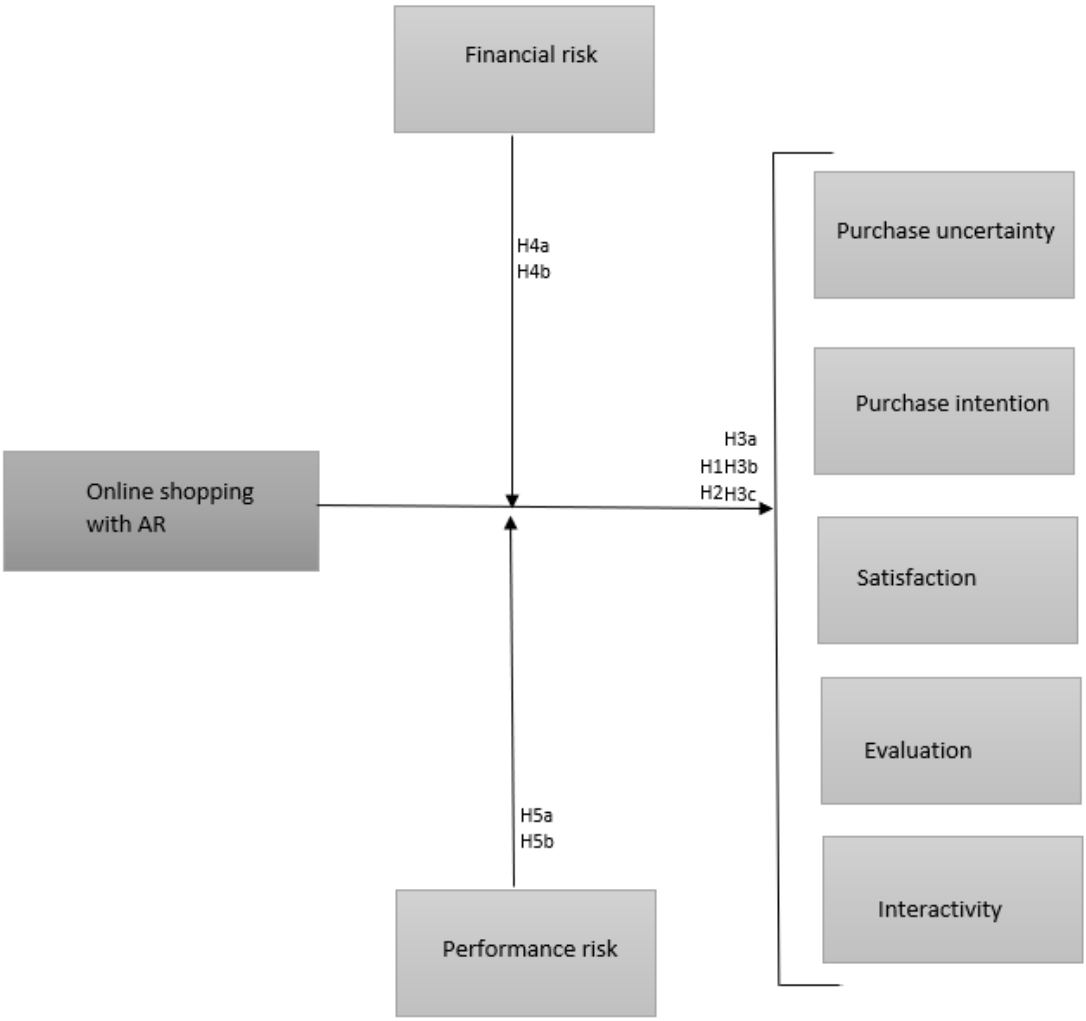

Figure 1: Research model

Method

Research design

For this research paper an online survey was distributed, to measure main and interaction effects in a 2 (Use of AR technology: online shopping with AR vs online shopping without AR) by 2 (Product functionality: high functional product vs low functional product) by 2 (Product financial risk: high financial risk vs low financial risk) research design.

Pretest

A pretest was required to test which products people perceive as high performance risk products and which ones are low in risk. A total of eleven persons were asked to take part in the pretest. The participants were all adults, ranging from 23 to 56, who were all familiar with online shopping.

Additionally, participants were asked to give feedback on whether they distinguish a product as high in financial/performance risk or low. A total of five products were selected from different product categories such as furniture, appliances, and accessories. To explain, according to a study by Lee and Huddleston (2006), and a study of Zhang and Liu (2011) technological products are perceived as high in financial risk. For that reason, a coffee machine and microwave were selected because they are products that have several technological aspects (e.g., digital displays or multiple automatic functions). Due to the technological aspects of the two aforementioned products, consumers may assume that the products are also high in performance risk (Bhatnagar, Misra & Rao, 2000; Lowe, 2010). The other three products (i.e., shoes, watch, and a bathroom cabinet) were chosen because they did not include high technological aspects and complex elements. Thus, these products were used

to check and confirm that people perceive high financial/performance risk towards technological products.

Next, participants were asked to look at a total of ten created images of the five products of which one image showed the expensive version of the product and the other the inexpensive version (see appendix 1). For instance, the actual price for the expensive microwave was €425,00 and the inexpensive version cost €90,00.

However, the set prices for each product pair (i.e., expensive vs inexpensive) were the same to guarantee that the participants also paid close attention to the product image and description (See Appendix 1). By observing the product carefully and reading the description of it, respondents were able to answer statements regarding product performance risk. For example, ”The product has too many functionalities that can cause product failure” or “I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance”. Additionally, respondents were asked to answer five statements on a seven-point Likert-scale about the perceived financial risk of the product such as “The product is overpriced”, “The financial risk of purchasing this product online would be too high”.

Then they were asked to indicate their minimum and maximum price for the product based on the image and product description. Based on the input from the participants, regarding low financial risk and high, the minimum price of the coffee machine was around € 100,00 and the maximum €1000,00

The results indicated that for all products whether the actual price was high or low, the respondents perceived high levels of financial risk. Furthermore, as stated above, the pretest did not only include products that in general are perceived as high in financial risk. The products that were expected to be high at risk were the microwave and the coffee machine.

However, of all of the tested products, the mean score of financial risk was the lowest for the microwave. An important criterion for the main study product was that it had to have a high mean score for financial risk. The mean score of the microwave did not meet this standard, and therefore, it was not taken further to the main study. The coffee machine met both of the most central set criteria's, which were a high mean score for financial risk, and a high mean score for performance risk.

Furthermore, the pretest verified which AR application would apply the most realistic form of AR technology. A total of four apps were selected because they were able to augment the five chosen products. There were not many AR apps available, and most of them were not able to augment the five selected products. Consequently, some of these apps were able to solely apply AR to one specific product such as the "Wanna kicks" app or the "AR Watch" app. Therefore, it was possible that the mean score of a certain app was high but it would not be able to augment the product.

Respondents first had to look at an image of an AR app such as the "Ikea place app", then they were asked to answer four statements. Some examples of statements that were used are: "With the use of this AR app I would be able to make better product evaluations", "This augmented reality app would be valuable when shopping online". Out of the four apps, respondents selected the "Houzz" and "AR watch" app as the best apps that would be able to apply AR technology. Whereas the mean scores of the two aforesaid apps were almost similar, the mean scores of the "Wanna kicks" and "Ikea place" app were lower than those two. However, as stated above the "AR watch" application was only able to augment a watch, and therefore, not selected for the main study.

Although the "AR Watch" had the best mean score, the coffee machine was taken to the main study because this appliance met the two most important criteria. Moreover, the "Houzz" app which slightly scored lower than "AR Watch" was able to augment the coffee machine. Thus,

the decision to use the “Houzz app” as the second best was made. Unfortunately, the AR function of the “Houzz” application did not perform on any of the available devices such as “Android” smartphones/tablets or laptops with “Microsoft” software. In table 1, an overview of the overall mean scores of the AR applications is demonstrated.

Table 1:

AR app overall mean scores

App	*M*
Houzapp	5.43
IkeaPlace App	5.23
Wanna Kicks	5.25
AR Watch	5.5

Since it was crucial to have an application to augment a coffee machine the AR function of the “whole latte love” website was selected to create an AR demonstration video of the coffee machine for the main study. This AR demonstration video was made because due to circumstances it was not possible to conduct an experiment for the main study, in which participants would have been able to use the AR function of the website.

Participants

The participants that were sought for this study had to be eighteen years of age or older in order to participate. They were collected via the social network of the researcher and had to have some knowledge of the Dutch or English langue in order to participate in the survey. Furthermore, there was no maximum set for the age. In addition, participants were asked to state how often they shop online to use as an indication of their knowledge and experience with shopping online.

A total of 316 people filled in the survey, which surpassed the required minimum of 240 participants. However, some of the participants did not complete the survey, and were therefore deleted from further analysis. A total of 243 respondents (69 male and 174 female respondents; mean age: 28.6 years; age range: 18-100 years) participated in the survey. Furthermore, 51% of the sample indicated that they are very to extremely frequent online shoppers.

Table 3 not only demonstrate the age of the participants distributed over the eight conditions but also their gender. Furthermore, an ANOVA test was conducted to investigate that age, gender, and education were equally distributed among the eight conditions. The test confirmed that there was no significant difference as the p-values of the ANOVA test were above the significance level of 0.5 and therefore, age, gender, and education are equally distributed ($\text{p-value}_{\text{Education}}$= 0.781, $\text{p-value}_{\text{age}}$=0.420, and $\text{p-value}_{\text{gender}}$=0.528).

Table 1.

Demographics of participants per condition

Condition	N	Age		Gender	
		M	**SD**	**Male**	**Female**
Without AR, high financial risk, high performance risk	24	31.6	10.0	29%	71%
Without AR, high financial risk, low performance risk	34	29.5	11.3	29%/	71%
Without AR, low financial risk, high performance risk	27	28.4	8.4	37%	63%
Without AR, low financial risk, low performance risk	31	25.6	6.4	35%	65%
With AR, high financial risk, high performance risk	32	28.7	9.9	16%	84%
With AR, high financial risk, low performance risk	29	26.7	8.4	31%	69%
With AR, low financial risk, high performance risk	38	29.5	11.5	32%	68%
With AR, low financial risk, low performance risk	28	29.0	9.3	18%	82%

Procedure

The participants of this study filled in a survey via an online program named “Qualtrics”. The survey was distributed to the participants via WhatsApp and shared on online platforms (e.g., Facebook). Additionally, participants were asked to share the link with other prospective participants (i.e., Snowball sampling) (Goodman, 1961).

The questionnaire was divided into different sections but with a specific order. First, a brief introduction that informed the respondents about the name and contact information of the researcher, and the objective of the research was specified. After, the introduction respondents had to give their consent, and if they did, they were free to end the survey at any moment. The first questions that the participants had to answer were demographic questions such as age, gender, education, and how often they shop online. These questions were used as additional information because they may affect how respondents answered the remaining questions of the survey.

Next, each participant was randomly assigned to one of the eight conditions after the demographic questions. In each condition, respondents were asked to read a scenario that described that they had to imagine to shop online for a new coffee machine, and were asked to look at an image similar to an online webshop. However, four out of the eight conditions were part of the shopping “with AR condition”. For that reason, some participants did not only have to look at the image of an online webshop but also had to look at the created AR video demonstration of the coffee machine. Figure 2 depicts screenshots of the used AR video demonstration. The application “YouCut” was used to edit the video of the AR demonstration. The video demonstration that some of the participants saw, demonstrated the various functions of the “Whole latte love” AR technology. For example, being able to display the coffee machine in people’s own environment, zooming in, rotating the product, and walking around the product to see all angles of the coffee machine.

In the final section of the survey, participants read and answered several statements on a 7 point Likert-scale based on what they saw in their condition. Lastly, the participants were thanked to take part in the research.

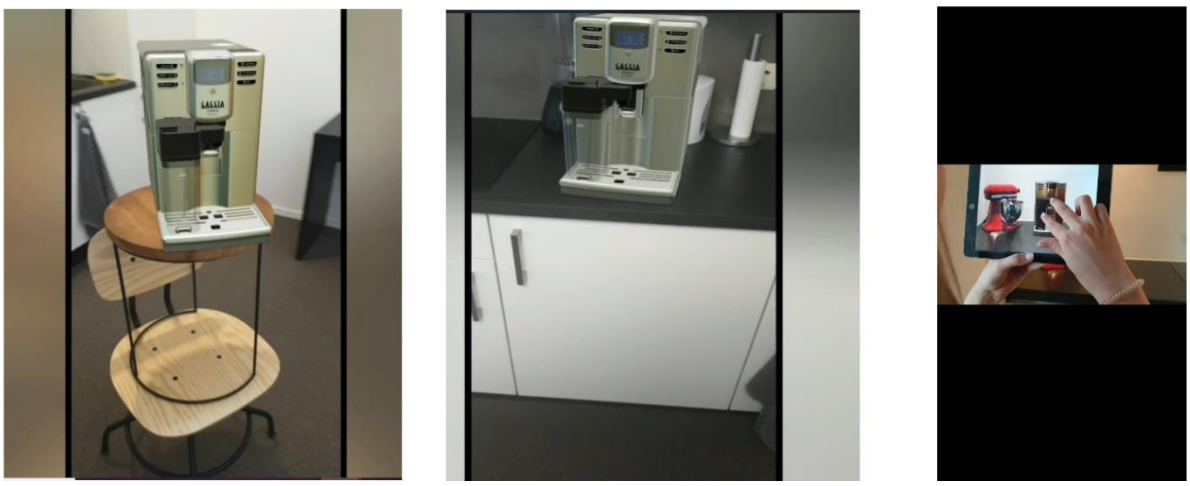

Figure 2: Screenshots of AR video demonstration

Measures

The participants of this study had to indicate to what extent they would agree or disagree with the formulated statements, which were all based on a 7-point Likert scale that ranged from *strongly disagree* (1) to *strongly agree* (7).

Dependent variable: Purchase uncertainty. A four-item measurement assed the intentions customers had to buy the coffee machine. Prior work of Luo, Ba and Zhang (2012) were used as a foundation to formulate the following items: "Based on what I have seen, I would be able to make a thoughtful decision to purchase this coffee machine", "Based on what I have seen, I became knowledgeable about this coffee machine", "Based on what I have seen, I would be hesitant to purchase this coffee machine", and "Based on what I have seen, I did gain enough information to be certain about purchasing this coffee machine". However, the scale that measured purchase uncertainty was initially not reliable ($\alpha = 0.57$).

Therefore, the item *"*Based on what I have seen, I would be hesitant to purchase this coffee machine" was deleted to increase scale reliability (α = 0.68), which is acceptable.

Dependent variable: Purchase intention. As stated earlier in this study, AR can increase consumers' purchase intention. This variable was measured on a four-item scale regarding consumers' willingness to buy the product (α = 0.85). The items were "I would consider purchasing this coffee machine*"*, *"*It would be nice to have this coffee machine at home ", "This coffee machine appeals to me", "I like the design of this coffee machine", and "This coffee machine would likely be the one for me to own". The items were formulated based previous work (e.g., Ajzen & Madden, 1986, Han & Kim, 2010).

Dependent variable: Satisfaction. Satisfaction measured the likelihood that customers enjoy shopping with AR or perceive shopping with AR as meeting their online shopping expectations. The formulated items were based on the work of Lee and Gin (2005), and on the validated SERVQUAL satisfaction scale (Izoga & Ogba,2015). The items were altered in order to measure satisfaction when shopping online. The modified adopted items were "Based on what I have seen, I would be satisfied about the way the coffee machine is presented to me online", and "Based on what I have seen, I would say that the way the coffee machine is shown on the website is excellent" (α = 0.82).

Dependent variable: Evaluation. In order to measure the evaluation variable a four item measurement scale was used. The items of the scale were formulated based on previous literature (e.g., Olsson, Kärkkäinen, Lagerstama, & Ventä-Olkkonen, 2012, Javornik, 2016, Scholz, & Smith, 2016). This resulted in the following items: "Based on what I have seen, I would be able to make good evaluations of this coffee machine", "Based on

what I have seen, I would be able to thoroughly evaluate this coffee machine", "Based on what I have seen, I would be able to elaborately asses this coffee machine", and "Based on what I have seen, I would say I have a good understanding of this coffee machine's benefits" (α = 0.89).

Dependent variable: Interactivity. The items were formulated on previous literature (e.g., Vivek, & Beatty, 2012, Kumar et al., 2010). The constructed items were "Based on what I have seen, I think that I would to feel involved during the purchase of this coffee machine", "Based on what I have seen, I think that I would like to try out all the features this website offers to interact with the product", and "Based on what I have seen, I think that I would feel engaged during the purchase process" (α= 0,83).

Moderator variable: Performance risk. Seven statements were formulated to measure the performance risk perceptions. The items of this variable were formulated based on the previous work of Forsythe and Shi (2003), Almousa (2011), and Masoud (2014). An example of a statement that was used to measure performance risk was, "Based on what I have seen, the coffee machine, would, in all likelihood, need a lot of maintenance overtime" (α = 0.83).

Moderator variable: Financial risk. It is also presumed that financial risk will influence the relation between the dependent and independent variables. A five-item measurement scale was used measure people's financial risk perception. The formulated items were, "Based on what I have seen, I would not purchase this coffee machine because the product is too expensive", "Based on what I have seen, I would not like to risk to lose money on this coffee machine", "Based on what I have seen, I would perceive the financial risk of this coffee machine as too high", "Based on what I have seen, I would be concerned about the high financial risk of the coffee machine", and "Based on what I have seen, I would say that this coffee machine is affordable". Previous work on perceived risk while shopping online formed the base for the formulated items (e.g., Bhatnagar, Misra & Roa, 2000, Forsythe & Shi, 2003, Almousa, 2011, Masoud, 2014). The constructed items of the financial risk scale were reliable (α= 0.83).

Results

An analysis of variance was conducted to examine the effect of online shopping (with AR or without AR), financial risk (high or low), and performance risk (high or low) as the independent variables on purchase uncertainty, purchase intention, satisfaction, evaluation, and interactivity as the dependent variables. After, conducting the analysis follow-up analysis were done for the interaction effects that were statistically significant by means of pairwise comparison (with Bonferroni correction).

Purchase uncertainty

The expected main effect of the independent variable online shopping (i.e., with AR or without AR/web) on purchase uncertainty as dependent variable was statistically not significant (F (1,235) = 0.242, p = 0.623, η^2 = .00). This outcome confirms that hypothesis 1 was not supported, online shopping with AR does not reduce the feeling of purchase uncertainty as opposed to shopping without AR. The ANOVA test revealed that there was a main effect of performance risk as independent variable on the dependent variable of purchase uncertainty (F(1,235) = 6.22, p = .013, η^2 = .03), which was not hypothesized. Moreover, the main effect showed that the participants who were exposed to low performance risk scored significantly higher on purchase uncertainty (M= 3.89, SD = 1.10) than with high performance risk (M = 3.53, SD = 1.08).

Furthermore, the main effect of financial risk on purchase uncertainty was not significant (F(1, 235) = .40, p = .528) neither were the two expected interactions effects (performance risk X online shopping: F(1, 235) = 2.13, p = .146, & financial risk X online shopping: F(1, 235) = .79, p = .376). Based on the results hypothesis 4a was not supported, shopping with AR does not have a greater effect on purchase uncertainty when financial risk perceptions are high as opposed to low. Similarly, shopping online with AR does not have a greater effect on

purchase uncertainty when performance risk is high as opposed low, which indicates that the results did not support hypothesis 5a. The interaction effect (financial risk X performance risk: $F(1.235) = 2.90$, $p = .090$, $\eta^2 = .01$) was marginally significant.

Additionally, the three-way interaction of (online shopping X financial risk X performance risk: $F(1.235) = 4.34$, $p = .038$, $\eta^2 = .02$) was significant. As shown in Fig. 3a., the use of AR had a negative effect on the relation when participants perceived high performance risk perceptions. Whereas in Fig., 3b., AR had an positive influence when participants perceived low performance risk. It also appeared that when participants perceived low financial risk perceptions AR had no effect. However, with high risk perceptions AR's effect depended on the performance risk perceptions of the participants.

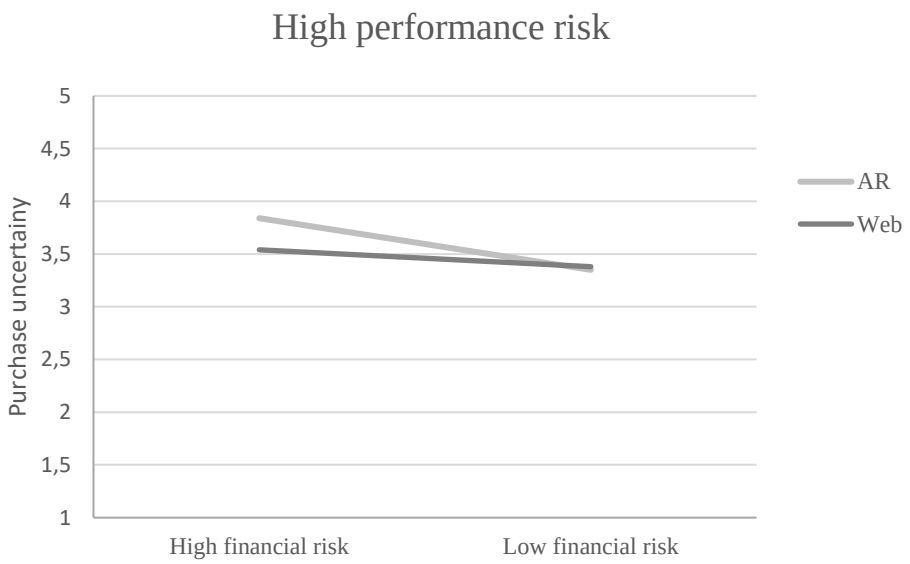

Figure 3a: Mean purchase uncertainty as function online shopping, performance risk and financial risk

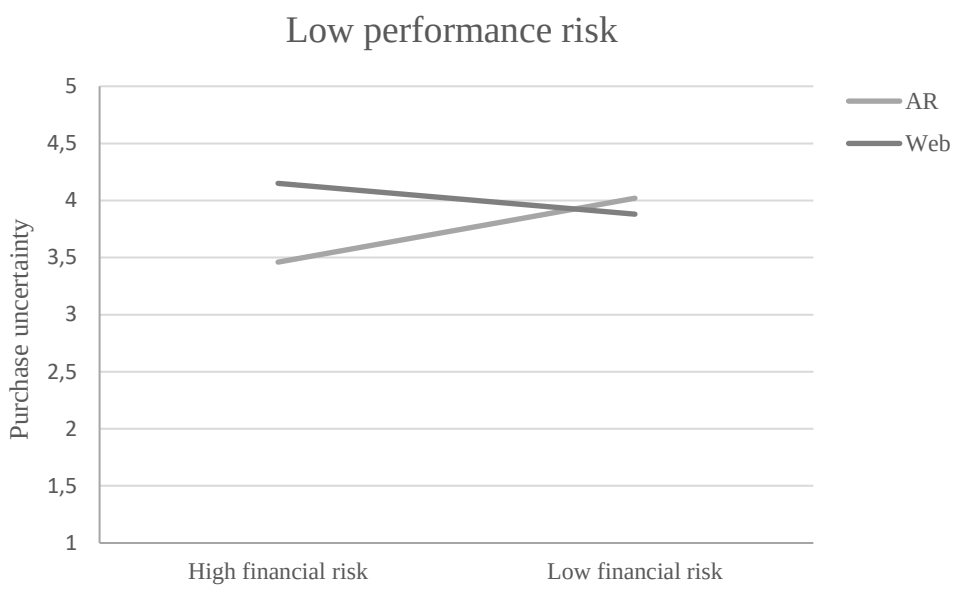

Figure 4b: Mean purchase uncertainty as function online shopping, performance risk and financial risk

Purchase intention

An ANOVA with purchase intention as dependent variable discovered again that the assumed main effect of online shopping on the dependent variable was not significant ($F(1.235) = 1.50$, $p = .223$). The outcome indicated that hypothesis 2, the level of purchase intention is higher of online shoppers that use AR technology compared to the online shoppers without AR technology, was not supported. However, the ANOVA revealed that the independent variable financial risk reached a significant main effect on purchase intention ($F(1.235) = 8.52$, $p = .004$, $\eta^2 = .04$), showing that people are less inclined to purchase the coffee machine when the financial risk is high as opposed to when it is low ($M = 4.41$, $SD = 1.22$ versus $M = 4.85$, $SD = 0.95$). Additionally, there was also a significant main effect between performance risk and purchase intention ($F(1.235) = 4.30$, $p = .04$, $\eta^2 = 0.02$), which demonstrated that the intention to buy the coffee machine is higher when the product has high performance risk compared to low risk ($M = 4.78$, $SD = 0.97$ versus $M = 4.48$, $SD = 1.22$). Moreover, the conducted ANOVA did not reveal any statistically interaction effects between the

independent variables and the dependent variable purchase intention (financial risk X performance risk: $F(1.235) = 1.48$, $p = .225$; financial risk X online shopping: $F(1.\ 235) = .01$, $p = .930$; performance risk X online shopping: $F(1.235) = .33$, $p = .564$; financial X performance X online shopping: $F(1.\ 235) = 0.64$, $p = .424$). The hypothesized interaction (H4b), shopping online with AR has a greater effect on purchase intentions when the financial risk perception is high as opposed to when the financial risk perception is low, was not supported. Likewise, the data did not support hypothesis 5b, for that reason it can be concluded that shopping online with AR does not have a greater effect on purchase intentions when the performance risk perception is high as opposed to when the performance risk perception is low.

Even though, the interaction between performance risk and online shopping was not significant, the mean scores of the interaction effect align with the assumed hypothesis, in which shopping with AR for a high performance risk product has a greater effect on consumers' purchase intention ($M = 4.75$, $SD = 1.04$ versus $M = 4.35$, $SD = 1.30$) as opposed to low performance risk.

Satisfaction

The ANOVA analysis with satisfaction as the dependent variable revealed that online shopping did not have a significant effect $F(1.235) = 1.69$, $p = .194$). This confirms that hypothesis 3a was not supported, customers' satisfaction is not higher when they use AR when shopping online as opposed shopping online without AR. The main effect of financial risk as independent variable on satisfaction was also not significant $F(1.235) = 1.22$, $p = .270$). Yet, the ANOVA test revealed a significant main effect of performance risk ($F(1.235) = 5.41$, $p = .021$, $\eta^2 = 0.02$), showing that people would be more satisfied when performance risk is high as opposed to low ($M = 5.08$, $SD = 1.19$ versus $M = 4.68$, $SD = 1.32$).

The following interaction effects were also not significant (performance risk X online shopping: $F(1.235)= 1.87$, $p = 0.173$; & performance risk X financial risk: $F(1.235) = .01$, $p = .943$). On the other hand, a significant interaction effect emerged between shopping online and financial risk ($F(1.235) = 7.16$, $p = .008$, $\eta^2 = 0.30$). A pairwise comparison (see Fig. 4) show that participants within the high financial risk condition preferred the availability of AR technology ($M_{AR} = 5.11$, $SD = 1.25$, $p = .006$). Whereas within the low financial risk condition the difference between AR and web was not significant ($M_{AR} = 4.64$, $SD = 1.29$, $p = .327$; $M_{web} = 4.95$, $SD = 1.18$, $p = .327$). Furthermore, within the with AR condition, the difference between financial risk (i.e., high vs low) perceptions was not significant ($M_{HF} = 5.11$, $SD = 1.25$, $p = .256$; $M_{LF} = 4.90$, $SD = 1.24$, $p = .327$), whereas within the standard web condition, low financial risk increased satisfaction ($M_{LF} = 5.08$, $SD = 1.09$, $p = .01$).

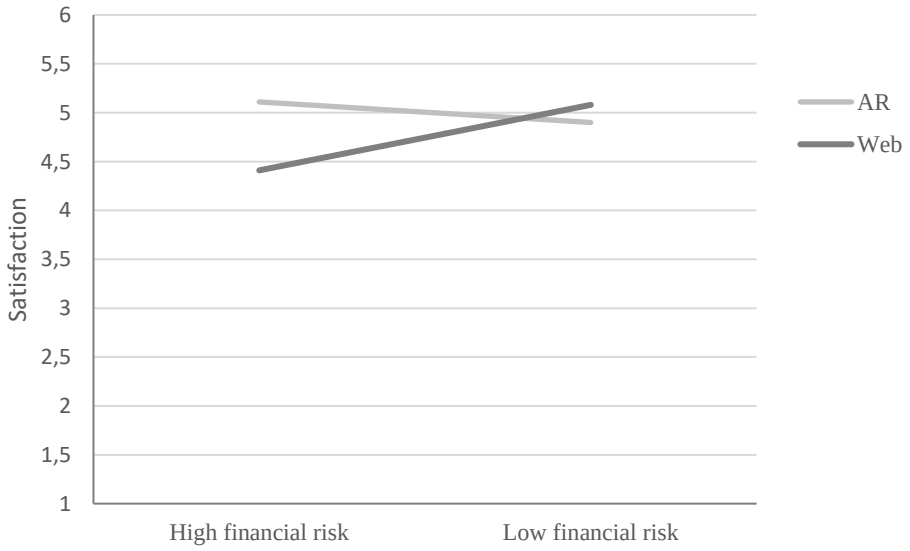

Figure 4:Mean satisfaction as a function of online shopping and financial risk

The ANOVA revealed a marginal significant three-way interaction between performance risk, financial risk, and online shopping ($F(1.235) = 3.71$, $p = .055$, $\eta^2 = 0.02$). As shown in Fig. 5a., the difference between high financial risk and low financial risk is minimum, therefore,

AR had no effect on financial risk perceptions when performance risk perceptions were high. In Fig. 5b., AR had an effect with high financial risk perceptions but this effect depended on low performance risk. Furthermore, with low performance risk the functioning of AR was negative.

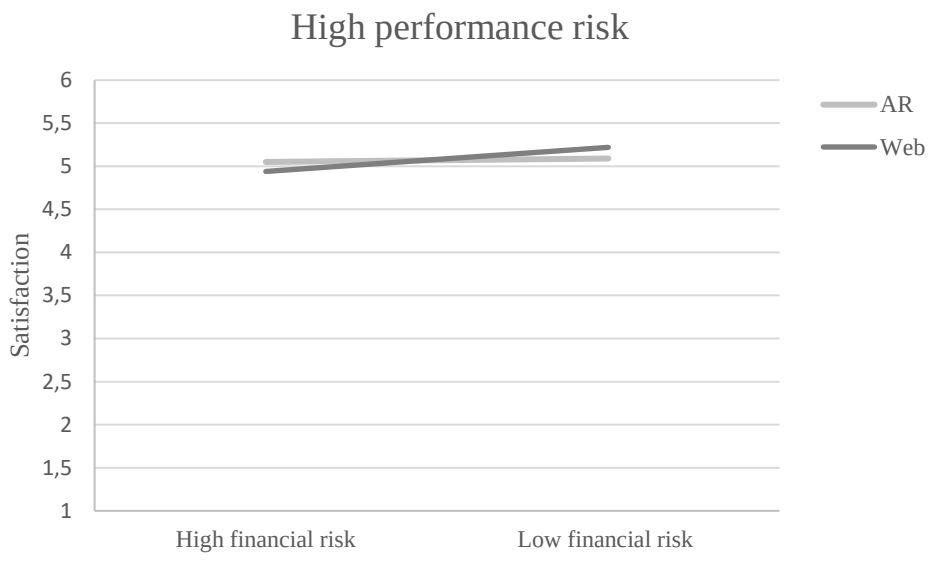

Figure 5a: Mean satisfaction as a function of online shopping, financial risk and performance risk

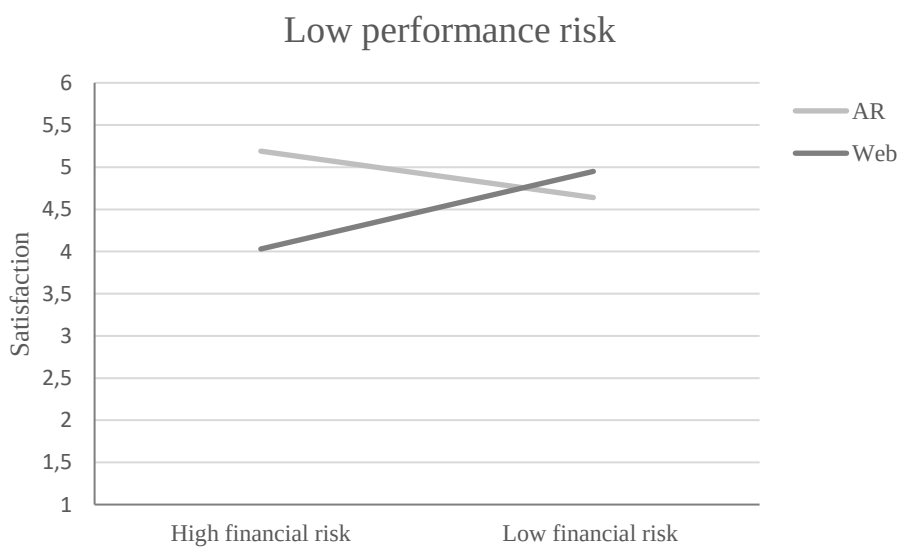

Figure 3b:Mean satisfaction as a function of online shopping, financial risk and performance risk

Evaluation

An ANOVA with evaluation as dependent variable did not reveal a significant effect of online shopping ((F(1.235) = .51, p = .474). The results did confirm that hypothesis 3b was not supported, and therefore, it can be stated that shopping with AR does not result in higher levels of satisfaction when shopping online. The non-predicted main effect of financial risk on evaluation was also not significant (F(1.235) = .03, p = .856). However, a strong, significant main effect of performance risk emerged (F(1.235) = 18.95, p <.001, η^2 = .08), indicating that high performance risk resulted in higher evaluation scores compared to low performance risk (M = 4.58, SD = 1.01 versus M = 3.93, SD = 1.18).

In addition, for evaluation as dependent variable, the interaction effect between online shopping and financial risk was not significant (F(1.235) = .03, p = .515), and neither was the interaction between financial risk and performance risk (F(1.235) = .01, p = ,920). The interaction between online shopping and performance risk was marginal statistically significant (F (1.235) = 3.17, p = .076, η^2 = .01). The pairwise comparison (see Fig. 6) demonstrated that the difference between online shopping with AR and without AR, within the high performance risk condition was not significant (M_{AR} = 4.52, SD = 1.06, p = .457 versus $M_{web,}$ = 4.66, SD = .94, p = .457). Whereas, the low performance risk condition induced greater scores with the availability of AR technology, which was marginally significant (M_{AR} = 4.14, SD = 1.23, p = .076 versus M_{web} = 3.76, SD = 1.26, p = .076). Furthermore, within the online shopping condition stressing "without AR", high performance risk yielded higher evaluation scores (M_{HP} = 4.66, SD = .94, p <.001 versus M_{LP} = 3.76, SD = 1.15 ,p = <.000). However within the with AR condition, low performance risk resulted in higher evaluation ratings, which was marginally significant (M_{LP} = 4.14, SD = 1.23, p = 0.06 versus M_{HP} = 4.52 SD = 1.06, p = <.001).

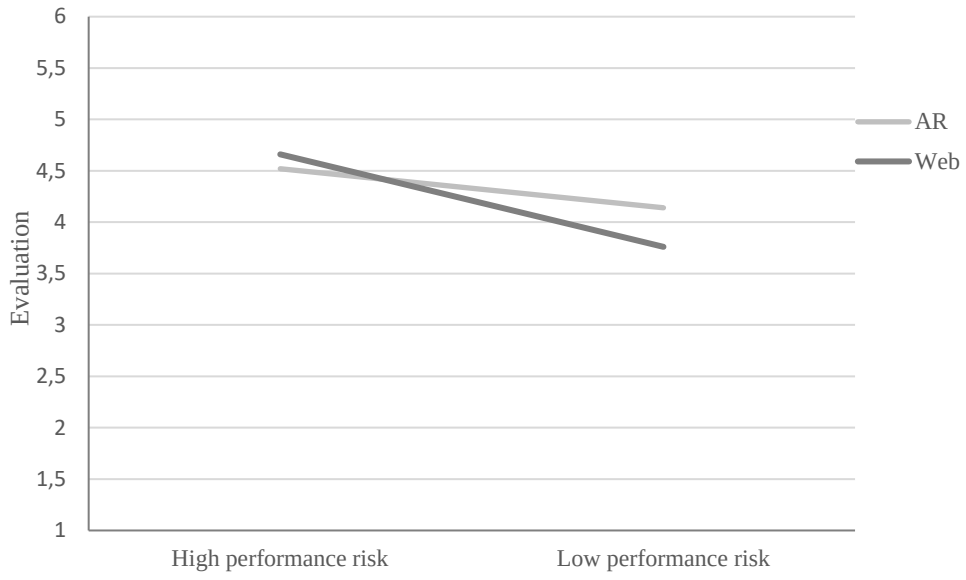

Figure 4: Mean evaluation as a function of performance risk and online shopping

Interactivity

The main effect of online shopping was again not significant ($F(1.235) = 2.08$, $p = .151$), which certify that the assumed hypothesis 4c (AR technology increases consumers' online shopping interactivity as opposed to shopping online without AR technology) was not supported. The main the effect of financial risk on interactivity was also not significant ($F(1.235) = .32$, $p = .572$). The main effect of performance risk was significant ($F(1.235) = 6.21$, $p = .013$, $\eta^2 = .03$), demonstrating that high performance risk led to higher expectations of interactivity with the product when shopping online as opposed to low performance risk ($M = 4.75$, $SD = 1.14$ versus $M = 4.35$, $SD = 1.12$).

None of the two-way interaction effects were significant (online shopping X financial risk: $F(1.235) = .73$, $p = .395$; online shopping X performance risk: $F(1.235) = 1.52$, $p = .219$; financial risk X performance risk: $F(1.235) = .40$, $p = .528$). Yet, three-way interaction between online shopping, financial risk, and performance risk did reach a significant effect ($F(1.235) = 5.86$, $p = .016$, $\eta^2 = .02$). As shown in Fig. 7a., the effect of shopping online with

AR did not have strong influence when participants perceived financial risk (high or low),and high performance risk. However, as illustrated in Fig 7b., AR had an effect on participants' interactivity but that was solely within the high financial risk condition while also perceiving low performance risk perceptions.

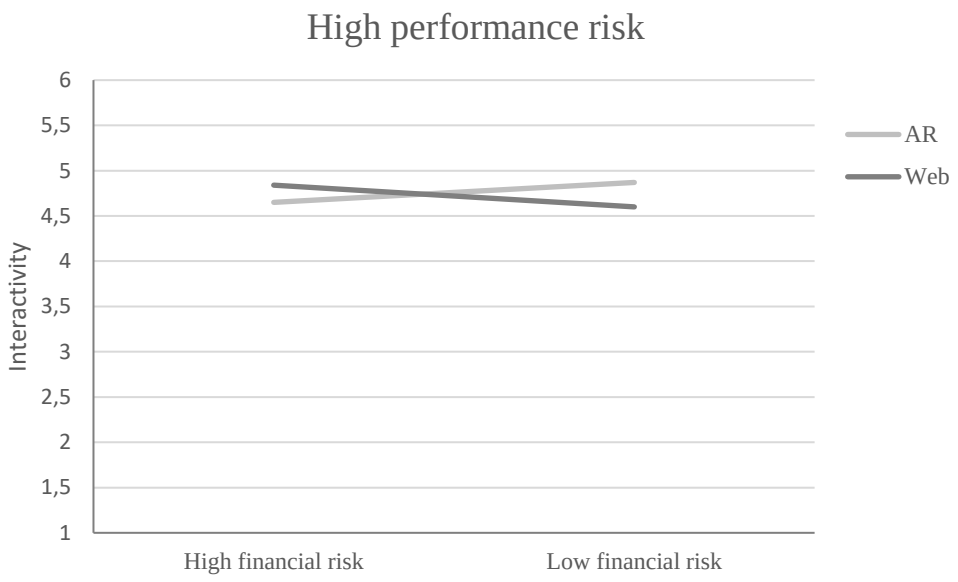

Figure 5a: Mean interactivity as a function of online shopping, performance risk and financial risk

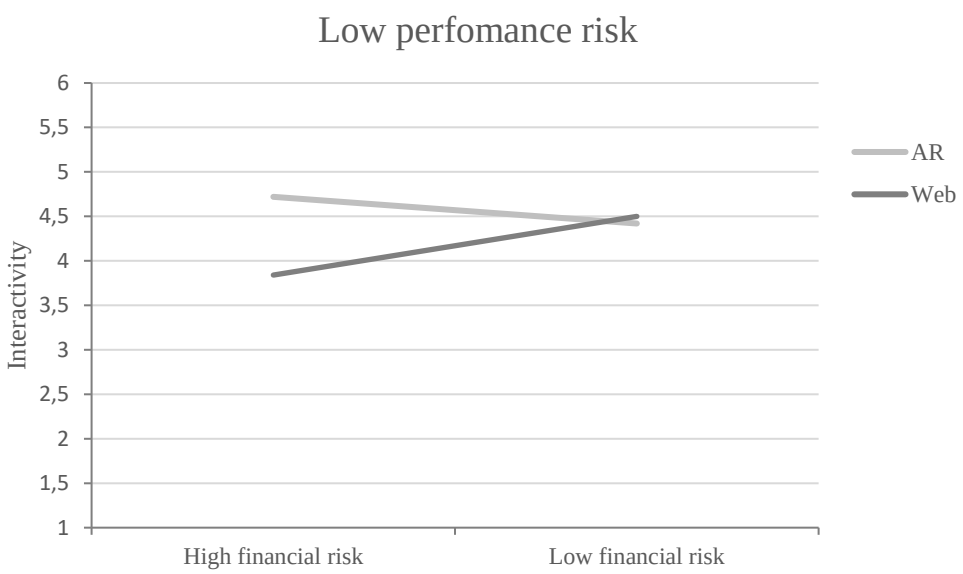

Figure 7b: Mean interactivity as a function of online shopping, performance risk

Discussion

The main objective of this study was to examine if shopping with the availability of AR technology could affect people's purchase uncertainty, purchase intention, satisfaction, evaluations, and interactivity, while also considering their financial and performance risk perceptions.

The results indicate that online shopping with AR does not have a main effect on consumers' purchase uncertainty, which is not in line with the hypothesis. This finding contradicts the findings of others (Olsson et al., 2012; Javornik, 2016) that claim AR reduces consumers' purchase uncertainty because it provides consumers with relevant detailed information as well as clear visualizations of the product. A plausible explanation could be that based on what the with AR condition participants have seen, they might think that the online shopping experience with AR may not be that different from an online shopping experience without AR.

The hypothesized interaction effect between AR and performance risk on purchase uncertainty was not significant. This result indicates that consumers' purchase uncertainty does not decrease when consumers perceive high performance risk perceptions with the availability of AR. A possible explanation could be that high performance risk may not have been perceived as high in risk in this study. The difference between the high risk and low performance risk conditions was that the participants within the high performance risk condition had more bullet points that stated the product specifications. This was done because previous work linked complexity/multiple functions and technological products to high-risk perceptions (Bhatnagar, Misra & Rao, 2000; Lee & Huddleston, 2006; Lowe, 2010). However, it may be possible that the participants read the product specifications but instead of

observing high performance risks perceptions of the product they perceived the product functionalities as benefits of what the product has to offer.

Findings demonstrated, although not theorized, that performance and financial risk perceptions combined with AR influence the purchase uncertainty of consumers. Within the low financial, high performance risk with AR condition the findings indicated particularly low ratings of purchase uncertainty. Additionally, the findings show that low performance risk and high financial risk with AR resulted in less purchase uncertainty, as opposed to low performance risk and high financial risk without AR. A probable explanation of why AR decreased purchase uncertainty could be that consumers first perceive high levels of financial risk, which may dominate the present perceptions of performance risk factors (Rompay, Finger, Saakes, & Fenko, 2017). Furthermore, previous studies (e.g., Roselius,1971; Taylor, 1974; Dacko, 2017; Yim, Chu & Sauer, 2017) showed that AR is capable to decrease consumers' purchase uncertainty, especially when consumers perceive high risks. However, as stated above, within the high performance risk, low financial risk and, with AR condition participants purchase uncertainty may have decreased because they perceived product benefits and AR would function as an enjoyable/valuable tool to demonstrate these benefits (Hilken et al, 2017).

Results of this study demonstrated that AR appears to be important for financial risk perceptions; especially for high financial risk perceptions. The effect on satisfaction was strong with AR as opposed to high financial risk without AR. Arguably these findings not only indicate that AR is a useful technology when financial risk perceptions are high but also people's online shopping experience becomes more enjoyable with high financial risk perceptions. Moreover, the results suggest that not only the relationship between high performance risk, high financial risk and AR, but also the interplay between low performance risk, high financial risk ,and AR can increase people's satisfaction. These findings correspond

with the described results of previous literature (Johnson et al., 2008, Oliver, 1997, Dacko, 2017) that measures such as AR can reduce risk perceptions which influence people's satisfaction levels in a positive manner.

Not as assumed, the interaction between performance risk and AR shows that participants' ability to evaluate a product in more detail enhances. The interaction effect occurred when participants perceived low performance risk with AR, as opposed to the participants who perceived high performance risk with AR. A probable interpretation could be that the number of product specifications within the low performance risk condition is lower than within the high risk condition, which makes it less difficult to formulate evaluations especially with the use of AR. This explanation would be in line with the studies of Mayer (2014) and Mirbabaie et al. (2019), who claim that AR is a technology that can reduce the cognitive load off consumers because AR can visualize the product in real-life environments, which increases consumers' ability to process information. Thus, within the low performance risk condition, AR's effect is greater because participants have to process less information which will be done more efficiently due to AR.

Another finding demonstrates that the relation between AR, performance risk and financial risk influence peoples' need to be interactively involved with the online purchase. Particularly, consumers need to have an interactive experience when they either have high financial risk or high performance risk perceptions with the ability to use AR. It is possible that participants who perceived high risk perceptions needed more information which could elicit the urge to become interactively involved with the product with the help of AR. This explanation would correspond with the previous study of Howard, Hamilton, and Hewer (2017) who underline the importance of consumers to be interactive with the product. Furthermore, according to Scholz and Smith (2016), AR is a technology that offers consumers

an online shopping experience in which consumers gain more knowledge through an interactive manner.

Implications

For other theorists, these results provide additional insights into the use of AR when shopping online while also taking into account consumers' risk perceptions. Consumers' risk perceptions has a vital influence on the relation between online shopping with AR and consumers' purchase uncertainty, satisfaction, evaluation and interactivity. Furthermore, this study included two types of risk perceptions simultaneously (i.e., performance risk and financial risk) but in different gradations (i.e., high or low) depending on the condition. As far as research has shown no study has included the risk perceptions of consumers when measuring the influence of AR on different dependent variables. For that reason, this study has successfully identified the mediating influence of risk perceptions. Other theorists could build on this research by investigating what other mediating factors besides perceived performance and financial risk could mediate the relation between AR and other dependent variables. In addition, this study could provide insights for other researchers to investigate more in-depth the benefits of AR during online shopping within several product categories and with different types of risk perceptions. Thus, future researchers could add other variables to the proposed model (see figure 1) to provide a broader understanding of the effects that AR could have on consumers as well as brands (e.g., loyalty) while shopping online.

For practitioners, The findings of this research could assist online brand marketers to develop an online shopping experience that is more consumer-friendly. Brands that would incorporate AR in their online webshop would benefit from it. For instance, when a brand offers a product online that is perceived as high in financial risk and/or performance risk AR could increase the level of satisfaction because with the AR technology online shopping becomes more enjoyable. According to a study by Kim, Fiore, and Lee (2007) enjoyment during online

shopping increase consumers' willingness to stay on the website, this may result in several additional beneficial outcomes such as more purchases by the consumer or positive word-of-mouth.

AR helps consumers make detailed evaluations of the wanted product, particularly with low performance risk or low performance risk and high financial risk. The better the customer can evaluate the product, the more certain they become about the decision to purchase the product online (Oh, Yoon, & Shyu, 2008). With AR, marketers would be able to offer consumers a more interactive experience in which consumers become more involved with the product, and get more attached to it. This study suggests that AR is advantageous to create an interactive online shopping experience for consumers when they perceive financial risk and performance risk perceptions. Especially in situations in which consumers have no other choice but to shop online, creating an interactive experience with AR would positively add to the brands' image.

Another reason why it is relevant to incorporate AR on online websites of brands is that online shopping is already perceived as something hazardous, which increases uncertainty. Performance risk and financial risk are two factors that contribute to uncertainty. However, this study revealed that AR combined with performance risk and financial risk can decrease uncertainty because consumers receive more information, and therefore, become more certain about the product. The decision to purchase the product becomes easier when consumer are more certain about the product.

Limitations and future research

This study has encountered some limitations that can be used as motivation for future research. For instance, the initial proposed idea to collect data was an experiment in which participants would have been able to use the AR function of the "Whole latte love" website, however, due to a global health pandemic (COVID-19) this was not possible. Therefore, an

online survey substituted the originally proposed data collection method to conduct an experiment. This may have influenced some outcomes of the research such as interactivity, product uncertainty, evaluation ,etc. because participants within the “with AR” condition had to look at an AR video demonstration of the coffee machine instead of being interactive with the AR function (e.g., walk around the product or zoom in on it). For future researchers, it is advisable to conduct an experiment because only then can participants interact with the AR functions and get a better understanding of the insights of the technology’s benefits. Consequently, it should provide researchers with results that are more valuable since the interactive in-person experiment would be the most appropriate way to simulate a consumer’s online product purchase experience.

The manipulation of performance risk may not have functioned in this study because the study showed some unexpected outcomes. It is plausible, as stated earlier, that participants misinterpreted the listed product specifications by perceiving them as product benefits. It is, therefore, worthwhile to investigate thoroughly what aspects during online shopping could increase performance risk, and how it should be presented to the participant e.g. negative reviews about the functioning of the product. This could be useful because researchers would then be able to control the performance risk perceptions and take the most appropriate decision of what would be needed to enhance high performance risk perceptions among participants. Subsequently, participants would probably not be able to perceive the stated product functionalities as benefits or develop other misconceptions of product performance risk.

Furthermore, it is plausible that consumers who have more experience with online shopping are less susceptible to the stated risk perceptions. This may explain why some participants perceived less performance or financial risk perceptions even in high-risk conditions. Further research could investigate the relationship between consumers’ risk perceptions and

consumers' online shopping experience but also consider the consumers' knowledge of the used product within the research, and if AR is still valuable for certain types of consumers e.g., knowledgeable consumers. Lastly, follow-up research could conduct a usability test of different AR apps to investigate what aspects of the AR app people think are useful or provide a valuable addition to their online shopping experience.

Conclusion

On the whole, the results of this study did not illustrate the hypothesized effects but it did present some unexpected valuable outcomes that confirmed that AR should be implemented more in consumers' online shopping experience. This study suggests that AR is especially effective when its influence on purchase uncertainty, satisfaction, evaluation ,and interactivity is mediated by either financial risk, performance risk, or both. For example, the results indicated that satisfaction increases when consumers perceive high financial risk with the availability of AR. This demonstrates AR's contribution to consumers online shopping experience in which the consumer can enjoy their time online.

Furthermore, the results of the three-way interactions gave the impression that AR has a significant effect when the participants perceived at least one of the stated risk perceptions (i.e., financial risk or performance risk) as high. However, the performance risk manipulation may not have worked as intended because participants may have perceived the product specifications as benefits. This would be a call for much-needed research to establish what participants would perceive as performance risk.

The study could function as a basis for other academics to further investigate the potential of AR and the influence of not only perceived risk perceptions but also other mediating variables by conducting experiments. The outcome of this study also offers further insights for marketers which could support them with the development of a better online shopping

experience for consumers in which they have the option to use AR. Conclusively, AR is a win-win situation for marketers as well as customers, in which both parties will be satisfied because they would both benefit from the use and implementation of AR.

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Appendix 1: Pretest materials

The following images of five different products were created and the participants had to imagine they would like to purchase it on an online website.

Coffee machine inexpensive version

Coffee machine expensive version

Watch expensive version

TISSOT CLASSIC PR100 CHRONO T1019172215100

€ 515,00

Product details

This beautiful watch by Tissot the T1019172215100 is a watch with a quartz movement.

The watch has a diameter of 38 mm and is 11 mm thick. The time display is Analog.

Furthermore, the watch is fitted with a sapphire watch glass. The watch is 10 bar (swimming) waterproof and has a stainless steel strap in the color Silver

Watch inexpensive version

TISSOT EVERYTIME DESIRE T1094102203100

€ 515,00

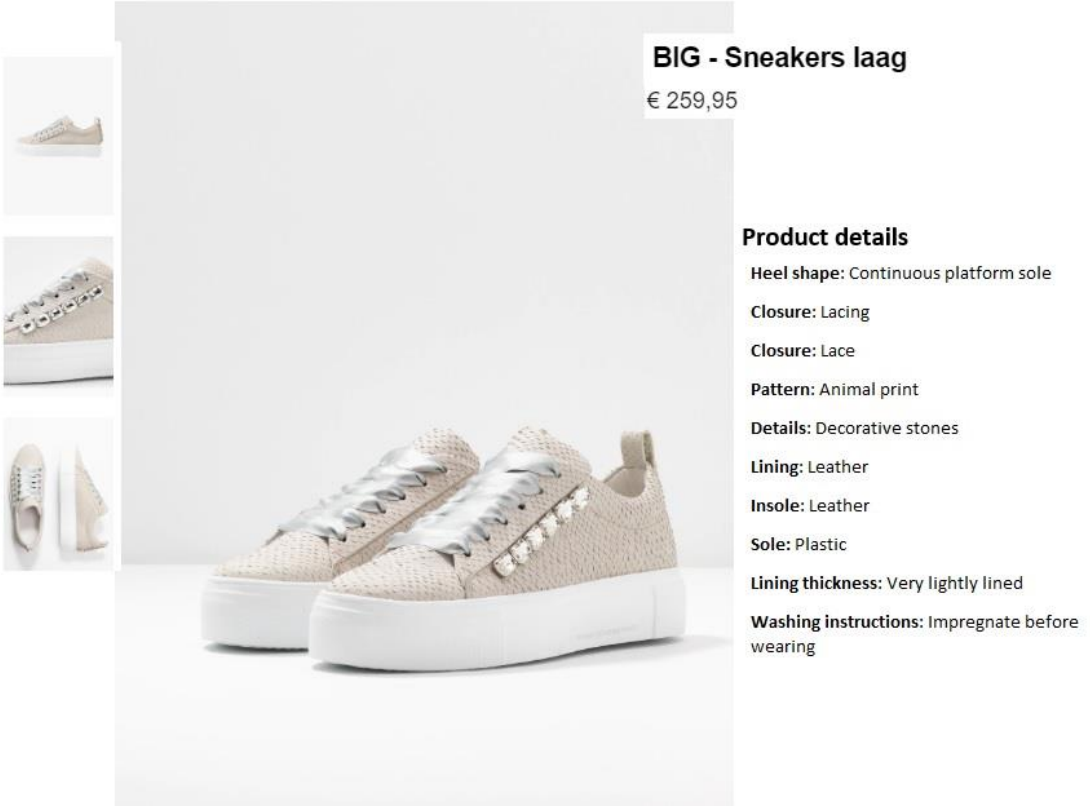
Product details

This beautiful watch by Tissot the T1094102203100 is a watch with a quartz movement.

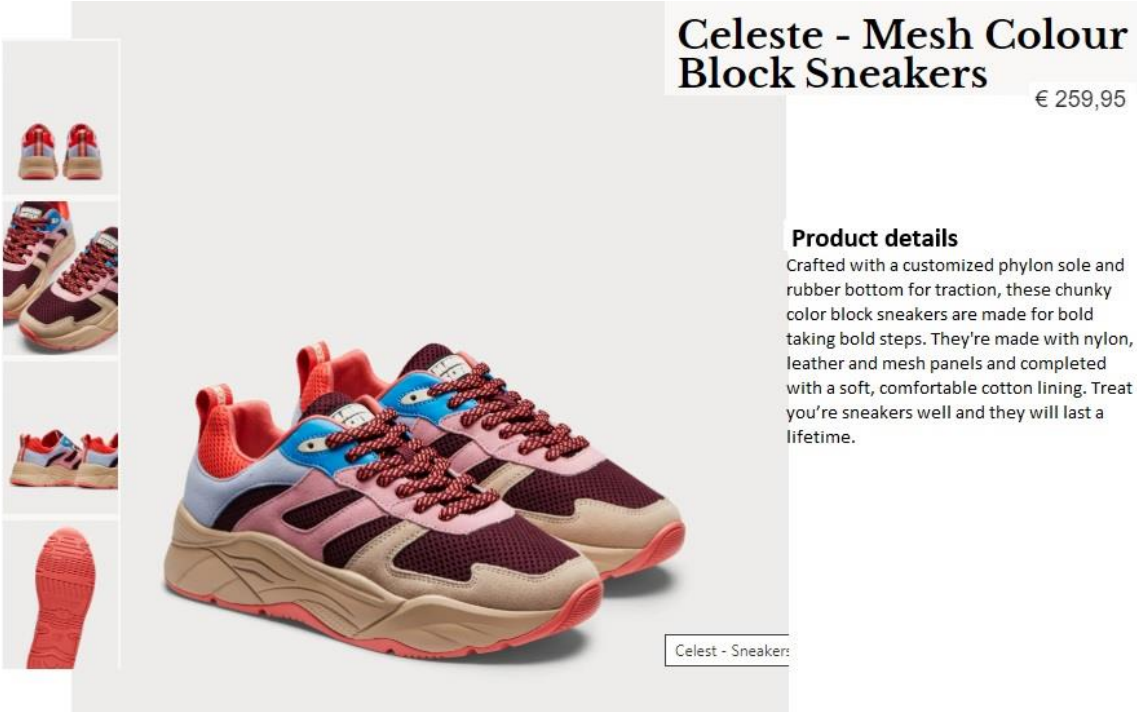
The watch has a diameter of 38 mm and is 12 mm thick. The time display is Analog.

Furthermore, the watch is fitted with a sapphire watch glass. The watch is 3 bar (splash) waterproof and has a stainless steel strap in the color Silver.

Shoes expensive version



Shoes inexpensive



Bathroom sink cabinet expensive version

Product information

Cleaning the floor is a breeze since this solution is wall mounted and there are no legs that get in the way.

The smooth-running drawers with pull-out stop, open all the way for a good overview without falling out.

You can sense the calm every time you close the drawers thanks to the soft-closing mechanism. No worries about fingers getting trapped.

GODMORGON / ODENSVIK €245.80

63x49x64 cm

Bathroom sink cabinet inexpensive version

Product details

Mixer tap and strainer are included.

The steel legs ensure that the cabinet stands stable and are of stainless steel

LILLÅNGEN/VISKAN / GUTVIKEN €245.80

82x40x92 cm

Microwave expensive version

Samsung MC28M6055CK/EN 205,-

Product description
The Samsung MC28M6055CK/EN combi microwave isn't just suitable for heating up meals, but for grilling, baking, and frying as well. The HotBlast technology shortens the preparation time by half. The microwave blows a powerful stream of hot air directly at the food; your seasoned chicken cooks evenly and gets a crispy skin and a soft, juicy inside. Traditional microwave glass doesn't allow for peeking. With the Samsung combi microwave, you can. This way, you can keep an eye on your dish and prevent it from burning. Make your food extra crispy with the included crisper dish. Now select the pizza setting, and all of a sudden that frozen pizza looks way more tempting.

Physical properties.
Height: 31 cm
Width:51,7 cm
Depth: 47,48 cm

Microwave inexpensive version

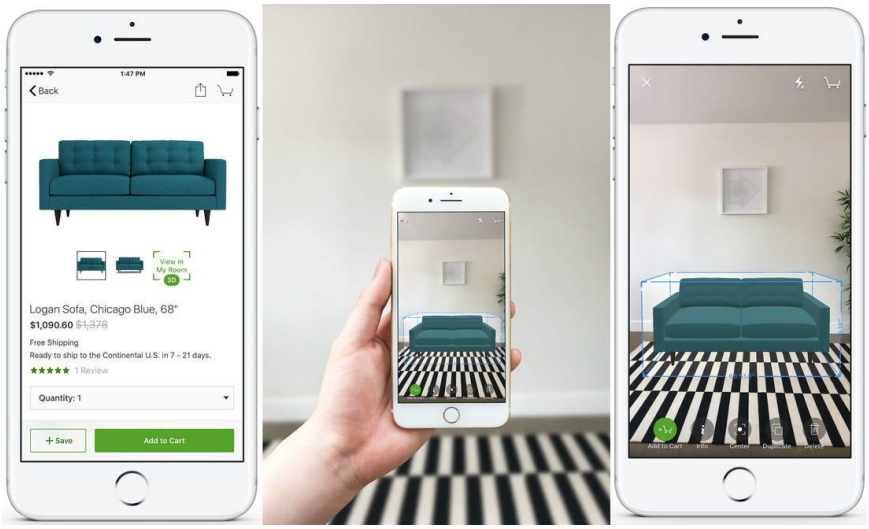
Inventum MN207S 205,-

Product description
The Inventum MN207S is a compact microwave that easily fits in a smaller kitchen. The 5 power settings can be used to warm your food with 1 of 8 automatic programs, making cooking easy. With this, you only need to enter what type of dish you want to heat and its weight. The microwave then automatically chooses the correct power and the correct preparation time. To defrost food, the microwave has a separate setting. The is useful if you forgot to take the meat out of the freezer but were planning to cook hamburgers for dinner. This means the burgers can still be fried in time. After use, the enamelled walls can be wiped clean with a cloth.

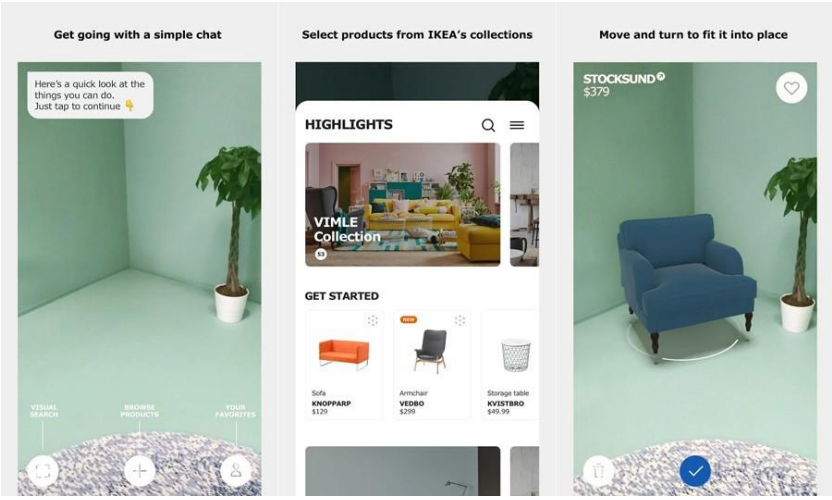
Physical properties:
Height: 26 cm
Width: 44 cm
Depth: 37 cm

The following images demonstrates AR apps that fit with the selected products of the pretest.

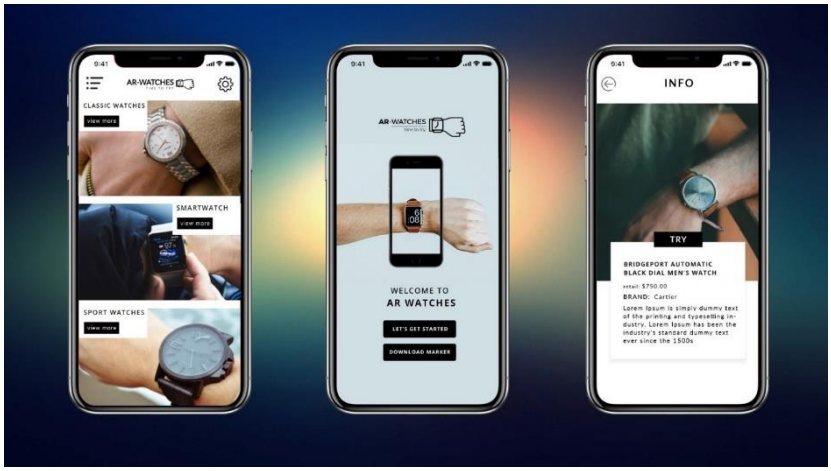
Houzz app



Ikea place



AR watch



Wanna kickcs

Appendix 2: Pretest results

Product performance risk: Coffee machine

Coffee machine (cheap)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	3.00	1.34
	The product has too much functionalities that can cause product failure	11	3.36	1.36
	The product will not perform to my satisfaction	11	4.09	1.14
	The product would likely need a lot of maintenance overtime	11	4.91	0.70
	It is hard to evaluate the product and its performance online, based on the image and product description	11	5.09	1.45
	The product would be too complex for me to use	11	4.73	1.74
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	5.73	0.79

Coffee machine (expensive)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	3.45	1.64
	The product has too much functionalities that can cause product failure	11	4.00	1.55
	The product will not perform to my satisfaction	11	3.09	1.04
	The product would likely need a lot of maintenance overtime	11	4.64	1.50
	It is hard to evaluate the product and its performance online, based on the image and product description	11	4.82	1.40
	The product would be too complex for me to use	11	4.27	1.56
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	5.18	1.54

Financial risk: Coffee machine

Coffee machine (expensive)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	4.82	1.54
	I would not purchase the product because the price is too high	11	5.45	1.29
	The product is overpriced	11	5.45	1.04
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	5.09	1.45
	The financial risk of purchasing this product online would be too high	11	5.45	1.23

Coffee machine (cheap)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	5.18	1.33
	I would not purchase the product because the price is too high	11	5.55	1.29
	The product is overpriced	11	5.36	0.92
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	5.55	0.69
	The financial risk of purchasing this product online would be too high	11	5.64	1.12

Product performance risk: Bathroom sink

Bathroom sink cabinet (expensive)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	3.09	1.70
	The product has too much functionalities that can cause product failure	11	2.27	1.35
	The product will not perform to my satisfaction	11	2.73	1.49
	The product would likely need a lot of maintenance overtime	11	3.18	1.60
	It is hard to evaluate the product and its performance online, based on the image and product description	11	3.18	1.54
	The product would be too complex for me to use	11	1.73	0.91
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	3.09	1.22

Bathroom sink cabinet (cheap)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	3.36	1.50
	The product has too much functionalities that can cause product failure	11	3.09	1.70
	The product will not perform to my satisfaction	11	2.73	1.10
	The product would likely need a lot of maintenance overtime	11	3.55	1.51
	It is hard to evaluate the product and its performance online, based on the image and product description	11	3.91	1.76
	The product would be too complex for me to use	11	2.09	1.04
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	3.91	1.87

Financial risk: Bathroom sink

Bathroom sink cabinet (expensive)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	3.91	1.81
	I would not purchase the product because the price is too high	11	4.09	1.87
	The product is overpriced	11	4.18	1.66
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	4.55	1.64
	The financial risk of purchasing this product online would be too high	11	4.09	1.70

Bathroom sink cabinet (cheap)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	4.18	1.78
	I would not purchase the product because the price is too high	11	4.45	1.81
	The product is overpriced	11	4.36	1.75
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	4.18	1.54
	The financial risk of purchasing this product online would be too high	11	4.55	1.51

Product performance risk: Watch

Watch (expensive)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	2.73	1.79
	The product has too much functionalities that can cause product failure	11	2.45	1.57
	The product will not perform to my satisfaction	11	2.64	1.12
	The product would likely need a lot of maintenance overtime	11	3.27	1.62
	It is hard to evaluate the product and its performance online, based on the image and product description	11	3.55	1.44
	The product would be too complex for me to use	11	2.64	1.36
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	3.82	1.33

Watch (cheap)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	3.55	1.57
	The product has too much functionalities that can cause product failure	11	2.09	0.83
	The product will not perform to my satisfaction	11	2.82	1.33
	The product would likely need a lot of maintenance overtime	11	2.82	1.33
	It is hard to evaluate the product and its performance online, based on the image and product description	11	4.36	1.50
	The product would be too complex for me to use	11	2.09	0.70
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	4.36	1.69

Financial risk: Watch

Watch (expensive)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	4.27	1.68
	I would not purchase the product because the price is too high	11	5.00	1.73
	The product is overpriced	11	5.27	1.74
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	5.09	1.70
	The financial risk of purchasing this product online would be too high	11	5.09	5.09

Watch (cheap)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	3.73	1.42
	I would not purchase the product because the price is too high	11	5.27	1.49
	The product is overpriced	11	4.91	1.22
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	4.73	1.42
	The financial risk of purchasing this product online would be too high	11	4.55	1.70

Product performance risk: Shoes

Shoes (expensive)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	2.36	1.21
	The product has too much functionalities that can cause product failure	11	2.36	1.36
	The product will not perform to my satisfaction	11	3.27	1.68
	The product would likely need a lot of maintenance overtime	11	3.82	1.66
	It is hard to evaluate the product and its performance online, based on the image and product description	11	3.91	1.58
	The product would be too complex for me to use	11	2.09	1.38
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	4.18	1.89

Shoes (cheap)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	3.45	2.16
	The product has too much functionalities that can cause product failure	11	2.00	1.41
	The product will not perform to my satisfaction	11	3.91	1.76
	The product would likely need a lot of maintenance overtime	11	4.09	1.87
	It is hard to evaluate the product and its performance online, based on the image and product description	11	3.73	1.90
	The product would be too complex for me to use	11	2.82	1.89
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	3.36	1.86

Financial risk: Shoes

Shoes (expensive)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	4.09	1.92
	I would not purchase the product because the price is too high	11	5.73	0.91
	The product is overpriced	11	5.64	1.03
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	5.73	1.01
	The financial risk of purchasing this product online would be too high	11	5.00	1.55

Shoes (cheap)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	4.45	2.07
	I would not purchase the product because the price is too high	11	6.00	0.45
	The product is overpriced	11	6.09	0.30
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	5.82	0.75
	The financial risk of purchasing this product online would be too high	11	5.64	1.43

Product performance risk: Microwave

Microwave (expensive)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	2.36	0.92
	The product has too much functionalities that can cause product failure	11	2.73	1.19
	The product will not perform to my satisfaction	11	3.64	1.63
	The product would likely need a lot of maintenance overtime	11	4.18	1.66
	It is hard to evaluate the product and its performance online, based on the image and product description	11	3.91	1.70
	The product would be too complex for me to use	11	3.55	1.44
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	4.36	1.80

Microwave (cheap)	Statements	N	Mean	Std. Deviation
	There is a large chance the product on the image would not perform as it should	11	3.27	1.56
	The product has too much functionalities that can cause product failure	11	3.55	1.44
	The product will not perform to my satisfaction	11	3.73	1.27
	The product would likely need a lot of maintenance overtime	11	4.45	1.37
	It is hard to evaluate the product and its performance online, based on the image and product description	11	4.73	1.35
	The product would be too complex for me to use	11	3.55	1.70
	I need to gain more knowledge about the displayed product in order to make better evaluations about the product performance	11	4.91	1.30

Financial risk: Microwave

Microwave (expensive)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	3.73	1.85
	I would not purchase the product because the price is too high	11	3.18	1.78
	The product is overpriced	11	3.18	1.54
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	4.09	1.97
	The financial risk of purchasing this product online would be too high	11	4.18	1.83

Microwave (Cheap)	Statements	N	Mean	Std. Deviation
	Based on the product information of the displayed product I cannot evaluate the product accordingly, and therefore I would not put my money at risk	11	3.64	1.69
	I would not purchase the product because the price is too high	11	4.27	1.42
	The product is overpriced	11	3.45	1.57
	The stated price would not be worth taking the risk of losing my money at the moment of purchase	11	3.82	1.60
	The financial risk of purchasing this product online would be too high	11	4.00	1.95

Augmented reality apps

App AR Watches	Statements	N	Mean	Std. Deviation
	This app will be of good quality based on the images	11	5.64	1.29
	With the use of this AR app I would be able to make better product evaluations	11	5.18	1.33
	This augmented reality app would be valuable when shopping online	11	5.73	0.79
	Based on the displayed images of the app, I could imagine that the app has the potential to provide a good augmented reality experience	11	5.45	1.57

App Wanna kicks	Statements	N	Mean	Std. Deviation
	This app will be of good quality based on the images	11	5.45	1.51
	With the use of this AR app I would be able to make better product evaluations	11	5.18	1.89
	This augmented reality app would be valuable when shopping online	11	5.18	1.66
	Based on the displayed images of the app, I could imagine that the app has the potential to provide a good augmented reality experience	11	5.18	1.60

App Ikea place	Statements	N	Mean	Std. Deviation
	This app will be of good quality based on the images	11	5.27	1.01
	With the use of this AR app I would be able to make better product evaluations	11	5.18	1.33
	This augmented reality app would be valuable when shopping online	11	5.73	0.79
	Based on the displayed images of the app, I could imagine that the app has the potential to provide a good augmented reality experience	11	4.73	1.56

App Houzz	Statements	N	Mean	Std. Deviation
	This app will be of good quality based on the images	11	5.09	1.76
	With the use of this AR app I would be able to make better product evaluations	11	5.36	1.69
	This augmented reality app would be valuable when shopping online	11	5.64	1.21
	Based on the displayed images of the app, I could imagine that the app has the potential to provide a good augmented reality experience	11	5.64	1.21

Product preference (extra check question)

Product	N	Frequency
Coffee machine	11	1
Shoes	11	2
Watch	11	1
Bathroom sink cabinet	11	6
Microwave	11	1

Price range categories within the max and minimum prices of a coffee machine

Minimum price category ranges	Min	Max	Mean
Coffee machine (expensive)	€ 20,00	€ 5.000,00	€ 540,00
Coffee machine (cheap)	€ 20,00	€ 5.000,00	€ 567,27

Maximum price category ranges	Min	Max	Mean
Coffee machine (expensive)	€ 60,00	€ 15.000,00	€ 1.561,82
Coffee machine (cheap)	€ 60,00	€ 5.000,00	€ 1.578,18

Appendix 3: Survey

Master thesis survey - Copy Official distribution

Start of Block: Default Question Block

InformedConsent Dear participant My name is Jalisa Trinidad and I am a Master student at the University of Twente, and I need to conduct a research as part of my master thesis. Therefore, you are invited to take part in this online research that is aimed to investigate consumers' perceptions and certain behaviors when they shop online for a product they are interested in. In this survey, you will be asked to read a brief scenario, have a close look at an image and/or video, and answer some questions. It will take approximately 8 minutes of your time to complete this survey.
If you have any questions or remarks regarding this survey send an email to: j.i.m.trinidad@student.utwente.nl

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InformedConsent Your participation is completely voluntary. However, if you feel not at ease to answer some questions you are free to withdraw from the survey at any moment. In addition, this study is completely anonymous, and your answers and identity will be strictly confidential. Your answers will solely be used for research purposes. If you have any remarks or complaints about ethical issues you can contact the Ethics Commission of UTwente via: ethicscommittee-bms@utwente.nl.
By giving your consent, you also confirm that you are 18 years of age or older..

○ I agree (1)

○ I do not agree (2)

Skip To: End of Survey If Your participation is completely voluntary. However, if you feel not at ease to answer some quest... = I do not agree

End of Block: Default Question Block

Start of Block: Demograpgics

Gender What gender do you identify as?

- ○ Male (1)
- ○ Female (2)
- ○ Other (3)

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*

Age What is your age?

_____

Education What is your highest level of education you have completed?

- ○ Less than high school (1)
- ○ High school graduate or equivalent (e.g., GED) (2)
- ○ Secondary vocational degree (MBO) (3)
- ○ Bachelor's degree (e.g., HBO/WO) (4)
- ○ Master's degree (5)
- ○ Doctorate degree (e.g., PhD/EdD) (6)
- ○ Other (7) _____

Shopping time How often do you shop online?

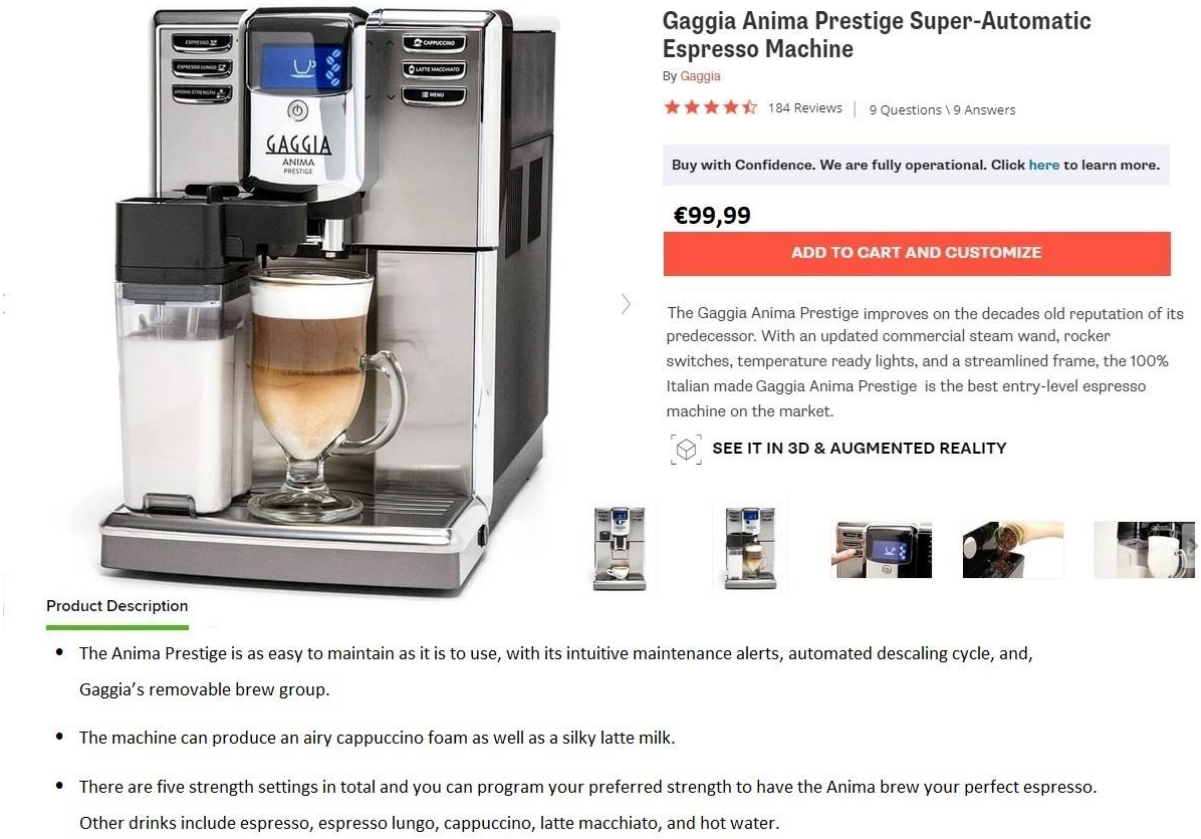
- ○ Extremely often (1)
- ○ Very often (2)
- ○ Moderately often (3)
- ○ Slightly often (4)
- ○ Not at all (5)

End of Block: Demographics

Start of Block: Condition8

Q47_BriefingCON8 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate your screen, if you cannot zoom in on the image).

Q48_ImageV_LFLPar

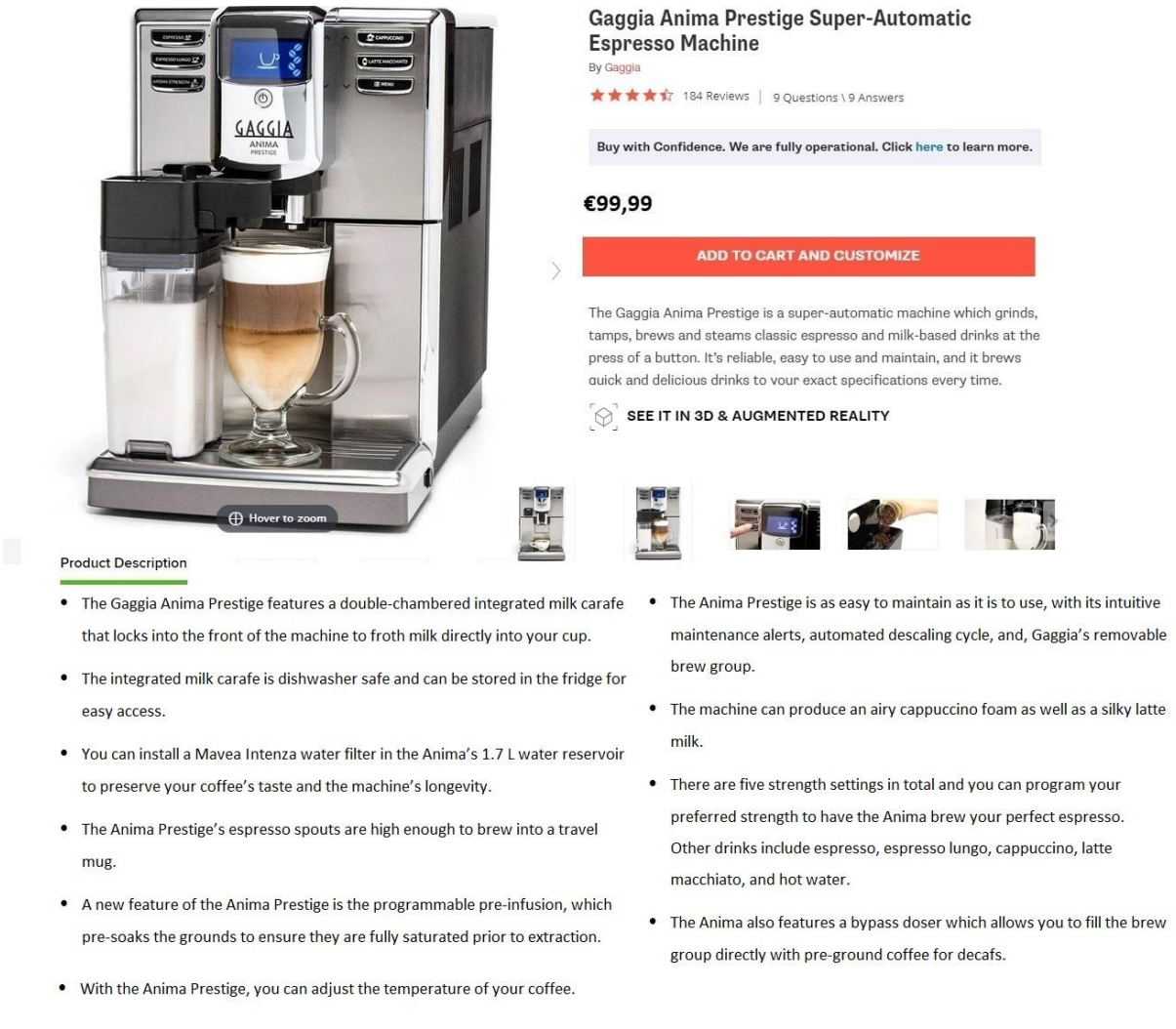


End of Block: Condition8

Start of Block: Condition7

Q44_BriefingCON7 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate your screen, if you cannot zoom in on the image).

Q45_ImageV_LFHPar

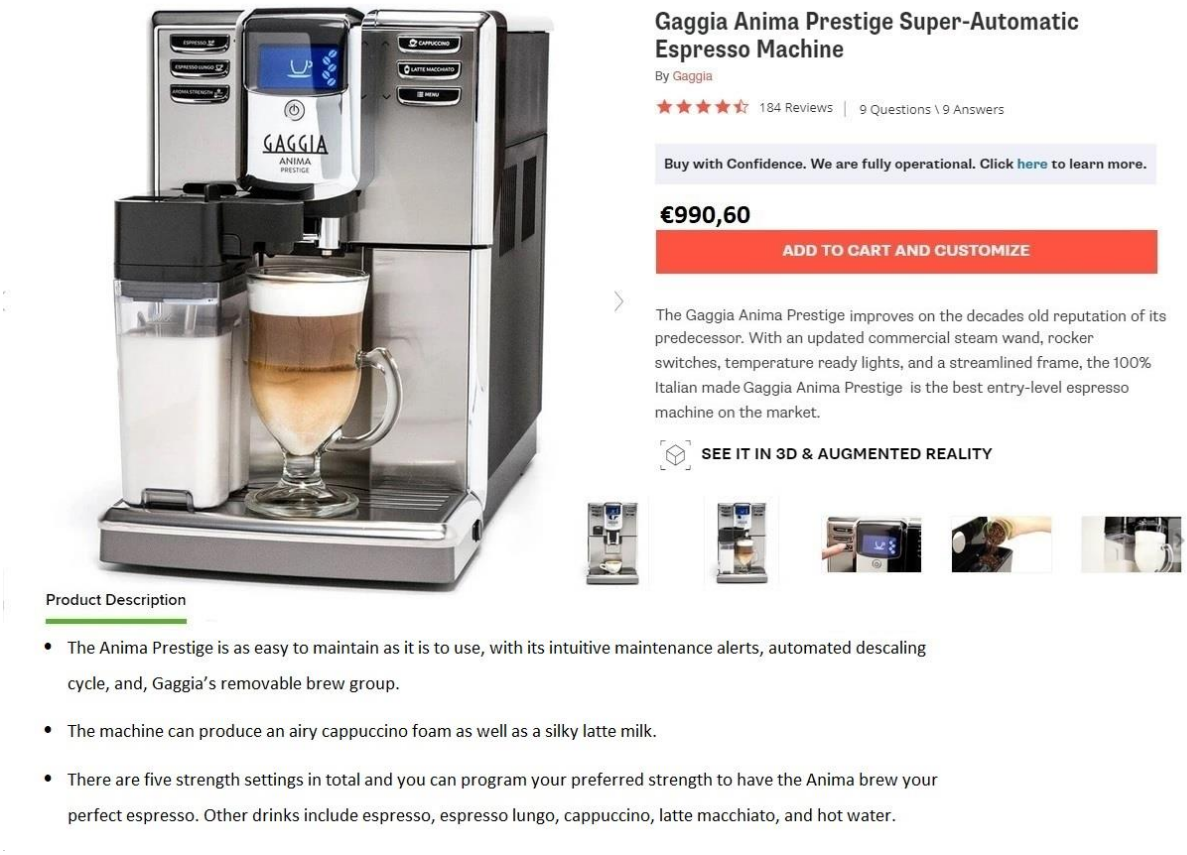


End of Block: Condition7

Start of Block: Condition6

Q41_BriefingCON6 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate your screen, if you cannot zoom in on the image).

Q42_IMAGEV_HFLPar

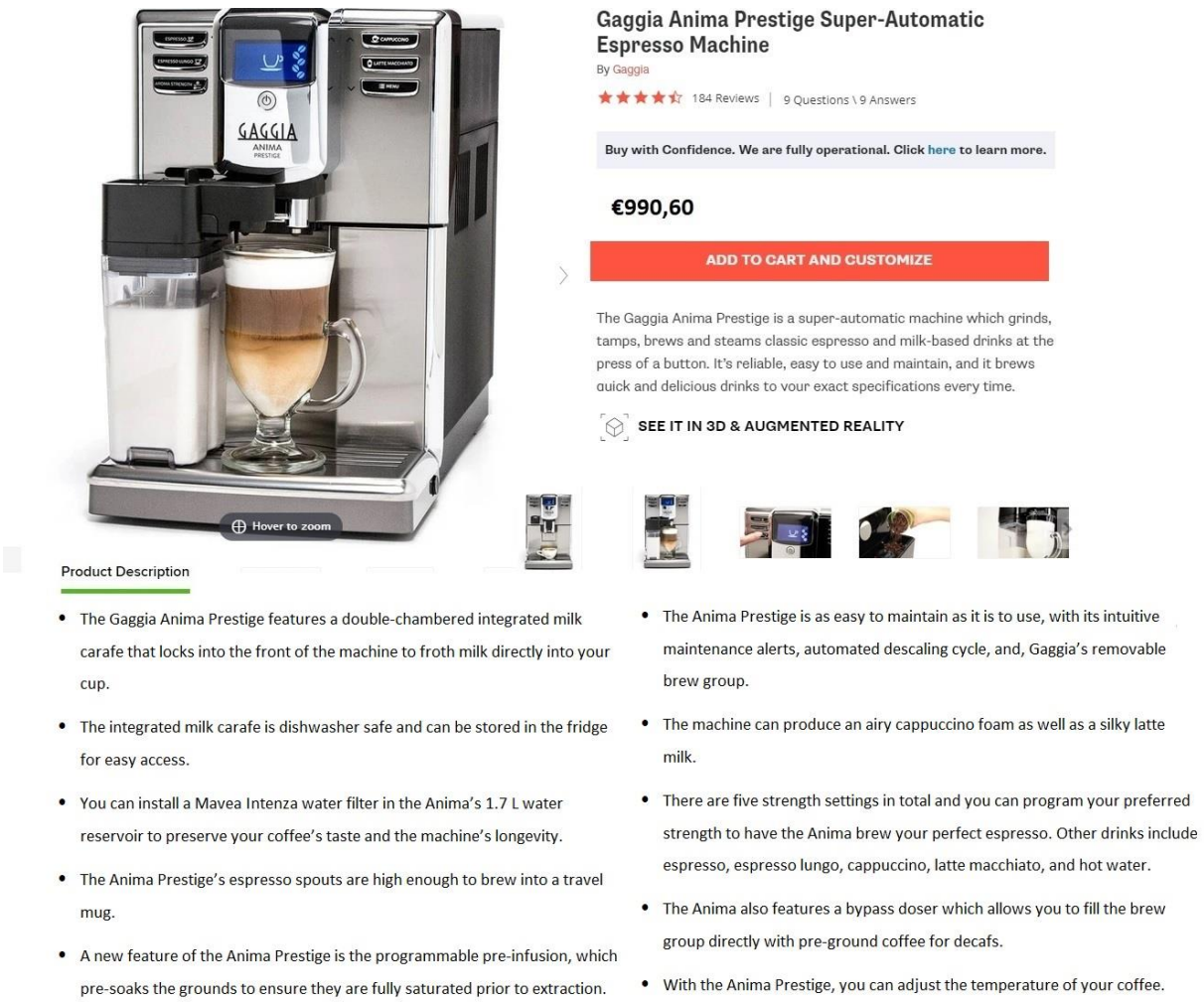


End of Block: Condition6

Start of Block: Condition5

Q38_BriefingCON5 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate your screen, if you cannot zoom in on the image).

Q39_ImageV_HFHPar

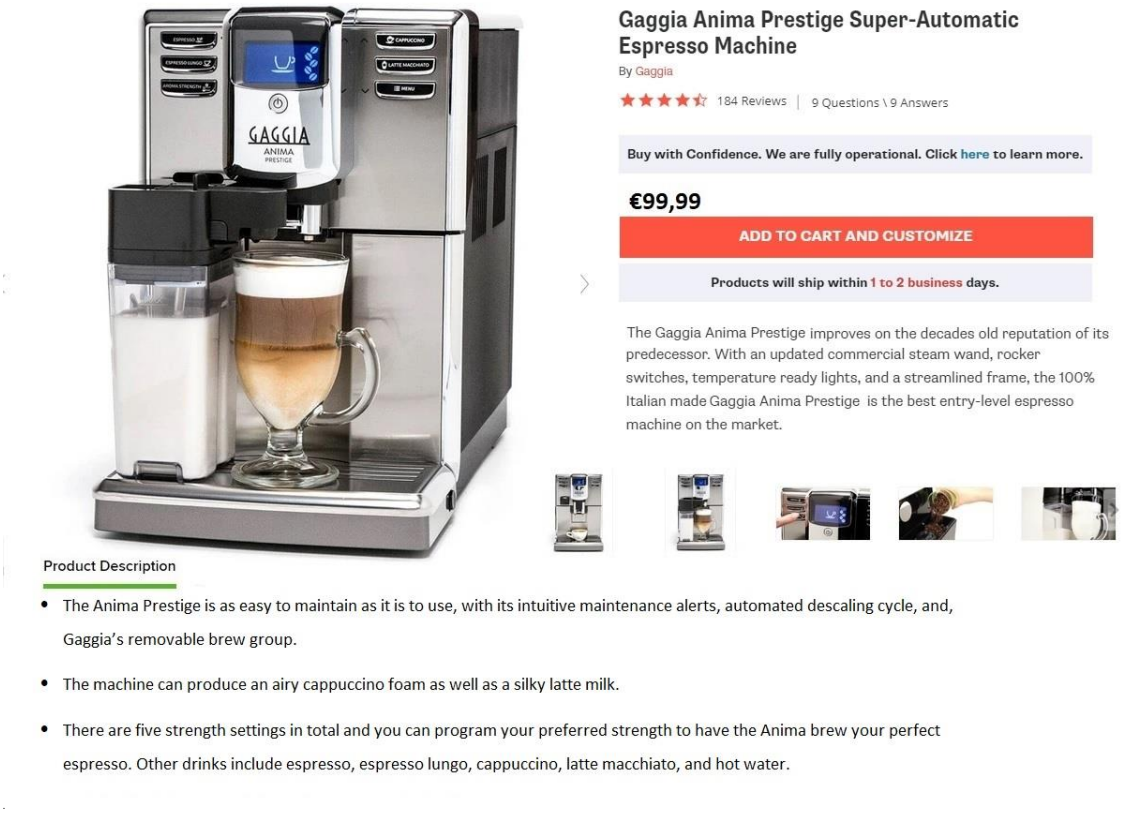


End of Block: Condition5

Start of Block: Condition4

Q35_BriefingCON4 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate your screen, if you cannot zoom in on the image).

Q36_Image_LFLP

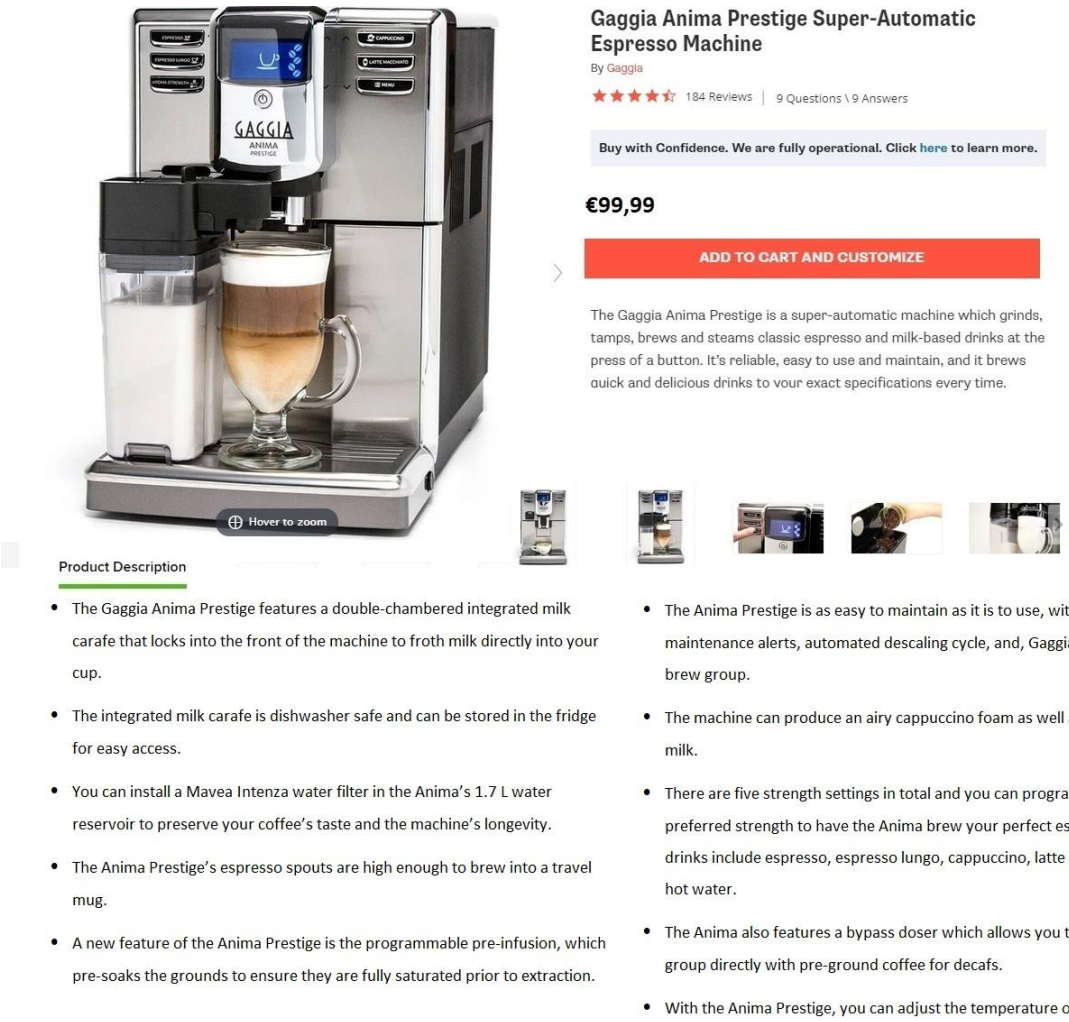


End of Block: Condition4

Start of Block: Condition3

Q32_BriefingCon3 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate your screen, if you cannot zoom in on the image).

Q33_Image_LFHP

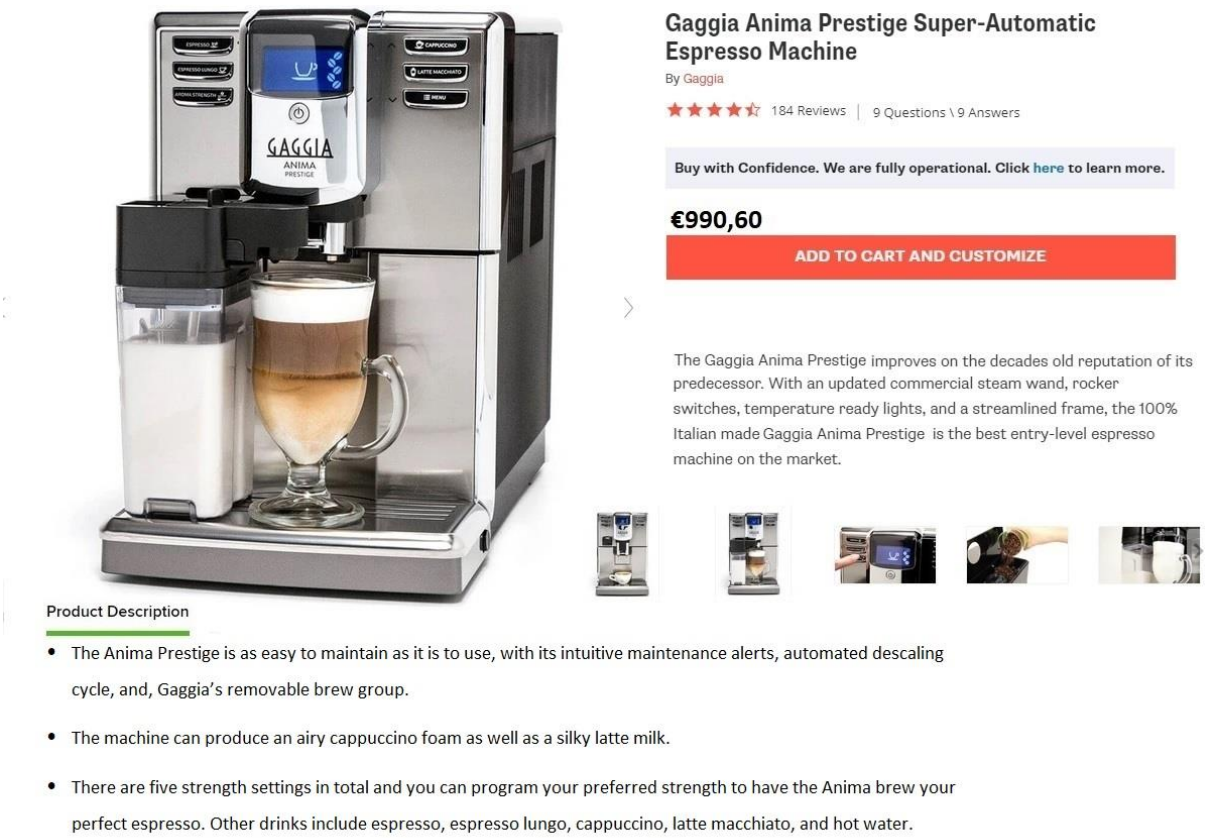


End of Block: Condition3

Start of Block: Condition2

Q29_BriefingCON2 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate your screen, if you cannot zoom in on the image).

Q30_Image_HFLP

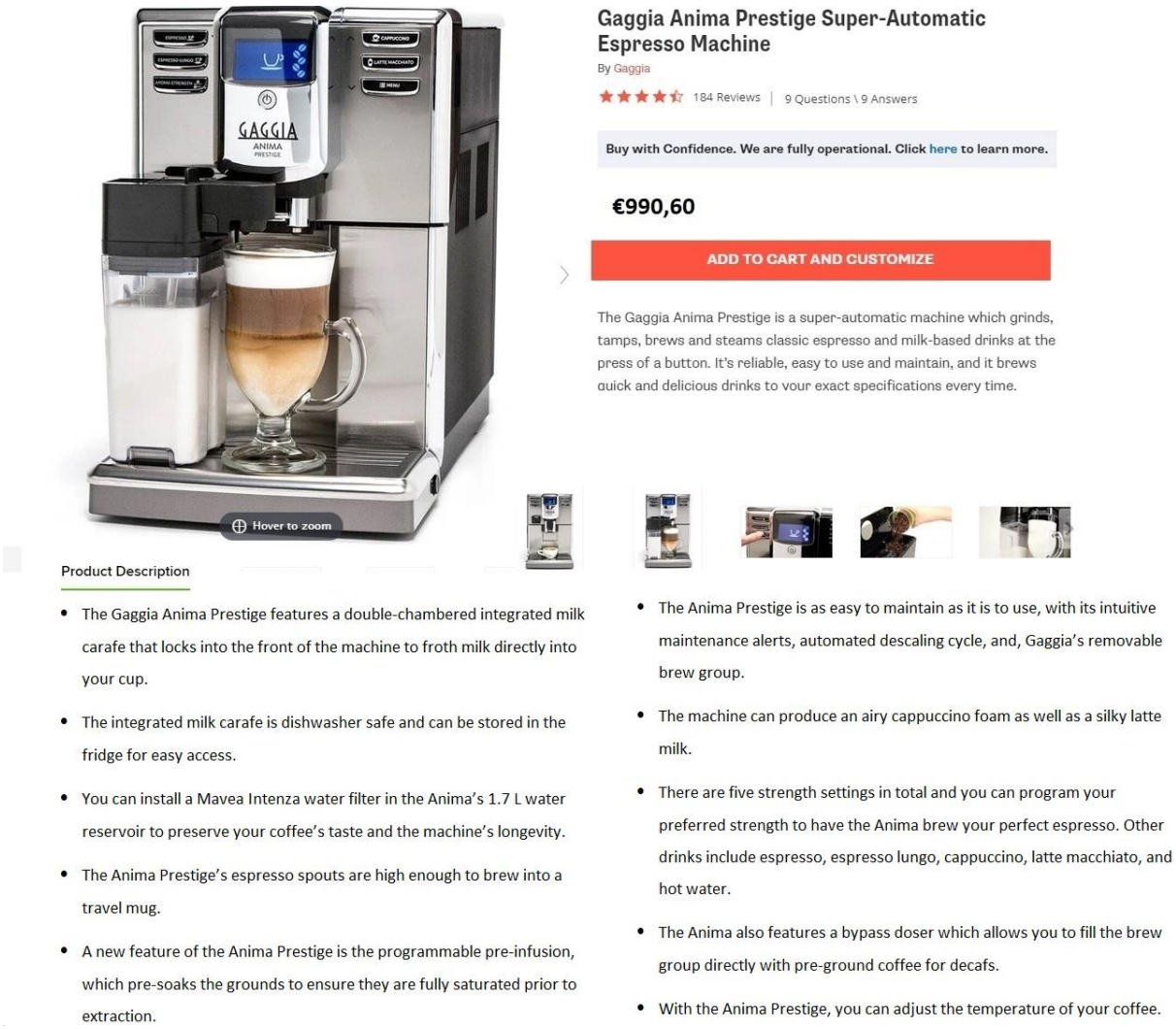


End of Block: Condition2

Start of Block: Condition1

Q26_BriefingCON1 Your old coffee machine broke down, therefore, you are searching online for a new coffee machine. Finally, your attention is drawn to the coffee machine depicted below and you decide to have a closer look to better evaluate price and functionalities. (Note: Please, rotate you screen, if you cannot zoom in on the image).

Q27_Image_HFHP



End of Block: Condition1

Start of Block: Variables

Again, please imagine that you are searching for a new coffee machine and that you are interested in the coffee machine you just saw

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Performance_Risk To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Based on what I have seen, I would expect that there would be a large chance that the product would not perform as it should (1)	○	○	○	○	○	○	○
Based on what I have seen, I would expect the coffee machine to fail because it has too much functionalities (2)	○	○	○	○	○	○	○
Based on what I have seen, the coffee machine, would, in all likelihood, need a lot of maintenance overtime (3)	○	○	○	○	○	○	○
Based on what I have seen, the perceived risk of product malfunctions would be too high (4)	○	○	○	○	○	○	○

Based on what I have seen, the coffee machine would not be able to deliver the anticipated benefits (5)	○	○	○	○	○	○	○
Based on what I have seen, the coffee machine would likely not perform to my satisfaction (6)	○	○	○	○	○	○	○

Financial_Risk To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Based on what I have seen, I would not like to risk to lose money on this coffee machine (1)	○	○	○	○	○	○	○
Based on what I have seen, I would perceive the financial risk of this coffee	○	○	○	○	○	○	○

machine as too high (2)							
Based on what I have seen, I would say that this coffee machine is affordable. (3)	○	○	○	○	○	○	○
Based on what I have seen, I would be concerned about the high financial risk of the coffee machine (4)	○	○	○	○	○	○	○
Based on what I have seen, I would not purchase this coffee machine because the product is too expensive (5)	○	○	○	○	○	○	○

Purchase_Uncertainty To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Based on what I have seen, I would be able to make a thoughtful decision to purchase this coffee machine (1)	○	○	○	○	○	○	○
Based on what I have seen, I became knowledgeable about this coffee machine (2)	○	○	○	○	○	○	○
Based on what I have seen, I would be hesitant to purchase this coffee machine (3)	○	○	○	○	○	○	○
Based on what I have seen, I did gain enough information to be certain about purchasing this coffee machine (4)	○	○	○	○	○	○	○

Purchase_Intention To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I would consider purchasing this coffee machine (1)	○	○	○	○	○	○	○
It would be nice to have this coffee machine at home (2)	○	○	○	○	○	○	○
This coffee machine appeals to me (3)	○	○	○	○	○	○	○
I like the design of this coffee machine (4)	○	○	○	○	○	○	○
This coffee machine would likely be the one for me to own (5)	○	○	○	○	○	○	○

Satisfaction To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Based on what I have seen, I would be satisfied about the way the coffee machine is presented to me online (1)	○	○	○	○	○	○	○
Based on what I have seen, I would say that the way the coffee machine is shown on the website is excellent (2)	○	○	○	○	○	○	○

Page Break

Evaluation_PF To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Based on what I have seen, I would be able to make good evaluations of this coffee machine. (1)	○	○	○	○	○	○	○
Based on what I have seen, I would be able to thoroughly evaluate this coffee machine (2)	○	○	○	○	○	○	○
Based on what I have seen, I would be able to elaborately asses this coffee machine (3)	○	○	○	○	○	○	○
Based on what I have seen, I would say I have a good understanding of this coffee machine's benefits (4)	○	○	○	○	○	○	○

Online_Involvement To what extent do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Based on what I have seen, I think that I would feel engaged during the purchase process (1)	○	○	○	○	○	○	○
Based on what I have seen, I think that I would like to try out all the features this website offers to interact with the product (2)	○	○	○	○	○	○	○
Based on what I have seen, I think that I would to feel involved during the purchase of this coffee machine (3)	○	○	○	○	○	○	○

End of Block: Variables